

Legal & market infrastructure for technology-driven firms

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Preface and acknowledgements

This study was undertaken during a period of economic crisis, an event that was also visible in the domain of technology-driven firms that needed to attract capital and other resources to secure their growth and sometimes even their existence. Being able to attract external capital is of major importance for innovative firms, as they may experience multiple years where income from sales is non-existent or simply insufficient to grow organically.

Therefore, it would be an exaggeration to blame the legal framework for all the difficulties that such firms may experience during their growth. Nonetheless, the legal framework is of major importance for fostering the long-term relationships between such firms and other necessary counterparties like financiers, industrial partners and sources of technology. For this, this study hopes to identify inadequacies in the legal infrastructure, and hopes to formulate improvements. At least, with this study I hope to create an improved understanding. In fact, I hope to serve a practical necessity, instead of merely an “academic luxury”, with this study.

Instead of a more traditional discourse, with detailed discussions of some regulatory or legal situations in isolation, better known as “black-letter law”, this research tries to look at the broader picture of the (eco)systems where technology-driven firms play a role. Also, the rules that impact and potentially dictate an industry should not necessarily be considered as static. After all, we can change the rules. However, that may certainly not mean that we can use rules to “plan” innovation, as we always have to understand that we don’t know what the dead hand of unintended consequences will change in a complex system. But understanding what influence a legal infrastructure has on structures and processes in a specific ecosystem, is very important. Research outcomes from other domains will be used to understand these mechanics in these ecosystems, and especially the role and mechanics of coordination structures will be considered. Ultimately, this should lead to recommendations for a more adequate legal infrastructure to foster such coordination structures where firms can match and contract with investors and with other firms.

This study is analytical instead of empirical. This also avoids the discussion about the validity of empirical data for future situations. After all, empirical data in social domains is observational, and not experimental as in natural sciences, and quantitative or econometric conclusions can never be verified with the same level of certainty like in natural sciences. This study will have a holistic approach or perhaps a “zoomed out” perspective, by considering different and disconnected legal domains where technology-driven firms participate – but where the same transactional principles can be applied to ultimately come to a form of analytical coherence.

Given the holistic view that is used in this research, the research will also take paradigms into account that have recently (re)emerged in society and innovative industries: namely ones that are based on collaboration and open innovation. This is in contrast to strictly competitive paradigms, or paradigms that are based on monopolism and hierarchical instructions. A trend exists where independent and sometimes small agents (firms, investors, etc.) work together to reach common goals. This cooperation or coordination of independent agents may lead to better and more efficient results

than monolithic agents may otherwise realize. This may however require other legal infrastructure and real infrastructure (coordination infrastructure in particular), than the one that was required for hierarchical entities. Of course, that does not mean that hierarchical structures should not be important anymore.

After an introduction, the different parts of this research will each time start with short legal and/or ecosystem history in a domain, to understand what market failures in that domain exist and how the lawmaker has addressed them. But this often led to an entrenchment of agents, structures or procedures that may now lead to inadequacies, especially for coordination mechanisms. Therefore, I will each time discuss a recent market-driven innovation that also tackles modern market failures –often through some form of coordination– but that will often demand other forms of support from the law. It will even be demonstrated that these innovations face substantial structural implementation problems in the existing legal infrastructure. Some legal barriers will be discussed, and some recommendations will be formulated. The three parts in this research for which this three-fold discussion will take place, are the ecosystem for matching firms with investors, the governance of the investor-investee relationship, and the matching and contracting environment for access to non-financial resources.

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Preface and acknowledgements.....	3
Introduction	10
Part 1: Theoretical framing.....	22
1. More specialization & relationship-driven inter-firm interfaces	23
1.1. From a pre-industrial to an industrial business landscape	23
1.2. The first and second industrial revolution: mass production of standardized products & scientific management.....	24
1.3. 21 st century: customized products, with fast product cycles, in a knowledge industry	25
2. Hazards and costs in transactions with technology-driven firms.....	27
2.1. Resources with a high degree of counterparty dependency, and external uncertainty.....	28
2.1.1. Capital.....	28
2.1.2. Technology (possibly innovative technology).....	29
2.1.3. Knowledge (possibly innovative knowledge).....	29
2.1.4. Reputation / signaling of legitimacy	30
2.1.5. Commercialization: marketing, distribution and supply	30
2.1.6. Innovative entities.....	30
2.2. High transaction costs, and the role of embeddedness in networks and communities.....	31
2.2.1. Search costs related to identifying counterparties	31
2.2.2. Trust building & selecting – potentially through contract costs.....	32
2.2.3. Monitoring costs	36
2.2.4. Enforcement costs.....	37
2.3. Market incompleteness.....	37
2.4. Collective action costs and coordination surpluses	38
2.4.1. Type I: bonding to create a conducive environment.....	41
2.4.2. Type II: bonding for better coordination	42
3. The interest in high tech firms in the broader context of society	43
3.1. Different positive societal systems, and different roles for technology, entrepreneurship and innovation	44
3.2. The introduction of an endogenous role for technology, innovation and entrepreneurship in economic growth theories	46
3.2.1. Neoclassical economics and the recognition of technological advancement as a factor	49
3.2.2. Schumpeter, creative destruction, and the recognition of entrepreneurs	50
3.3. Evolution of government intervention, with a recognition for technology, entrepreneurship and innovation	51
3.3.1. Prevention against negative externalities (Smithian inspired).....	51
3.3.2. Prevention of market failures, to reach positive externalities.....	52
3.3.3. Direct wealth creation and redistributors to fuel growth (Keynesian).....	55
3.3.4. Indirect fostering transactions and experimentations to fuel growth (Schumpeter, institutional economics).....	56
3.4. Understanding the dynamisms of technology and innovation.....	57
3.4.1. Non-linearity, complexity and uncertainties	58
3.4.2. Government's role in increasing the science base, R&D, innovation and adoption....	60
3.4.3. The role of entrepreneurs in disruptive innovation.....	61
3.4.4. Industrial dynamics	65
3.4.5. Market entry dynamics	66
3.4.6. The notions of radical and incremental innovation, and breakthrough technologies ...	68

3.4.7. The case of specialized service providers, instead of product market players	69
3.5. Technological advancement and the individual, societal and economic advancement.....	70
4. Costs, failures and inadequacies from governmental actions	72
4.1. The overhead cost of collective decision making: public choice theory.....	72
4.2. Failures in proactive rulesetting: political economy, misaligned incentives, pressures and bounded rationalities.....	73
4.3. Reactive rulemaking: discontinuities and path dependencies of rule- and lawmaking.....	75
4.4. Indicators of legal failures	76
4.5. Law- and policymaking as a demerit good?.....	77
4.6. Lawmaking to accept market innovations and legal pluralism	77
Part 2: Searching and contracting for financial resources with large pools of counterparties, hindered by high regulatory thresholds to use or develop coordination mechanisms.....	80
1. Coordination over individualism: open capital calls, and standardized contracts to deal with large groups of opaque investors	81
2. Historic co-developments of securities regulations and intermediated market infrastructure	83
2.1. Emergence of open capital calls and their regulations	83
2.2. Emergence of intermediaries and mutualized institutions	94
2.3. Emergence of securities processing providers (custodian banks, clearinghouses), and their intermediated access.....	99
3. ICT lowers the cost of coordination mechanisms, but faces regulatory barriers.....	104
3.1. Regulations that hinder open calls in the internet age	104
3.1.1. Country-specific differences & cross border complexities.....	112
3.1.2. The problem of inadequateness of prospectuses	122
3.1.3. The importance of alternative investment objectives	124
3.1.4. A market for disclosure rules, better exemptions & SME prospectus?	125
3.1.5. Startup firms and trade-disabled company units	126
3.2. The struggles of conductive infrastructure.....	130
3.2.1. A first demand for regulatory changes, coming from electronification: the breakdown of listing and trading monopolies	132
3.2.2. Entrenchment of intermediaries: pre-trade liquidity consolidators and post-trade infrastructure members.....	141
3.2.3. Direct access internet-based platforms for primary & secondary equity trading....	142
3.2.4. Do upcoming legal interventions address government failures?	146
3.2.5. Quasi equity and the crowdfunding market infrastructure	148
3.2.6. Regulations that hinder conductive search-only infrastructure	157
3.3. The forgotten element: post-trade infrastructure	159
3.3.1. Two systems under company & property law	161
3.3.2. A trend to dematerialized shares instead of dematerialized registers	163
3.3.3. Duality between book-entry and company law ownership rights	166
3.3.4. Reducing coordination costs of cross-border settlement: T2S.....	169
3.3.5. Increasing competition for securities depositories	173
3.3.6. Conclusion: a double marginalization problem.....	178
4. Conclusions and recommendations.....	178
Part 3: Individualized contracting for financial resources, hindered by entrenched legal standard infrastructure for coordinated situations	182

1. Investor-firm relationship	184
1.1. The emergence of corporations and the equity investment instrument	185
1.1.1. The history of joint undertakings (companies).....	185
1.1.2. The history of jointly owned undertakings, with passive and active participants ..	186
1.1.3. The history of the jointly owned stock corporations, with hired management.....	188
1.1.4. The history of limited liability companies	191
1.2. Emergence of a mastery and anticipation of agency and self-interest problems ..	193
1.2.1. Social and market mechanism: trust, reputation, a lack of lock-in	194
1.2.2. Contractual mechanisms or company charter provisions.....	195
1.2.3. Publication of privately designed mechanisms and standards	197
1.2.4. State provided mechanisms.....	198
1.2.5. Role of state provided judicial enforcement.....	200
1.2.6. Listing rules and stock exchanges requirements on one-sided adoption of mechanisms	201
1.2.7. Conclusion: shareholder supremacy.....	201
1.3. Mastering misalignments between investors / shareholders	203
1.3.1. Controlling mechanisms through government-provided rules.....	204
1.3.2. Controlling mechanisms through judicial enforcement	205
1.4. Beyond debt and equity: revenue sharing, and a suitable role for unincorporations.....	206
1.4.1. Revenue sharing arrangements in the continuum of hybrids between debt and equity	209
1.4.2. The debt-equity continuum in a fiscal and accounting world.....	211
2. Investor-investment manager relationship	219
2.1. Emergence of managed venture capital investments.....	220
2.2. Managing the risk for managerial opportunistic behavior	224
2.2.1. Through reputation and social sanctions.....	225
2.2.2. Through contracting.....	226
2.2.3. Regulations to increase confidence in funds and management, and to avoid systemic risks	228
2.3. Unbundling the services: pledge funds, deal-per-deal fundraising, à-la-carte services, investor involvement	230
3. Conclusion	232
Part 4: Searching & contracting for non-financial resources: coordinating to build conductive infrastructure for individual partnerings, and coordinating to overcome accumulation of individual partnering costs	234
1. From contract law to conductive market infrastructure to foster partnerings	236
1.1. Evolution of contract law.....	239
1.1.1. Classical – assumption of complete contracts.....	239
1.1.2. Neoclassical: recognizing incomplete contracts	240
1.1.3. The concept of good faith	241
1.2. Increasing contract complexity	242
1.2.1. Intellectual property aspects of a cooperation	242
1.2.2. Ex-ante licensing term transparency, and standard licenses.....	244
1.2.3. Opportunistic hazard controls & continuously governed contracts	245
1.2.4. Monitoring design	247
1.3. Contract law limitations force a focus switch to trust networks, communities and infrastructure.....	247
1.3.1. The role of trust.....	248
1.3.2. Overcoming the weaknesses of trust and social sanctions: platforms.....	249

1.3.3. A role for governments: sponsoring & fostering trust infrastructure	250
1.3.4. Case: triple helix public-private cooperation in Eindhoven and beyond	251
2. Overcoming transaction cost accumulation to access complementary resources by creating aggregation and standardization infrastructure.....	252
2.1. Patent pools and the problem of dependency and free riding	254
2.2. Cooperating to design standard licenses or technical standards.....	257
3. Conclusion	258
Conclusion.....	261
References	268

Introduction

A general research question of this study concerns the identification of inadequacies in the legal infrastructure, for transactions that technology-driven businesses undertake. The nature of those transactions, in combination with the characteristics of such firms, will allow fine-tuning this research question. Those transactions are typically costly (i.e. transaction costs for searching and selecting counterparties, for assuring oneself of the trustworthiness of the counterparty - as the opportunity cost of ex-post remediation may be prohibitive). Often, such transactions are non-anonymous and relationship-driven, in contrast to transactions that take place in a spot market. Additionally, technology-driven firms are typically limited regarding the resources that they can own and control. They are at least more limited compared to big and vertically integrated corporations. However, such big corporations were the standard when most of today's legal infrastructure was created, and the legal infrastructure may thus offer a better fit for such big corporation than for today's entrepreneurial and technology-driven entities. As today's technology-driven firms need to access more resources externally, they need to engage into more transactions. The large number of transactions that such firms need to undertake, moves our focus more away from individual transactions (and their costs) to the collective set of different transactions that such firms need to undertake. And more specifically, it moves our focus towards the cost accumulation that such collection of transactions brings. A level of coordination between transactions can prevent that such individual costs become prohibitively expensive. Those forms of coordinated or collective transactions will be the core of this study. Sometimes, the legal infrastructure will offer coordination mechanisms, but often in a form that is inaccessible or too rigid for small technology-driven firms. This may justify some intervention. Sometimes, legal intervention may be necessary in domains that are not strictly transaction based, like tax law or intellectual property law. But not only the state provides coordination mechanisms. Also private mechanisms and infrastructures like conductive platforms or standard-setting bodies may lower the cost of transacting. Such coordination mechanisms may in some cases merely require some form of government sponsorship or legal support.

In a first theoretical part, this study will mainly consider some recent trends in the economy and industrial organization, to better understand technology-driven businesses and the nature of their transactions. These trends are for instance the globalization of markets, the higher importance of knowledge in our quickly moving and innovation-driven economy, the presence of interfirm interfaces which are less based on discrete goods, an omnipresent role for IT, and a trend towards more specialized entities instead of big corporations. Our legal infrastructure has a large number of elements that result from earlier industrial cycles, and which may not be fully adapted to the new realities – despite its fitness under the older paradigms. Legal infrastructure is plagued by its path dependency and lags behind more recent innovations. It is heavily biased and generalized to the trends that started with the first industrial revolution, and it still considers a very homogeneous reference unit (namely the competitive big corporation – instead of the collaborative specialized entity).

Governments realize the societal surplus that the prevention of market breakdowns may offer, and try to implement all sorts of lawmaking and policymaking to improve the market functioning. After all, thriving firms prove to be a vector for social welfare in a region. Also, technology-driven firms are a vector for technological advancement, which is also a vector for human advancement. Governments therefore have an interest

in fostering such firms. However, governments also play a direct social welfare role to protect individuals instead of merely advancing the group. This may create conflicting interests, and a need to find a balance between collective and individual interests – or simply to set priorities. In a globalized world however, the globalization for markets creates a normalizing pressure for governments that prevents them from overly protecting the individuals, as they may otherwise put whole regions or nations in a less competitive position in our quickly changing globalized world. This will also be discussed in the theoretical part.

Besides realizing that it may boil down to balancing priorities, understanding the (in)adequateness of legal infrastructure demands however some understanding of the innovation domain, in order to understand the limits of governmental actions, and to understand that actions that worked under other economical paradigms, may not work today. Despite this, politicians may have all sorts of incentives, and systemic or human limitations that may still let them opt for inadequate measures. Also, measures that worked well under previous economic settings to reduce transaction costs may now lead to an increased transaction cost as the legal and regulatory framework is sometimes nothing more than a constraint rather than a facilitator. What was once intended as a remedy against a market failure, can also become a government failure.

A particular type of market failure for which the (lack of) legal infrastructure will be discussed, is thus coordination failures. Especially in today's economy with many small independent entities, many forms of coordination offer superior social welfare effects compared to competing firms. This is different from a landscape with only large corporations. Two types of coordination will be identified in the theoretical part. Those types will also return in the parts thereafter. Firstly, I identify conducive infrastructure (possibly the result of collective actions, but it may also be on a commercial basis) to make the many transactions between the members easier (i.e. in terms of lower search costs, better means to assess the trustworthiness of counterparties, and lower contracting costs). Secondly, I identify collective actions to set standards that facilitate the interfaces between firms that need to cooperate heavily.

To obtain a holistic view, and to come to analytical coherence, the study works on different transaction settings and legal domains, each time with the same mindset. I will try to avoid an overly disconnected approach between different domains that are often treated in a disconnected way. It will thus connect domains that may lie scattered. For instance, venture capital, public equity markets, markets for technology and collaboration, etc. are often perceptually too disconnected. This research tries to avoid this disconnection, and aspects of multiple legal domains may be touched in this study:

1. Aspects of securities law (in part II)
2. Aspects of tax law and accounting law (in Part III)
3. An aspect of intellectual property law and antitrust law (part IV)
4. Aspects of contract, company and partnership law (in Part II, III and IV)

This does of course not mean that all the domains that will be touched would be covered in great depth. Other studies are better for that. Also, not every legal domain of importance to the development of high-tech and high-growth companies will be covered. An illustration may be covenants not to compete: their role is generally

understood to be of influence, especially for the creation process of new firms by workers that leave existing high tech firms. I will however not discuss this domain. Despite that I will highlight later that this “birth giving” process is actually a dominant model under which high tech firms emerge (except perhaps for IT related business where the low capital requirements allow to start even by youngsters).

After the theoretical introduction, the different chapters of this research will each time start with a short legal and ecosystem history in a domain, to understand what market failures and transactional failures exist(ed) in that domain, and how they have been addressed. This often resulted in entrenching structures and market practices that are not fully adequate for today’s firms and circumstances. Then, every discourse will be followed by a discussion of a recent trend or demand in the market, potentially the desire to create a system to solve coordination problems, but which may face substantial structural implementation problems under the existing legal infrastructure. These legal barriers will be discussed, together with a recommendation that should allow enriching the legal infrastructure in a way that also accommodates new economic needs. The three applied parts in this research for which this three-fold discussion will take place, are the infrastructure for matching firms with investors (*ex-ante*), the governance of the investor-investee relationships (with the investee discussed from the situation of a firm and a fund respectively), and the partnering environment for interfirm alliances with a high degree of dependency.

The second and third chapter will look at the financing of firms. Individual financing transactions are recognized by mechanisms for anticipating hazardous and opportunistic situations, by mechanisms for continuous monitoring of the alignment, and by mechanisms for enforcing potential misalignment. Indeed, the long-term dependency that may exist between transactional parties makes them subject to many external uncertainties, as well as opportunistic hazards and poor performances, which are difficult to observe. Already upfront, the difficulty to differentiate between the quality of potential counterparties can lead to adverse selection and ultimately to market breakdown.

The second chapter of this study will therefore focus on a number of *ex-ante* aspects in the financing of firms – all with a collective instead of bilateral component. A first sub-aspect will be the promotion of investment opportunities to a large crowd of potential investors. Second will be the creation of conducive market infrastructure where investors and investees can flock to for promotion and contracting. Third will be the coordination of market infrastructure that keeps track of ownership stakes in firms. For those aspects, I will discuss how much the existing regulatory framework influences the ecosystem that is in place today:

- For the first sub-aspect, the coordinated promotion to an unidentified crowd, lawmakers implement a number of *ex-ante* flows of information to externally enforce trust (or at least the implement sanctions and third party enforcement to create a cost for lying), in order to prevent market breakdown and to supplement the signaling that firms may automatically undertake. Otherwise, adverse selection may exist when investors start to anticipate the presence of bad quality firms by assimilating all firms as bad quality firms. However, law- and policymakers also have a more paternalistic motivation: namely to protect individuals from risks that equity investments may bring (namely a potential to

loose the entire investment). The result is a set of restrictive promotion regulations that hinder the access to finance for firms, as those are forced into non-collective but rather individualized transactions if they want to avoid the prohibitive compliance costs. These regulations are so prohibitively costly for small technology-driven firms that they may not be able to address the crowd and that they are therefore forced to the network-driven promotion. This is less regulated as lawmakers expect that parties may have enough bargaining power or knowledge to reassure the trustworthiness or that the embeddedness of the communications in social trust networks may act as trust mechanism to prevent market breakdown. However, finding potential investors then comes at a high individual search cost (a component of the total transaction cost) and he may not be part of the reach of such network and may potentially not be reached. Also investors may never get to know about potential dealflow if they don't manifest themselves publicly or if they are not in the right social network. A substantial dichotomy between public (coordinated) and private (individual) placements thus exists – but given the possibilities of the internet to reach large crowds at low search costs, this may not be adequate anymore today.

- A similar problem is true for the second sub-aspect, namely for market infrastructure providers that can bring investees in touch with a large pool of investors, in a coordinated way. I will discuss the trends in conductive platforms to reduce search costs, and perhaps also contracting costs (in case also standardized online investment contracts are offered). The existing ecosystem that originally facilitated the placements of investments to the public at large is the system of stock exchanges. But it has a strong interest of brokers – intermediaries that as a group often enjoy exclusivity of offering access to centralized supply and demand and consequent network effects. The regulatory systems largely co-evolved with the emergence of that intermediated system. The regulatory system entrenched this intermediated system, and both this market system and the regulations evolved towards an infrastructure that is mainly conducive for secondary trades but not for primary fundraisings. Now, these regulations also offer much resistance against innovations that experiment with this ecosystem, especially under the form of internet-based platforms. Crowdfunding and investor matching platforms want to offer the type of disintermediation that other markets have experienced since the emergence of the internet. But mix of promotion regimes and investment services regulations severely limit the possibility to create such platforms. Especially differences in interpretations or national laws create a fragmented market and a level of legal uncertainty when cross-border access is offered. This approach is very restrictive and hindering for the possibilities that the internet brings in settings to address a large audience of invisible but potential counterparties. Also, Europe lacks a system that could coordinate between such emerging infrastructures (i.e. by means of standardization), to reduce the potential for fragmentation.
- A third sub-aspect is the domain that keeps track of shareholder ownership. As a juxtaposition on top of company law rules, there are market practices that work with central securities depositories and electronic shareholder registers. A problem is however the heavy path dependent situation. Connecting to such central securities depositories often requires the use of one or more intermediaries. Also, every country had its own central infrastructure, which

thus creates much duplicate costs but also many accumulations of connection and membership costs. The market didn't solve this problem organically, and the European Central Bank and the European lawmakers came with two compatible initiatives to coordinate between the different and often disconnected central infrastructures and to lower the connection costs for the respective member-intermediaries (and ultimately end-investors). However, this coordination effort does not lower the accessibility threshold for small technology-driven issuers. For small firms, a cheaper system based on electronic dematerialized registers might be interesting but the new initiatives do not facilitate that.

The third chapter, will still be in the financial domain, but now rather be ex-post. Given the technology-driven firms that will be considered, it will deal with equity investments. One of the typical features of high tech companies is the general necessity to rely on equity financing, instead of debt. Debt is a liability and failure to repay debt can create a right to invoke bankruptcy. Due to the external (exogenous) risks and uncertainties under which a technology-driven firm operates for a very long time, a residual payoff instrument is better suited. On the other hand, an equity holder puts himself in a dependency position vis-à-vis the manager-entrepreneur and perhaps also his co-investors who can potentially expropriate wealth from him. The equity's return potential will depend on external uncertainties at the operational side of the company, but also on potentially opportunistic risks and poor performances of those manager-entrepreneurs. To anticipate those hazards, contractual mechanisms can be foreseen together with the use of other mechanisms (i.e. reputational mechanisms, markets for control, industry developed corporate governance standards, etc.). But also lawmakers have foreseen mechanisms to combat moral hazards, through providing standards in company law. Those company laws provide a mix of default and mandatory rules – the latter are often rather related to the limited liability feature that is associated with some structures and where some lawmakers prefer to maintain a number of buffers (i.e. minimum capital requirements as still present in a number of jurisdictions, two-tier boards, voting rights) in order to safeguard individuals that contract with such firm or that invest in such firm but that would not have individual negotiation power. This is especially the case when a large public of investors is used. These state-provided standards thus solve a coordination problem somehow, in a setting where individual negotiations with a large crowd of investors would be prohibitively costly. But the venture capital and private dealmaking practice has however always relied on customized deals. That seriously increased the power of such shareholders – often to an extent that can be called shareholder supremacy. This reinforces the typical agency theory, which was especially appropriate in times of the traditional industrial companies where the capital providers were the most important actors and where the hired managers were merely some sort of commodity to perform quasi-routine scientific management tasks. But in today's innovative businesses, it is less suitable as the idea-provider (the entrepreneur) is also important and unique and not a hired actor that performs a routine task. However, irrespective of this theoretical reflection, the customized practice is heavily hindered by the standardized system that is included in corporate laws. Thus, the good intentions to offer a coordination mechanism actually hinder situations where the parties want a more customized and individual approach. Two sub-settings will be described:

- I will discuss the case of fully customized investment instruments that have properties of both equity and debt (the latter has less room for opportunistic hazards as the repayment isolates one from dependency on such risks) and who offer revenue sharing properties. Those hybrid or structured instruments can partially solve problems like difficult valuation, the dependency on secondary markets, the risk for opportunistic hazards, etc. Such contracts may also better suit an idea whereby the entrepreneur is an important element of the company and not just someone who routinely operates under a mandate or contract for the shareholders-principals. Due to their full customization, these investment instruments bring the benefits of partnership structures under the attention, in contrast to corporations, as partnerships offer full flexibility. However, partnerships are not supported to the same extent as corporations, who have become the gold standard in many jurisdictions. Other researchers have covered this. But an equally large problem is the polarized and standardized approach of investment instruments in fiscal and accounting rules, which only recognize debt and equity (and royalty payments on intellectual property licenses). This creates substantial uncertainties regarding the classification of such customizable instruments that have properties of both debt (obligatory repayment) and equity (residual repayment). That will be discussed.
- Then, the rest of the third chapter will consider the moral hazard situations in the relation between investors and venture capital fund managers. This risk for self-dealing is there even increased through the standard fee structure in that industry. Even if investment agreements include a number of provisions to protect against self-dealing and misalignment of the fund managers. However, recently, those protections increased due to weaker bargaining power of many fund managers. Investors withdrew from this market, or often demanded alternative terms now – in order to obtain better alignment. This also led to more interest in alternatives besides the typical blind pool model, where fund managers have full power over any element from deal sourcing, selecting, due diligence, deal term design and post-investment management. Possible alternatives can exist under the form of different unbundled services towards investors. For instance, pledge funds that do the deal sourcing, due diligence, deal term design and post-investment management – but where the investor enjoys discretion over participating or not. Such arrangements can easily be agreed on in the partnership agreement if a fund is organized as a partnership. But many continental European countries do not often use this model for an investment fund, and rather use a corporation. Thus, it is again a setting where a structure is used that actually solved a coordination problem when many small parties are involved for which the accumulation of individually negotiated transactions would be prohibitively costly, in a setting where individually negotiated transactions are actually wanted. I will shortly illustrate this with the problem case of a pledge fund with multiple portfolio firms – but where individual investors retained control over the size of their participation per portfolio company. But the return flows cannot easily be linked to particular shareholders in a corporate structure. Therefore, I will discuss the suitability of entity types like umbrella funds or segregated cell companies.

A fourth and final chapter will however move away from the traditional idea that technology-driven firms only develop through the injection of external capital. Such

firms also benefit from access to other complementary resources that they cannot or do not want to own. Collaboration with other firms to reach for a mutual goal is key (instead of competing with them). The risk for opportunism will now rather exist out of other forms or self-dealing (still moral hazard situations). For instance, competitors in a joint venture that expropriate knowledge to increase one's capabilities but that then lower the attention to the joint venture goal. Another market failure that will potentially be very outspoken is the dependency on the counterparty that can create holdup situations (i.e. asset specific investments). This is a failure that also impacts collective settings, and not only bilateral settings. Indeed, the types of coordination that were already discussed in a financial context can again be discussed in the context of partnering – namely to create conducive infrastructure to make transactions easier for members, or to create standard interfaces between member. I will thus discuss two cases where collective efforts improve the partnering between firms:

- A first sub-section will discuss collective infrastructure to improve search and contracting. I will discuss how contract law has come under stress to accommodate long-term contractual relationships, in contrast to rather instant handoffs around products for which classical contract law was optimized. The unforeseeable situations in a long-term contractual alliance are accommodated through the theory of incomplete contracts, and notions of good faith. However, the high opportunity cost that such long-term alliances create may let parties prefer ex-ante assurance of the trustworthiness of the counterparty instead of having an ex-post remediation right. Besides the threatening ex-ante role of contractual/legal sanctions, non-legally created trust is still a very important element, despite its extralegal or self-reinforcing nature. Also, the interplay between trust and using a contract offers mixed results: a contract can harm the trust between parties, or it can increase the trust between them. Therefore, this difficult accommodation under today's contract law will be discussed and instead of fixing that through suggesting more law, specific attention will be given to the case of market infrastructure instead of legal infrastructure to let potential parties better connect with each other and to assess the trustworthiness. This can be through specifically created (and potentially government-sponsored) platforms or through organically grown communities that also have a search cost reducing function like the internet platforms that were discussed in part two. The problem to form such communities or platforms, will now rather be a coordination problems or a collective action problem, rather than the existence of legal obstacles. If a commercial opportunity is present, then a lead party can step in to convince members to joint – but this can be difficult without critical mass as the value depends on network effects. Because of this potential coordination failure, it may well be that the government can have a useful function to provide or to sponsor such platforms or communities to overcome such failures, instead of focusing on lawmaking or on contract law alone.
- A final sub-section will also discuss another coordination effort: namely in the domain of intellectual property. Artificial monopolies under the name of intellectual property create incentives to innovate – as property over a non-rivalrous and non-excludable element like knowledge proves to be the strongest incentive to overcome the public good nature of information and knowledge. However, these monopoly rights also create a potential for excessive rent-seeking given the dependency that some agents may have on that unique

intellectual property. This can create holdup risks. Intellectual property law is therefore a constant balance between giving more monopoly rights, or giving more rights to free usage. Today, as knowledge is more important and as firms are less and less able to possess all required knowledge in-house, there is an emerging need to let technology be accessed by different firms. There is a reality that a single firm may need to source licenses from a large number of firms – and the lack of a coordinated arrangement can result in a prohibitive compound of transaction costs. When a large number of licenses need to be obtained, privately created infrastructure emerges that pool intellectual property families together, in order to offer them as one set of licenses at heavily reduced transaction costs. A large group of otherwise individual transactions is thus replaced by one cost-effective standard contract. Such pools often combine their function with some other sort of standard setting, namely to push the technology in the pool as a technological standard. Such technological standard then reduces the interface between different decentralized firms that can make components that just comply with the standard rather than with individually negotiated characteristics. However, under the existing intellectual property law infrastructure, such private transaction cost reducing systems like patent pools (often also as standard setting organization) are still exposed to the risk for holdup from key intellectual property holders who see bargaining power increasing thanks to the effort of such pools (namely the increased use and adoption of the technology – and thus a greater number of firms that will become dependent on the unique intellectual property). I will describe how lawmakers can have a role through adjusting some principles in intellectual property law or antitrust law. However, I will not go into detail as other more specialized authors also hotly debate this. Instead, I rather highlight this topic to draw parallels with other parts in the study and thus to reach analytical completeness.

Finally, in a last part the overall conclusion will thus be that the legal framework is largely inadequate for some trends in society, and especially for businesses in the high-tech and high-growth domain. Especially for market infrastructure providers - infrastructures that facilitate a conducive setting between users (with distinct network effects) merit a supportive legal environment. But also the support of private standard setting, or the fact that states should avoid to force certain standards, is highlighted.

The methodology of this study will be analytical, and suggestions and recommendations will be the result of an attempt to reach analytical coherence. This study will not follow empirical research methods. I will however follow a holistic view, and I will also use the lens from other domains like economics, finance and industrial engineering (value chains), together with the use of problem observation techniques that are less shaped by hegemony in one domain. This study does not want to prove knowledge on a particular domain of the law and law is thus not justified in its own terms. This should inspire the potential for legal change instead of isolating lawmaking from economic and social changes, resulting also in path dependency.¹ Law is and was often considered as a

¹ Alan Watson, 'Comparative Law and Legal Change' (1978) 37 *The Cambridge Law Journal* 313.

² Brian H Bix, 'Law as an Autonomous Discipline' in Mark Tushnet and Peter Cane (eds), *The*

separate and autonomous discipline², but staying within the mindset of one discipline can also very easily blind.³ We should certainly remember that law scholarship should serve an important social function. It is better to recognize this subordinated function, instead of justifying it in its own right, or instead of serving internal discussions that are ultimately competitions for hegemony by different groups of legal elites.⁴

Especially in Anglophone jurisdictions, there has been an animated discussion in the recent years, roughly since the 1970s, to bring this sense of realism to legal scholarship and law schools. But in European and especially civil law countries, many legal texts still merely describe the state of a legal domain, by mentioning cases, recent legislative developments, etc. These are excellent for practitioners that need to find out about a particular field of the law, but it is particularly hard to consider this as original contributions to a field, or to how conceptual thinking should or could change, like what is expected in other academic domains. This research will therefore aim to think about what law should or should not become, instead of summarizing what it is. It will not have a function to guide courts, as they decide cases.

Legal issues will thus not be put ahead of business issues, and assumptions that are or were used to structure normative legal arguments, may be reconsidered. This study also intends to serve societal or industrial enrichment that is communicated back to that industry for testing.⁵ It does not only request acceptance among peers.

Law (or the legal infrastructure) should be considered as a platform where private parties can build applications, and not an application in itself. Market-driven initiatives will thus receive a lot of attention in this study. A legal infrastructure should for instance be able to deal with new market-driven innovations that may emerge in the future, but that do not quite fit in existing systems. Citizens and market actors should indeed have the freedom to experiment outside vested structures and regulations that entrench such vested structures. This allowance for multiple paradigms and systems is an often forgotten property in legal infrastructure.

The research project was carried out in different steps, including background research, which was aimed at providing a substantial overview of the concepts involved, literature review and case studies. Also expert interviews were part of the research through face-to-face or telephonic semi-structured interviews or through interview guidelines that were developed on the basis of the desktop research results. In looking at different legal systems, and in undertaking interviews, the home bias was avoided as much as possible – namely the bias whereby legal systems are appraised through a

² Brian H Bix, 'Law as an Autonomous Discipline' in Mark Tushnet and Peter Cane (eds), *The Oxford Handbook of Legal Studies* (Oxford University Press 2005); Richard A Posner, 'The Decline of Law as an Autonomous Discipline: 1962-1987' (1987) 100 *Harvard Law Review* 761; Richard A Posner, 'Conventionalism: The Key to Law as an Autonomous Discipline?' (1988) 38 *The University of Toronto Law Journal* 333.

³ Stuart A Scheingold, 'Home Away from Home: Collaborative Research Networks and Interdisciplinary Socio-Legal Scholarship' (2008) 4 *Annual Review of Law and Social Science* 1.

⁴ Pierre Bourdieu, 'What Makes a Social Class? On the Theoretical and Practical Existence of Groups' (1987) 32 *Berkeley journal of sociology* 1.

⁵ For such evolution in research, see: Michael Gibbons, *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies* (SAGE 1994).

“hidden benchmarking” with the home legal system.⁶ For that reason, extralegal factors such as trust or real market infrastructure also have a prominent role in this study.

⁶ Mathias Siems, ‘What Does Not Work in Comparing Securities Laws: A Critique on La Porta et Al’s Methodology’ (2005) 16 *International Company and Commercial Law Review* 300.

Part 1: Theoretical framing

This part will take a high level view to situate the study. This theoretical part does therefore not advance the state of the art of any particular field. At most, it enhances our perspective by connecting some different fields.

I first sketch the business landscape under today's business conditions. Then I explain today's challenges that technology driven firms face when they enter into transactions. This part will therefore introduce the thinking of the following parts, which considers firms and transactions as resource-based. Those transactions are considered under a transactions cost framework. Parties, private initiatives and governments can do many things to reduce these transaction costs. Both extralegal as well as legal mechanisms may allow lowering those costs. And external conditions may sometimes disallow to lower those costs below a certain level.

Finally, I explain why governments have an interest in fostering conditions for technology-firms. This part ends however by explaining how government intervention can easily incur failures as well.

1. More specialization & relationship-driven inter-firm interfaces

Today's commercial landscape is characterized by shorter product lifecycles, competition based on time to market and more demanding customers (or better served customers, who can just pick the provider that serves them first with an innovation that proves to be superior above other offerings).⁷ These are all interwoven with each other. A substantial enabler of this change was the emergence of ICT, which can be considered as a general purpose technology that shaped the functioning of an economy.

Previous industrial eras also often depended on general-purpose technologies that were available at that specific time. For instance, the initial industrial revolution at the end of the 18th century was possible thanks mechanical production facilities (water power and steam power). At the end of the 19th century, electrical energy would allow mass production through assembly lines, where workers could do very specialized actions under the principle of division of labor. Since a few centuries now, IT systems allow to further automate processes, but also to allow increasing the complexity (i.e. more tailored to the specific requirement set of the customer).⁸

1.1. From a pre-industrial to an industrial business landscape

⁷ Sameer Kumar and Promma Phrommathed, *New Product Development: An Empirical Approach to Study of the Effects of Innovation Strategy, Organization Learning and Market Conditions* (Springer 2005).

⁸ Wolfgang Wahlster, 'Industry 4.0: From the Internet of Things to Smart Factories' (3rd European Summit on Future Internet, Espoo, Mai 2012) 0
<http://www.dfki.de/~wahlster/Vortrag_SGAICO_Zuerich_27_05_13/Industry_4_0_The_Semantic_Product_Memory_as_a_Basis_for_Cyber-Physical_Production_Systems.pdf> accessed 12 August 2012.

In the pre-industrial era, there were no large corporations and interactions between small economic agents (often individual craftsmen) were around goods. The benefits of some form of coordination, or working together across such entities, were nonetheless already recognized. This happened through craft guilds.⁹ These closed communities have non-anonymous and face-to-face properties that did not allow them to operate on a large scale or over large geographical distances. Towards outsiders and other economic agents, such guilds could exercise some monopoly and cartel power. Their closed nature led to barriers to entry. However, the risk for being expelled from such closed guilds enhanced the attention to trustworthiness and reputation among the members. Innovations that resulted out of such collective institutions or from other institutions in the fifteenth and sixteenth centuries were the creation of standards for commerce (later evolving towards commercial law) and the creation of mutual institutions for encouraging risk-taking behavior (insurance pools).

1.2. The first and second industrial revolution: mass production of standardized products & scientific management

When technological progress allowed producing and distributing goods on a mass scale, large corporations that operated according to the principles of rational bureaucracy would overclass small producers.¹⁰ The production of cheap standard products could happen thanks to the benefits from economies of scale. At high fixed costs, and a large output, one could create low average costs. The central coordination of productive resources in a single producer was under those circumstances more competitive compared to decentralized small and independent producers. These economies of scale were also a barrier to entry as a minimum efficient scale to compete could be prohibitive. Complementary resources were exclusively owned and controlled by the large entities, instead of needing coordination or product handoff across different economic entities. Superior access to resources, offers a competitive advantage.¹¹ The high capital requirements to exclusively own resources could be met thanks to an innovation to pool capital from different individuals: corporations.¹² Such exclusively owned resources could be capital-intensive machinery, but also employees who then worked under long term loyalty for an employer and who performed very specialized and repetitive tasks (the division of labor notion). Those employees followed instructions under scientific management principles.¹³ Even marketing and distribution could be more efficiently integrated in such firms, instead of relying on independent wholesalers for it.

⁹ Sheilagh Ogilvie, “‘Whatever Is, Is Right’? Economic Institutions in Pre-Industrial Europe’ (2007) 60 *The Economic History Review* 649.

¹⁰ Laura L Koppes, *Historical Perspectives in Industrial and Organizational Psychology* (Psychology Press 2014).

¹¹ Gerald R Salancik and Jeffrey Pfeffer, ‘A Social Information Processing Approach to Job Attitudes and Task Design’ (1978) 23 *Administrative science quarterly* 224.

¹² James Stuart Olson, *Encyclopedia of the Industrial Revolution in America* (Greenwood Publishing Group 2002).

¹³ Koppes (n 10).

The highly abstract nature of the central and scientific (rationalized) management meant that individual customer-specific knowledge could not be used, or that it would not be able to travel the information ladder up to the decision makers. There was also no need for that as the low cost of the products was attractive, and as the market lacked competition from equally inexpensive but more customized products. Market shares were also protected through artificial measures like lock-in contracts or through brand loyalty. This mass production of standardized and cheap goods was a substantial difference against products that were produced and sold by craftsmen. Notions like monopolism are thus naturally related to such paradigm, as this is the pinnacle of economies of scale.

With the number of large firms (i.e. car companies) increasing, complementary economic agents and infrastructure also started to emerge. For instance transportation infrastructure, packaging technology or telegraph communication lines.¹⁴ Those had a reinforcing effect. Larger markets and mass produced products went hand in hand. And as production would be concentrated in the hands of a small number of large corporations, also the securities markets would evolve in conjunction with those corporations and the trading volume that concentrated around such set of firms. This lack of fragmentation, also allowed that investment intermediaries would undertake complementary value adding services for the select few large corporations, like investment research.

The inherent structure of the corporations also implied a competition between investors and those who were in control of the contributed capital, which became known as agency problems. Agency situations have demanded a great deal of our attention and energy, also in lawmaking. Besides corporate regimes, also other legal infrastructure has its origin under the industrial paradigms of mass production and separated ownership and control: competition law for instance, as well as contract law that concentrated on the trade of goods.

Law- and policymakers even continued to focus on the dynamics of those mass-producing institutions till many decades after World War II. They were also an easily observable factor in the economy as their number was limited and their size was large. At some point in time, these large companies created practically all the new jobs. However, since the late 1960s, they have mainly been responsible for the loss of jobs.¹⁵ The next title will illustrate how economic evolutions then favored small economic entities.

1.3. 21st century: customized products, with fast product cycles, in a knowledge industry

Recently, most sources of competitive advantage came not from static market share but from new technologies, new sources of supply or new types of organization.¹⁶ Faster

¹⁴ Ibid.

¹⁵ Hans Landström, *Entrepreneurship, Competitiveness and Local Development: Frontiers in European Entrepreneurship Research* (Edward Elgar Publishing 2007).

¹⁶ Joseph Alois Schumpeter, *Socialism, Capitalism and Democracy* (Harper and Brothers 1942).

product cycles allowed bringing products to market faster than competitors (and thus to take away market share). New production principles allowed to operate at lower prices than competitors, even in smaller batches, or allowed to bring more appealing products to customers. Innovating with technology gives thus more possibilities to fulfill the needs of individual customers or niches of customers – and to compete on that.

Also, the minimum efficient scale and fixed costs of many operations have significantly dropped. At the same time has there been a growth in population and income. And further advancements in transportation and telecommunication have resulted in further extended and globalized markets. Also protectionist measures have decreased, and free trade has increased. Services and knowledge have now an important role, and these elements are less physically and geographically limited than goods and physical assets.¹⁷

Small, agile and specialized businesses now dominate the landscape, and are also the major source of jobs.¹⁸ Large firms often experience more difficulties to behave in a responsive instead of a repetitive way or to reinvent themselves under the changing business dynamics. Innovation and responsiveness cannot be rigorously instructed, and the creative collaboration they require cannot be simply commanded.

However, such small firms have severe constraints to own resources in an exclusive way, and it requires a substantial amount of transaction costs to obtain access to such resources externally, from partners. Transaction costs and coordination costs can have a very important factor to hinder or to foster the functioning of such small firms.

After a time, industrial dynamics may however let such small firms grow towards large firms who then rather protect than build market share. For that, some may however choose to constantly reinvent themselves and constantly re-innovate to maintain that market share in a constantly changing competitive landscape.¹⁹ Pushing forward a de facto standard, or establishing a standard and increasing the switching costs in a network industry, may also allow maintaining or extending existing market share.

Nonetheless, many activities in our society are still so capital intensive that they can only be done by large capital-intensive firms. Therefore, economies of scale will remain a factor to explain the size of some companies. Ocean ships, subsea communication cables, semiconductors or trains cannot be produced in small business entities, even not through coordination between them.

Another source of small firms –besides those that serve a customer niche– are specialized firms in a value chain. Instead of specializing in serving a particular customer niche, they perform one specific element of a value chain. The production and the use of technology is then divided across firms, similar to the division of labor –

¹⁷ Philippe Martin and Helene Rey, 'Financial Super-Markets: Size Matters for Asset Trade' (2004) 64 *Journal of International Economics* 335.

¹⁸ Landström, *Entrepreneurship, Competitiveness and Local Development* (n 15).

¹⁹ Joe Tidd and John Bessant, *Managing Innovation: Integrating Technological, Market and Organizational Change* (John Wiley & Sons 2011).

innovative labor in this case.²⁰ Using new technologies, such specialized firms can create competitive advantage. A key thing about specialization in a knowledge intensive setting is learning: by continuously doing things, the cost per individual performance becomes lower. Companies with great manufacturing or distribution abilities may not have the necessary R&D skills and vice versa. Instead of building such capacities themselves, accessing that knowledge can result in a reduced lead-time. A number of value chains that used to take place in vertically integrated companies, have now been decomposed or modularized. For instance in the semiconductor industry, one can now find firms that only design semiconductors (fabless semiconductor firms) but who do not own plants (called "fabs" in industry) – this is outsourced to specialized manufacturers (foundries).²¹ Firms have become more dependent on suitable partners to stay competitive.

2. Hazards and costs in transactions with technology-driven firms

This study will focus on transactions that are a result of a constraint or a strategic choice to access resources externally or to coordinate with other entities. This external sourcing or this coordination implies a higher transaction cost compared to an internal access inside the firm (which is not always available). One of the sources of transactions costs is for instance the difficulty to find a partner. Another source is the exposure to counterparty risks in relationship-driven transactions (opportunistic hazards and poor performance) – and the efforts that it takes to anticipate this. Also, in contrast to normal resources like well-defined products, markets to access such externally owned resources may be incomplete and may not adequately offer enough supply for a specific demand under a specific exchange. This is possibly also due to the transaction costs, if they turn out to be prohibitively high. Even difficulties around valuation can significantly increase transaction costs. A lack of institutions and a lack of transparent information flow may also have a role.

It is the access to relationship-dependent resources that will be discussed in this study, together with some private mechanisms to reduce the transaction costs for them. Such mechanisms may for instance be coordination mechanisms between the different (potential) parties. Such coordination mechanisms may however lack support in our legal infrastructure, or existing coordination mechanisms may prevent the emergence of other ones. A main goal of this study is to expose these problems.

Here, I will first describe some resources around which technology-driven firms may transact, before introducing the different types of transaction costs and their sources.

²⁰ Ashish Arora and Alfonso Gambardella, 'Ideas for Rent: An Overview of Markets for Technology' (2010) 19 *Industrial and Corporate Change* 775.

²¹ Bernard Guilhon, *Technology and Markets for Knowledge: Knowledge Creation, Diffusion, and Exchange Within a Growing Economy* (Springer 2001).

2.1. Resources with a high degree of counterparty dependency, and external uncertainty

The resources that are subject to such interfirm or relational transactions, may for instance be capital, knowledge, production capacity, intellectual property, labor or other human assets, inventory management, repair capacity, research capacity, distribution channels, marketing channels (i.e. in new markets), technology, brand loyalty, reputation, supplier networks, etc.

For some resources, there's already an interfirm or relational market operating with well-understood compensation practices. In the labor market, one is for instance paid in wages (or a combination of wages and profits, as an incentive mechanism). In the intellectual property market, one is paid in economic rents. In the financial markets, one is paid in interests or in profits. Other markets may have other generally accepted exchange practices.

Many of these resources here share a number of properties: for instance a lack of a physical character which otherwise limits the geographical reach, although the firm or person that offers the access to the resource may have such limitation. For instance, in case of knowledge: the physicality depends on the tacit or codified nature of the knowledge.²² In case of tacit knowledge, the physical limitation depends on the expert who holds the knowledge. Also, many of these markets lack adequate institutions and transparent information flows – and such an underperforming market may actually give a competitive advantage to those who hold certain resources internally or who already have privileged access externally.²³

2.1.1. Capital

A major resource is of course capital. Investing in technology-driven firms takes normally place through equity. Return will then come from sales in the secondary market, as technology-driven firms will generally not distribute dividends (especially not when aggressive growth is preferred). The entire second and third chapter will discuss the access to capital, and especially the search and contracting costs. This will also largely depend on the question if coordination infrastructure is available or not, or if the equity is rigid (for easier coordination when many investors are present) or rather negotiable.

Instead of return objectives, some may also consider equity stakes for their optionality. A potential acquirer or partner may consider holding a minority equity stake as an option right in a company that holds or develops a complementary asset.²⁴ This may

²² Paul Jackson and Reima Suomi, *E-Business and Workplace Redesign* (Routledge 2003).

²³ Jay B Barney, 'Strategic Factor Markets: Expectations, Luck, and Business Strategy' (1986) 32 *Management science* 1231.

²⁴ Wim Vanhaverbeke, Vareska Van de Vrande and Henry Chesbrough, 'Understanding the Advantages of Open Innovation Practices in Corporate Venturing in Terms of Real Options' (2008) 17 *Creativity and Innovation Management* 251.

later result in a full acquisition and thereby result in full control over the complementary asset (which offers a competitive advantage).

2.1.2. Technology (possibly innovative technology)

Through the exclusivity granted by the patent system, the legal system gives (qualifying) knowledge the characteristics of a private good. It may therefore be appropriate to call this privatized knowledge “technology” or “intellectual property”. This should be separated from the products that integrate or bundle the technology. Intellectual property laws have made it easier to trade technology; the owner of the patent can either exploit the patent exclusively, or he can transfer the right to exploit it to a partner.

A “not invented here” syndrome has been identified, as a sort of hurdle to actually import technology that has been developed elsewhere. Another hurdle for a well functioning market, may be the prohibitive transaction costs. Nonetheless, there is such a market, and there has been one since long time. For the US for instance, there has been evidence that before the emergence of large corporations, a vibrant market for patents existed.²⁵

2.1.3. Knowledge (possibly innovative knowledge)

Knowledge can for instance be about the familiarity with a local market, or capabilities around technology. Knowledge is a non-rivalrous good, which means that two parties can use certain knowledge simultaneously without it suffering a loss of quality. Knowledge is exchanged under various names: as technical assistance, R&D services, consultancy, employment, acquisitions, etc. Knowledge may be tacit, which means that persons experience difficulties to articulate it.²⁶ In that case, it requires access to the expert to use the knowledge. For that reason, firms may prefer to locate in regions where knowledgeable workers are available. Considering a need to articulate knowledge may also be a question of costs.²⁷ Knowledge will also often be absorbed by the counterparty, during a cooperation. This is called absorptive learning.²⁸ This incurs the risk that competitive knowledge can get lost – thereby potentially creating a competitor.²⁹

²⁵ Naomi R Lamoreaux, Kenneth L Sokoloff and Dhanoos Sutthiphisal, ‘Patent Alchemy: The Market for Technology in US History’ (2013) 87 *Business History Review* 3.

²⁶ Michael Polanyi, ‘The Logic of Tacit Inference’ (1966) 41 *Philosophy* 1.

²⁷ Ashish Arora, Andrea Fosfuri and Alfonso Gambardella, ‘Markets for Technology and Their Implications for Corporate Strategy’ (2001) 10 *Industrial and Corporate Change* 419.

²⁸ Dries Faems, Bart Van Looy and Koenraad Debackere, ‘Interorganizational Collaboration and Innovation: Toward a Portfolio Approach’ (2005) 22 *Journal of Product Innovation Management* 238; Peter J Lane and Michael Lubatkin, ‘Relative Absorptive Capacity and Interorganizational Learning’ (1998) 19 *Strategic Management Journal* 461.

²⁹ Ashish Arora and Andrea Fosfuri, ‘Licensing the Market for Technology’ (2003) 52 *Journal of Economic Behavior & Organization* 277.

2.1.4. Reputation / signaling of legitimacy

Young companies face a liability of newness. To overcome this, and to be more credible towards potential clients, employees, investors and other potential parties, such firms may seek endorsement by reputable partners like venture capital firms.³⁰ Also, business relationships with credible corporations may reduce much of the external uncertainty that would otherwise make potential investors uncomfortable.³¹ It signals confidence from established companies, and access to complementary resources (i.e. commercialization channels).

2.1.5. Commercialization: marketing, distribution and supply

Marketing and distribution channels take time to create. Partnering with a firm with existing supply channels can substantially reduce that time investment and the exposure to external risks. This can for instance be used in case of international expansion. A foreign partner may then also have knowledge about the foreign market.

2.1.6. Innovative entities

As already indicated under access to capital, access to complementary resources can also take place under the form of a market for firms. An acquisition of a firm can offer exclusive and transaction cost free access to the complementary resource (knowledge, market channel, market share, economies of scale, etc.). And it didn't take the time and uncertainty to develop it. Companies often prefer such access at a later but more certain stage of the technology, innovation or market entry.

In the life sciences industry, the focus lies often on buying the entire company, including all tacit and explicit knowledge. In chemical, pharmaceutical and biotechnology industries, with high development costs and long development cycles, exclusive licenses are rather the norm to obtain access to the complementary resource in a rather exclusive way.

Vertical integration is in a Coasian world also a device to overcome opportunistic hazards and information asymmetries. Also for Williamson are organizations considered as devices to economize on transaction costs.³² Disadvantages relate to the industry trends that have been described above: vertical integration reduces a level of specialization that could otherwise exist, and it may reduce the ability to respond to client information.

³⁰ Antonio Davila, George Foster and Mahendra Gupta, 'Venture Capital Financing and the Growth of Startup Firms' (2003) 18 Journal of business venturing 689.

³¹ Toby E Stuart, Ha Hoang and Ralph C Hybels, 'Interorganizational Endorsements and the Performance of Entrepreneurial Ventures' (1999) 44 Administrative science quarterly 315.

³² Oliver E Williamson, 'The Vertical Integration of Production: Market Failure Considerations' (1971) 61 The American Economic Review 112.

2.2. High transaction costs, and the role of embeddedness in networks and communities

The relationship driven nature of the transactions, but also the uncertainties involved, make them inherently subject to high transaction costs. Not only is it difficult to find suitable partners: unlike instant markets for goods, the mechanisms to find a suitable partner may be more opaque. Also, these transactions create a dependency on the counterparty that acts as a host or carrier of an underlying resource. The exposure to counterparty risks like opportunistic hazards or poor performance in the meantime is substantial, and this requires an adequate level of trust to feel confident to transact with the counterparty, or it creates a cost to design and use contractual mechanisms that prevent such hazards. Thereafter, the ongoing monitoring and the possible enforcement may also be costly. Enforcement will rather be an ex-post mechanism that one will prefer not to use in such transactions: not only due to the high direct costs, but also since recovery from transaction failure may be prohibitively costly. In instant spot markets for goods, rapid transaction takes place because there is a trust infrastructure of laws and enforcement in place that ensures that if either party cheats, they are likely to be caught and punished. This legal framework also applies to relationship-driven transactions, but this is much less satisfactory there – and ex-ante trust plays a much more important role here. Therefore, in contrast to the traditional transaction cost theory, I will attribute substantial attention to the element of trust.

These elements are all in strong contrast to the instant markets for goods or generic services. Relationship-driven transactions are about resources that are much more difficult to standardize and to price (i.e. the price for a 10% equity stake in a non-listed company is difficult to value). This makes the interface between firms much more difficult.

2.2.1. Search costs related to identifying counterparties

Unlike instant and anonymous markets for goods, counterparties and resources in a relationship driven market cannot necessarily be found like shopping in a shop or a catalogue. It may require polling a network around a person or firm, or potentially the extended network through referrals of intermediaries (potentially the network of a service provider like a lawyer or a venture capitalist, but perhaps also a professional intermediary). Sometimes, directories and word of mouth may provide information on how to locate potential counterparties. Also, membership in an open or closed community or platform (i.e. a spatial community or an industry community) may allow locating potential counterparties. A disadvantage of networks and communities is that the necessary counterparty may potentially not be part of this network or community. Only few potential parties may publicly advertise their presence in a market (i.e. through advertising or other forms of signaling), although this will be less the case than in markets around standardized and commoditized goods and services. Many parties are just opaque and initially invisible. Still, the flow of information is essential for the functioning of a market, at least for the search for counterparties and for conveying information on their trustworthiness.

The just mentioned communities can be open and informal, but may also be a specifically created form of market infrastructure, and the degree of centralization or fragmentation of such platforms may vary. They become more interesting for potential participants depending on the number of participants that already participate (known as network effects, or increasing returns).³³ Sometimes, the creation of such platforms or community may represent an entrepreneurial opportunity. But if such incentive for a lead partner is missing, then there may be a coordination failure to create one, if no informal community has already been formed organically.

Many internet entrepreneurs have spotted the drastically information lowering effect of the internet and they have created online platforms. Communities/platforms can now be constructed based on a special interest, but at the same cost on a global scale as at a local scale. In part two, I will discuss how such new internet platforms in the financing domain clash with the regulations that have basically embedded the setup where such central platforms were mutually created by intermediaries – and which therefore also required to use such intermediaries to access them.

Search costs alone can even eliminate all potential returns from a transaction. But even if a counterparty can be located, then the search for an alternative (for comparison) can be too costly and that counterparty can exploit this lock-in and can use it as bargaining power.

2.2.2. Trust building & selecting – potentially through contract costs

I use the transaction cost framework to discuss the costs that a relationship-driven transaction incurs.³⁴ Unlike a trade of a physical asset, the performance is much harder to assess upfront and the personal characteristics of the counterparty are much more important - as the obligation still needs to be delivered after all. During that long time, a party may behave opportunistically or may offer poor performance. Agency settings are an example: agents, like managers may have self-dealing incentives and may exploit information asymmetries to gain from their principals, instead of for their principals.

The transaction costs theory relies on contracting or legal mechanisms (i.e. the threat of legal sanctions, control through equity transactions, etc) to prevent the occurrence of opportunistic hazards or poor performance. These ex-post mechanisms may also create ex-ante trust (as they may create a threat for costly sanctions). Ex-ante trust is important. Adverse selection will take place when no trust is available. Parties will then protect themselves by assimilating all potential partners as opportunistic or poorly performing partners. As a result, good quality counterparties may withdraw from the market when it is too costly for them to signal their inherent quality in an environment where they will be considered as a bad counterparty by default. And as a result, only bad firms will stay in the market and will be available for contracting. This is the

³³ John Hagel, 'Net Gain: Expanding Markets through Virtual Communities' (1999) 13 *Journal of Interactive Marketing* 55.

³⁴ Oliver E Williamson, 'Transaction Cost Economics' in Claude Menard and Mary M Shirley (eds), *Handbook of New Institutional Economics* (Springer 2005).

“market for lemons” problem, as described by Akerlof.³⁵ It is an application of Gresham’s law where bad quality is crowding out good quality. To put it otherwise, the market breaks down.

However, the transaction cost theory can be criticized as it fails to recognize non-legal sources of ex-ante trust. This study will however consider a substantial role of ex-ante trust, also from non-legal sources.

A number of reasons explain the increased attention for ex-ante trust. First, ex-post remedies may not offer full recovery (i.e. legal remedies may be limited to foreseeable damages), may be too late, or may lead to a gridlock situation (i.e. reciprocating a non-performance and thereby having a mutual hostage over the situation). Secondly, enforcement costs may also be too high. Finally, the opportunity cost of a long-term interaction in general is high: it may be prohibitively costly to search for another party and to re-enter in such long arrangement. A counterparty may be aware of that dependency and of the lock-in position. This dependency may be related to the resource that forms the core of the transaction: for example a transaction specific asset that has been developed³⁶, or the case where a resource is unique and necessary (and by extension also the dependency on one specific counterparty). Especially young firms may not be able to recover from such failure.³⁷ Therefore, ex-ante trust is important to be able to select a counterparty.

Ex-ante trust can be inherent or it can be based on the risk for extrinsic costs like legal or social threats. The notion of trust is often only used to describe the context of inherent trust, or where extralegal sources act as an extrinsic force. It is then ‘self-enforcing’, or a form of ‘private ordering’.³⁸ I will approach the different sources of trust in a more holistic way.

Sometimes, parties can be intrinsically trustworthy – even without the need for external threats with legal and social sanctions to prevent untrustworthy behavior. However, they may feel a need to signal this. Likewise, there are numerous cases where a party may not be driven by return or self-interest, but rather by intrinsic motivations like love, fun, altruism and duty to contribute into a transaction. The motivation can also be the hope that such inherently non-compulsory gestures will be returned. There is then an expectation of direct reciprocity. There may also be a level of indirect expectation of reciprocity. Expectations based on self-interest or rationality are then ultimately still a basis to explain the behavior to enter into the transaction. But it is an unstable equilibrium as the first instance of non-cooperation can lead to a breakdown.

³⁵ George A Akerlof, ‘The Market for “Lemons”: Quality Uncertainty and the Market Mechanism’ (1970) 84 *The Quarterly Journal of Economics* 488.

³⁶ Oliver E Williamson, *The Economic Institutions of Capitalism* (Simon and Schuster 1985).

³⁷ Rajneesh Narula, ‘R&D Collaboration by SMEs: New Opportunities and Limitations in the Face of Globalisation’ (2004) 24 *Technovation* 153.

³⁸ Lester G Telser, ‘A Theory of Self-Enforcing Agreements’ (1980) 53 *The Journal of Business* 27; Williamson, *The Economic Institutions of Capitalism* (n 36).

Trustworthiness will often be a result of the rational threat for sanctions (legal sanctions or social sanctions).³⁹ Then, the threat and cost of these sanctions (which should thus not only be legal ones) can create a reasonable expectation that one will not behave opportunistically. This offers protection against breakdown of the equilibrium.

Before describing state-provided contract law, which is safeguarded by state-provided enforcement, I will describe extrinsic sources of trust that are based on relational mechanisms.⁴⁰ The latter ones may be directly between parties involved, or may be through indirect social mechanisms involving reputation and a threat for sanctions from third parties.⁴¹

A first relational sanctioning mechanism exists in direct relationships between the parties involved: namely reciprocal hostages or the risk for boycott in cases of repeat transactions. Misaligned behavior will obstruct the possibility for repeat business. But information on the commitment of new potential parties (strangers) is not yet available. Just like the case of intrinsic trustworthiness (which may not be distinguishable from trustworthy behavior that is induced by sanctions), the process of getting to know each other (obtaining information) and to produce credible signals is costly for both parties. As trust will typically be based on personal acquaintance and experience, assuring oneself of the trustworthiness could thus be costly. It may require a time investment and information costs to construct a reasonable assurance ex-ante.

Trustworthiness of strangers also has a substantial perceptual component. Some parties may find it easier than others to consider potential counterparties as trustworthy. Different degrees of perceived trust to deal with strangers do indeed exist (i.e. Italians are known to have a low degree of trust towards strangers to undertake business relationships⁴²). Whole regions can find themselves stuck at low-trust and poor-performing equilibriums (a form of prisoner's dilemma). Preferring to deal with group members instead of strangers may also have to do with biology's notion of kin selection in order to enhance the group's fitness vis-à-vis non group members, even at a cost of an individual's fitness (i.e. the individual may be better off by selecting the stranger as the optimal party may not be part of the community).⁴³

Partnering with costly providers of certification can give a shortcut to access new parties, and to gain trustworthiness despite being a stranger. This can be through intermediaries for instance, who have a costly reputation on the line and who are

³⁹ Diego Gambetta, 'Can We Trust Trust', *Trust: Making and breaking cooperative relations* (Basil Blackwell 1988).

⁴⁰ Ronald Dore, 'Goodwill and the Spirit of Market Capitalism' (1983) 34 *British journal of Sociology* 459; Jeffrey L Bradach and Robert G Eccles, 'Price, Authority, and Trust: From Ideal Types to Plural Forms' (1989) 15 *Annual review of sociology* 97.

⁴¹ David M Kreps and Robert Wilson, 'Reputation and Imperfect Information' (1982) 27 *Journal of economic theory* 253.

⁴² Lenard Huff and Lane Kelley, 'Levels of Organizational Trust in Individualist Versus Collectivist Societies: A Seven-Nation Study' (2003) 14 *Organization Science* 81.

⁴³ WD Hamilton, 'The Genetical Evolution of Social Behaviour. I' (1964) 7 *Journal of Theoretical Biology* 1.

supposed to undertake sufficient due diligence as they have an interest to endorse good quality parties only.⁴⁴

The risk to lose a reputation is also a sanction that applies in indirect relationships. When information can flow transparently, then one can also assess the trustworthiness through information and experiences from third parties. Open feedback information can for instance easily flow in business communities or associations. It gives the information that experience from repeat transactions would give, although these transactions can be done with other parties.⁴⁵ Especially in close non-anonymous networks can there be a self-reinforcing interest to honor obligations.⁴⁶ That is especially true in settings of close physical proximity. But this can possibly even happen in any open setting, where information about past performances is shared in a fully open and transparent way (potentially publicly available even – as the world's economy globalizes, it becomes ever more difficult to get rid of a bad commercial reputation.).

Embedding a relationship in a community also increases the effectiveness of social sanctions that need to increase the cost of defecting and that need to impose de-facto trustworthy behavior. For instance, the loss of (costly) reputation through shame and guilt becomes more severe (as it stretches further than just one party). Also formal sanctions or community exclusion –ostracism– are more severe than a simply inter-party boycott.

The embeddedness of actor's actions in a structure of social relations is something that is often grouped under the notion of social capital.⁴⁷ Besides the trust enhancing role, this embeddedness also has a search cost reducing role. However, a counterparty may not be part of one's network or even the community where one participates in. The reinforcing effect of a community may then have no effect. Also, a collective action problem may prevent such communities from emerging if they do not emerge organically. Such communities will receive more attention in this study, thanks to those important benefits, but also due to that collective action problem. Another collective mechanism to enhance trust, besides communities, may be the mechanisms of insurance.

Social sanctions indeed eventually run into an obstacle: they cannot resolve conflicts between complete strangers, or they can take too much time to effectively assure oneself of the trustworthiness of the counterparty. Therefore, parties may use legal

⁴⁴ Yuk-Shee Chan, 'On the Positive Role of Financial Intermediation in Allocation of Venture Capital in a Market with Imperfect Information' (1983) 38 *The Journal of Finance* 1543.

⁴⁵ Christiaan Grootaert, 'The Missing Link?' in Paul Dekker and Erik M Uslaner (eds), *Social capital and participation in everyday life* (Routledge 2001); Josh Boyd, 'In Community We Trust: Online Security Communication at eBay' (2002) 7 *Journal of Computer-Mediated Communication* 0; Partha Dasgupta, 'Economics of Social Capital' (2005) 81 *Economic Record* S2; Meng-Hsiang Hsu and others, 'Knowledge Sharing Behavior in Virtual Communities: The Relationship between Trust, Self-Efficacy, and Outcome Expectations' (2007) 65 *International Journal of Human-Computer Studies* 153.

⁴⁶ Martin Gargiulo and Mario Benassi, 'Trapped in Your Own Net? Network Cohesion, Structural Holes, and the Adaptation of Social Capital' (2000) 11 *Organization science* 183.

⁴⁷ Paul S Adler and Seok-Woo Kwon, 'Social Capital: Prospects for a New Concept' (2002) 27 *Academy of management review* 17.

mechanisms and state-enforceable contracts to create costs for defection. In a contractual fashion, hostages can also be foreseen to discourage nonperformance. Also, parties can be locked in to prevent opportunistic attitudes when negotiating follow-on contracts under conditions where one party has become dependent on the specific counterparty.

However, it has been highlighted before that such legal sanctions, and even their ex-ante effect, have their drawbacks as well. These legal sanctions may co-exist with the social sanctions that will still be possible. Therefore, this study will consider an enriched transacting model where contracting and ex-ante trust building will both take place:

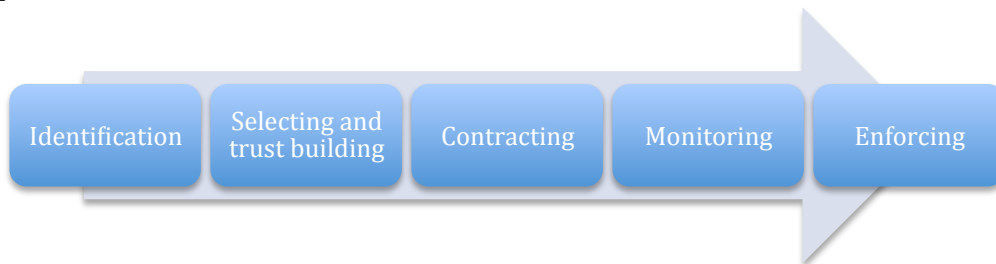


Figure 1: enriched transaction cost process

As relationship-driven transactions are already very extensively controlled by social norms and sanctions, one can of course also consider what the effect may be of the combination of social sanctions with legal sanctions. Sometimes, legal norms are nothing more than an expression and internalization of a social norm. But some authors consider that contracts are detrimental to (non-legal) trust.⁴⁸ The presence of legal sanctions may make people to conform only to them, as they anticipate that the counterparty will only expect that and not the intrinsic goodwill that they would otherwise additionally give.⁴⁹ Because the presence of the sanctioning system will give people the idea that others are self-interested, it may undermine the trust that others may be internally motivated to cooperate. Measures imposed to increase trust extrinsically may unintentionally harm intrinsic trust. This may lead people to perform “just enough” instead of magnificently.

2.2.3. Monitoring costs

The source of disappointing results of a transaction may be difficult to observe: it may be due to external circumstances, or due to opportunism and bad performance. Ongoing performances are especially difficult to measure and to meter, in order to decide if a best effort has been delivered or not. For instance, for knowledge workers, time is a mostly used metering proxy. However, being physically present may not exclude that

⁴⁸ Akbar Zaheer, Bill McEvily and Vincenzo Perrone, ‘Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance’ (1998) 9 *Organization science* 141.

⁴⁹ Ann E Tenbrunsel and David M Messick, ‘Sanctioning Systems, Decision Frames, and Cooperation’ (1999) 44 *Administrative Science Quarterly* 684; Sim B Sitkin and Nancy L Roth, ‘Explaining the Limited Effectiveness of Legalistic “remedies” for Trust/distrust’ (1993) 4 *Organization science* 367.

the employee limits its efforts and invests his knowledge in a side-project instead. Increasing the monitoring mechanisms (i.e. oversight mechanisms), come at an information cost.

2.2.4. Enforcement costs

Before, I already highlighted that enforcement of sanctions comes at a cost and that the counterparty may be aware of this costly enforcement (thereby increasing room for opportunistic behavior). I mentioned that parties might prefer ex-ante mechanisms. This study will not look at legal enforcement.

2.3. Market incompleteness

The above mentioned transaction costs are a reason of market incompleteness. Costs may be too high to overcome, and transactions may not take place. However, also other reasons may be responsible for this market incompleteness.

First of all, long-term interactions are difficult to value. Especially for transactions that have a form of financial consideration, there will be a lot of valuation problems. Besides the already mentioned exposure to opportunistic hazards and poor performances, there is also an extensive exposure to external risks during the time of the collaboration. Valuations may even be highly subjective, dependent on relative advantage or subject to social interactions (like bandwagon effects, herd mentality, speculation and confidence games, or anchoring if price discovery mechanisms are available). Speculation may even add to this, and may reduce the market to an anticipatory game. This all has the inherent property that there is a potential for bubbles and crashes.⁵⁰ Once a run away from one asset class takes place, then transmission effects like spill over and contagion effects (i.e. herding) can even lead to systemic crises.⁵¹

The external uncertainties may especially have a prohibitive role in transactions that revolve around financial returns. An example of an external uncertainty is for instance the risk of not finding follow up finance (capital risk). Later, I will also describe uncertainties that relate to the technology and the market acceptance, at the operational side of a firm. The risk adjusted return metrics for technology-driven firms may for instance be insufficient compared to other risk adjusted returns from more established companies, or compared to other asset classes in general. But there are also studies that demonstrate very decent returns.⁵² Within the different types of

⁵⁰ Helge Peukert, 'Dysfunctional Aspects of Contemporary Financial Markets: Diagnosis and Prescription' (2012) 33 *European Journal of Law and Economics* 321.

⁵¹ Cheng-Few Lee and John Lee, *Handbook of Quantitative Finance and Risk Management* (Springer 2010).

⁵² Roger Kelly, 'The Performance and Prospects of European Venture Capital' (EIF Research & Market Analysis 2011) Working Paper 09/2011
<http://www.eif.org/news_centre/publications/eif_wp_2011_009_EU_Venture.pdf> accessed 22 November 2011.

government interventions that have been used, and which will be discussed later, influencing the price mechanism has been a popular method to unlock such capital towards technology-driven firms. One can think of tax incentives, co-investment schemes with public money or downside protections. A popular tax incentive is to discard the capital gains tax if a minimum investment period is met (i.e. 6 months in Luxembourg, one year in Portugal or one year in France).⁵³ Actually, in Europe, about one third of the money in venture capital funds has a public origin (often coming from the European Investment Fund).⁵⁴

Parties may also not be present in the market for other reasons. Patent holders may for instance choose not to license technology, as the technology represents a source of competitive advantage. Another example is companies that lack the interfaces (departments, employees, etc.) to formulate or to deal with requests to enter into partnerships to access resources. Another example is employees in countries with severe non-compete restrictions who may not be available in the employment market as a result of those restrictions. A similar case was the prudent men rule prior to 1979 that prevented US pension funds to invest substantial amounts into (inherently risky) venture capital.⁵⁵ Today, capital requirement directives and solvency directives also still lock up capital in Europe, and they require for instance more investment in liquid assets instead of illiquid assets like venture capital. Tax obstacles may also lock up capital, or may render it immobile (i.e. due to the risk that a venture capital investment may create a permanent establishment classification abroad, when an investment is made abroad).⁵⁶

2.4. Collective action costs and coordination surpluses

The enriched transaction cost model revealed the role of market infrastructure: namely the role of platforms and communities to reduce the search costs, but also to enhance the role of ex-ante trust. In contrast to open markets like markets for instant transactions around goods or standardized shares, or in contrast to partially open markets (i.e. venture capitalists who display themselves publicly, while potential investees may not do so), the opaque markets for the resources under the scope of this study often have network-based mechanisms (through brokers, who extend their

⁵³ EBAN and BDO, 'Compendium of Fiscal Incentives Available to Business Angels in Europe' (EBAN 2009) <<http://www.eban.org/wp-content/uploads/2013/02/EBAN-COMPENDIUM-OF-FISCAL-INCENTIVES-AVAILABLE-TO-BUSINESS-ANGELS-IN-EUROPE.pdf>> accessed 24 November 2011.

⁵⁴ Erik PM Vermeulen, 'Innovations in the PE Cycle' (2013) <<http://pesummit.nl/files/pdf/Presentation%20Erik%20Vermeulen%20-%20PE%20Cycle.pdf>> accessed 17 May 2013.

⁵⁵ Paul Gompers and Josh Lerner, 'The Venture Capital Revolution' (2001) 15 *Journal of Economic Perspectives* 145.

⁵⁶ European Commission, 'Report of Expert Group on Removing Tax Obstacles to Cross-Border Venture Capital Investments' (2010) <http://ec.europa.eu/taxation_customs/resources/documents/taxation/company_tax/initiatives_small_business/venture_capital/tax_obstacles_venture_capital_en.pdf> accessed 11 October 2012.

reputation), or function through organically grown communities or through platform facilities.

Such community or platform infrastructures thus have an important role to let a market function. For instance, if a transaction is not embedded in a trust community where reputational information can flow, then a cheater may never face any repercussions (i.e. no risk for boycott). Such communities or platforms may spontaneously arise in a non-anonymous spatial context, but also when a lead entrepreneur spotted an entrepreneurial opportunity to build a critical mass of members based on commercial terms. But when this is not the case, platforms or communities may however fail to arise as well. Coordination failures are the current frontier of market failures that need to be looked after.

There are also other examples where coordination may bring surpluses, besides communities and platforms that can internalize negative externalizers, or that can improve the information flows to reduce search and due diligence costs. With a landscape of many specialized agents today, such firms may miss out instances where large vertically integrated firms could benefit from economies of scale or other forms of coordinated action. Large vertically integrated firms do thus not only economize by eliminating the cost of potential opportunistic behavior as Ronald Coase analyzed in his 1937 research on the determinants or the optimal size of a firm.⁵⁷ Nonetheless, the existence of small decentralized firms may be grounded on convincing reasons like competitive advantage through economies of specialization or through better responsiveness to environmental circumstances (vertically integrated entities lack the ability to handle localized information or to serve quickly moving markets or market niches). To still have the benefits of vertically integrated firms, such decentralized firms can then bond for interfirm cooperation and coordinated. There can be instances where cooperation offers better outcomes (i.e. less duplicate costs and efforts) than competition. These collective actions are however costly, just like I described how bilateral transactions around resources are costly. Sometimes, the collective action cost may be prohibitive.

Thus, in any landscape with decentralized agents, may there be cases where coordinated actions may lead to a better outcome to those who participate in the coordination. However, the failure to come to such a coordinated action may put the agents involved in a suboptimal setting for which they lack the incentives, the communication flows or the means to overcome the costs to escape the situation: this is an instance of the prisoner's dilemma but over a larger scale than just two parties.

The problem with such collective actions costs has often to do with finding the right set of incentives at a reasonable cost to let a large group of participants join in a concerted action. If all actions would rely on individual negotiations, then this would be too costly due to the large number of participants. Also, overcoming the cost to engage in concerted action will depend on the number of other participants: network effects dictate that a minimum critical mass is necessary, but that increasing returns will then create an upwards spiral.

⁵⁷ Ronald H Coase, 'The Nature of the Firm' (1937) 4 *Economica* 386.

It is also important to reserve the advantages to those who contribute in the costs, to prevent breakdown. The presence of free riders who benefit from the advantages, but who would not contribute to the costs, may be detrimental.⁵⁸ For instance, if certain formal rules or standards would operate in a community, then Individuals would often face a private cost when complying with the precepts of the rule, and they generally derive a benefit because of the compliance of others with existing rules.⁵⁹ There may be cases where not joining may effectively be a better outcome for some parties, which leads to a breakdown of the coordination. The existence of an incentive not to reap the cost, while still using the benefit, requires mechanisms to prevent that.

Besides overcoming a collective action cost with the right incentives, it is also important to anticipate a coordination failure that may exist when participants would still behave competitively instead of according to the prescribed collaborative behavior. To prevent that a party should actually become more powerful vis-à-vis other members after the initiation of a collaboration, and would choose to compete again instead of cooperate, a lock up may also be needed. This protects the coordination participants at a later stage.

A level of coordination may also involve ongoing overhead costs. And depending on the organization, there may be minor cases of misalignment between the managers of the coordination infrastructure and the participants.

Hereafter, I will discuss some cases of coordination efforts. Those may be to create market infrastructure to enhance trust and to reduce search costs. Some trust enhancing mechanism will defend against negative externalizers (opportunistic group members). Other efforts may be rather aimed at lowering the transaction costs between individual members by coordinating between them collectively (i.e. setting standards for the handoff interfaces between members). I will call them type I and type II types of coordination. I will discuss the failures to let such type I coordination arise, in the context of accessing financial resources in part two of this study, and in the context of accessing non-financial resources in part four of this study. I will also discuss how type II coordination is needed between some market infrastructure providers in the financial domain, in part two, and in the non-financial domain, in part four. In part three, I will discuss how standard equity and the corporation provided a useful form of type II coordination, but how they prevent at the same time some transactions where freedom is expressly wanted over the state-provided standardization.

Another type of efforts, namely alliances with a “joint” or “mutual” element between two or more partners, like joint research efforts, joint development efforts, joint sourcing efforts, joint distribution, joint marketing efforts or joint commercialization efforts, will not be discussed here as those are from another nature. The latter ones may also be the formation of a partnership to have more bargaining power towards a common counterparty, like the formation of a cartel or a merger to derive monopoly rents from the clients (although counterbalanced through the existence of antitrust laws). Those latter forms of bonding are rather to protect market share in economy of scale industries or in situation where artificial elements like brand loyalty protect

⁵⁸ Ana Espinola-Arredondo, *Free-Riding and Cooperation in Environmental Games* (ProQuest 2008).

⁵⁹ Francesco Parisi, ‘Sources of Law and the Institutional Design of Lawmaking’ (2001) 19 *Journal of Public Finance and Public Choice* 95.

market share (instead of constantly having to spend energy on innovation in order to outrun competitors). They are more a matter of mature firms that have captured market share, and that now may want to benefit from the market share or brand loyalty. Those types of coordination will not be discussed here.

2.4.1. *Type I: bonding to create a conducive environment*

Communities or platforms where members can learn about each other's existence and characteristics, can economize on the search costs to otherwise find about such a party. The larger the number of members, the more increasing returns there may be (positive network effects). Also, earlier, I pointed to the increased effectiveness that trust, social sanctions and information flows may have in a community. That may also be a driver for forming such platforms or communities (and the search cost reduction will still be inherent). And besides formal appearances, there may already exist an informal flow of information between the members of an industry, a geography or a group. Also, a formalized community may supplement such informal social network and may for instance be embedded in a regional cluster, or group; that it therefore reinforces.

For instance, the community may protect members against negative externalizers. By excluding negative externalizers from transactions with the group members, it should effectively create an incentive to join the group. It should at least be a severe enough threat that one will be excluded from potential transactions with the group members in case of opportunistic behavior (unless the negative externalizer is in such a powerful position that incentives continue to exist not to join the group). Collective action is sustained through such "closed shop" incentives and with advantages that are only open to members.⁶⁰ A sharp difference between outsiders and insiders then exists.

This process is called internalization: namely that one now bears the costs of the actions where he would otherwise only feel the upside while others pay the costs.⁶¹ For instance, the cost of behaving opportunistically is now not only felt by the counterparty but it is indirectly returned to the one who behaved like that in the first place. In kin networks or spatial proximate settings where repeat transactions, information flows, reputation or a sense of group survival are important, this may automatically already be present.

Bonding to protect against externalizers in a group or industry, possibly with setting formal rules governing the relationships between its members, allows to reduce the trust discovery process as opponents will see the cost of opportunism and poor performance increase. It also allows reducing the search costs, besides this increasing effectiveness of social sanctions (i.e. better informational transparency). These forms of bonding can be called special interest communities, or platforms. Such special interest communities can be local, regional, national, international or global in geographical/spatial scope. However, the pervasiveness of IT has substantially lowered the cost of platforms and communities, even over long distances.

⁶⁰ Mancur Olson, *The Logic of Collective Action* (Harvard University Press 1965).

⁶¹ Israel Gilead, 'Tort Law and Internalization: The Gap between Private Loss and Social Cost' (1997) 17 *International Review of Law and Economics* 589.

If the benefits are so substantial, then operating the infrastructure for such platform or community may even offer a commercial opportunity. This will however not always be the case. Then, instead of an entrepreneurial party that takes the lead role to organize such a platform, industry members may join forces and realize that they need to invest to overcome individual transaction costs (when taken together, these can be called coordination costs) as the benefits will then outweigh the investment to overcome those individual costs once. However, this coordination may be prohibitively costly under the existing incentives (i.e. presence of free riders, existence of ex-ante holdup). This may require government intervention.

Expressly created industry communities or platforms that set formal norms to prevent against externalizers, closely resemble the role of governments in their role of formal sanction providers. One can speak of legal pluralism, where norms can be part of social relations, rather than exclusively be imposed by the state.⁶² This view of law acknowledges the importance of the state and of professional actors, but does not privilege state or professional contributions to law over those of other participants in social institutions. Pluralistic normative regimes have long existed in parallel to the state, and still exist today on a large scale. The general coordination mechanism of governments is partly obsolete, as it is now possible to create ad hoc groups for special interests where it was not possible before thanks to the cost-reducing function of IT. Social coordination is now cheaper than before. However, also the state itself still offers sanctions, dispute resolutions and enforcement for the domain of private transactions (i.e. contracts) – as society at large has an interest in lowering the transaction costs and improving the extrinsic existence of trust between economic agents in an economy (this creates positive externalities that will be discussed later).

Just like organically emerged communities, there are also organically emerged norms and customs in such communities (industries for instance). Besides collective action, also auto-creation can lead to norms despite the fact that norms are actually a public good.

2.4.2. Type II: bonding for better coordination

Other situations that may motivate coordination efforts to reach more efficiency are the formation of standards for the interaction and interfaces between the members (i.e. specialized and independent firms). As not all activities take place under the roof of one vertically integrated company, the handover can become costly if no knowledge/capabilities or standards are present to handle that handover cost effectively. As tasks are now often partitioned across different firms, the innovative

⁶² Marc Galanter, 'Justice in Many Rooms: Courts, Private Ordering, and Indigenous Law' (1981) 13 The Journal of Legal Pluralism and Unofficial Law 1; John Griffiths, 'What Is Legal Pluralism?' (1986) 18 The Journal of Legal Pluralism and Unofficial Law 1; Sally Engle Merry, 'Legal Pluralism' (1988) 22 Law & Society Review 869.

activity now often relies on knowledge and capabilities of different agents.⁶³ The collective cost of all transactions can thus be costly.

Standardization may reduce the accumulated transaction costs, especially when many transactions are necessary due to some complexities in the technology landscape. Instead of individual negotiations, which would still be manageable on a bilateral level, a standard may decrease the transaction costs of many transactions (the compound cost of individually negotiated transactions may be prohibitive otherwise). Standards may for instance be on the level of standard contracts (privately provided, or state-provided like standard equity in corporate entities for instance). Just like behavioral expectations following industry community practices, this also creates increasing returns if a whole industry is knowledgeable about them.

Similarly, specialized agents that mainly react to impulses that they can observe, may also lack the ability to process and observe the amount of overview or abstracted information that a larger agent can actually process (and which would be executed through instructions downward in the organization in that case). Bonding to observe and process overview information may also be increase the efficiency of decentralized agents, instead of merely acting on the basis of decentralized reflexes.

Bonding may also offer a bargaining mechanism against parties that may otherwise exercise much bargaining power or that may even create an ex-ante holdup situation. For instance, patent pools try to mitigate the bargaining power of individual (and necessary) patent holders. But they may not necessarily be able to success in this without changes in the legal framework (i.e. as the switching cost and the dependency on essential patents also increase once a pool operates, this makes it only more interesting for essential patent holders to stay out and to seek rents separately with those who have no other choice than to agree).

When more than two parties are involved, like such partner pools or standard setting organizations, a one-time social action problem arises – it requires a number of actors to join but incentives may be lacking, or may allow them to enter into competitive behavior once joined (as described in the previous paragraph). This may justify government intervention.

3. The interest in high tech firms in the broader context of society

In the previous title, I took the point of view of a private agent (often a firm). That point of view will be used regularly throughout this study. Such entrepreneur or firm has his own reflexes and incentives to enter into transactions and coordinations, although he is limited by costs and constraints. Many outsiders are interested in the wealth that such agents provide to their communities, or that they distribute towards their communities (i.e. through income from exports, income distribution through job creation, etc.). Where the previous title took the point of view of a firm, this title will take the point of

⁶³ Eric von Hippel, 'Economics of Product Development by Users: The Impact of "Sticky" Local Information' (1998) 44 Management Science 629; Eric von Hippel, "'Sticky Information" and the Locus of Problem Solving: Implications for Innovation' (1994) 40 Management Science 429.

view of society's interest. Society may have an interest to reduce the costs and barriers that such firms face.

Very similar to the recently discussed coordination forms that try to prevent negative effects of self-interest and competition, society is ultimately also a form of bonding to create overall optimal conditions and to prevent individuals from harming overall welfare. However, the scale of societies may require instruments that work in anonymous and long-distance settings, in contrast to industry-specific communities where non-anonymous devices like indirect reciprocity and boycott could still work. In the (anonymous) societies that are discussed here, legal sanctions and third party coercion will act as normative mechanisms that also work for "long distance" and anonymous interactions and where an opportunistic agent cannot be excluded.

Innovative ventures are the most successful elements to attract wealth to a society or region, in today's global competitive world. Therefore, it is important for law- and policymakers to understand the mechanics of such firms if they want to use them as a vector to bring wealth. Due to the uncertainties involved and the impossibility to efficiently act on localized information, direct intervention of a central government in the market is rather inefficient and the task is effectively better performed by firms who operate under optimal conditions. However, this understanding is actually a more recent understanding and numerous failed instances exist of direct market intervention – i.e. through adjusting the price mechanism and handing out public money to certain activities (and thereby often catastrophically bypassing the market-driven selection processes which rely on sound incentives and which have better access to decentralized information).

This part will describe the history of government interventions that went from combatting destructive self-interest behavior, to direct market interventions and finally to today's facilitating role. I will also link this with the understandings that evolved under economic theories.

The facilitating role that society takes today is however mixed with other goals, which may create tensions. Some societies for instance heavily focus on the public welfare role as well. The state then provides every member with the essential needs, and protects individuals from events that may adversely affect their wealth (i.e. through limiting exposure to risks, or through limiting the potential of adverse effects, or through insuring them). However, advancing society by letting risky firms experiment, may conflict with the notion of protecting individuals from being exposed to volatile transactions.

3.1. Different positive societal systems, and different roles for technology, entrepreneurship and innovation

The motivation to foster technology-driven firms is however only a standard to which societies have to adhere in today's globalized and free market economy to stay competitive and to be able to benefit from all the desirable elements that participating in such globalized free market economy brings.

Alternatives to the free market system are theoretically possible. Technology-driven firms then have another role, or no role at all. Theoretically, and in the past also in reality, communities have always existed that work under an instructed optimization scheme, instead of a free market system. Those could also create a form of ordering and expectations for all members in all situations, rather than functioning on the principles of free markets. Such instructed optimization schemes may have a wealth distribution goal or may optimize the group to compete as a group against another group (or empire). Even non-instructed community-based systems (or rather cultures) may exist, where generosity, empathy, trust, safety, fairness, and the experience of belonging are valued. Positive societal systems may conflict and diverge from underlying organically grown cultural systems.⁶⁴ And even without a positive system, it has already been suggested before that agents may also have inherent cooperative and prosocial behavior. Prosocial behavior is for instance also observed with some animals, especially when they live in stable groups.⁶⁵ Living in group is an example of the fact that coordinating may outbalance competition, but there may also be a genetic reason under the form of kin selection: the underlying mechanism of natural selection may be on the level of genes, individuals or groups. Selection can thus be based on the survival of the fittest (individuals compete), or kin selection (individuals sacrifice for survival of relatives in the group - helping those you are related to).⁶⁶

Humans evolved towards expanded groups like cities, and then nations. In free systems, the payoff of potentially destructive self-interested behavior increased due to the lower effectiveness of social sanctions when anonymity increased. Larger groups offered however economies of scale or competitive advantage in warfare or imperialistic actions against other groups.⁶⁷ Positive normative systems are then necessary and are particularly possible thanks to our mastery of language and the possibility to communicate (i.e. through writing). Thus, also free market systems require a minimum level of overhead.

Ultimately, it is not a matter if a planned or a free system is better than the other. It depends on the goals that are prioritized. It can be understood that each system reaches for the goals it sets forward in the first place, and actions should be considered within the increasing returns that the expectation of such actions in such system might have. Looking to the system, from the strengths of another system, and ultimately concluding that there is a case of inferiority, is merely a biased view.

However, irrespective of the mechanics of such different societal systems, there is a strong difference for the role of technology, innovation and entrepreneurship. While entrepreneurship has no function in planned systems, technology and innovation did have a function: at least a military-defensive function against the imperialism of other

⁶⁴ Aaron Wildavsky, 'Choosing Preferences by Constructing Institutions: A Cultural Theory of Preference Formation' in Arthur Asa Berger (ed), *Political culture and public opinion* (Transaction Publishers 1989).

⁶⁵ Robert L Trivers, 'The Evolution of Reciprocal Altruism' (1971) 46 *Quarterly review of biology* 35.

⁶⁶ John Maynard Smith, 'Kin Selection and Group Selection' (1964) 201 *Nature* 145.

⁶⁷ Niall Ferguson, *Colossus: The Rise and Fall of the American Empire* (Penguin 2012); Niall Ferguson, *Empire: How Britain Made the Modern World* (Penguin 2008).

societies. However, history has proven that free market systems offered stronger incentives for the emergence of technology and innovation than centrally planned systems, thanks to the potential payoff that entrepreneurship could offer. Centrally planned systems could only offer incentives like praise and group solidarity. Free market systems also now realize the wealth-enhancing role of technology and innovation – and this is even specifically fostered, together with entrepreneurship that acts as a vector.

When systems clash, or operate in a globalized world, it has been proved that the maximization systems that rely on freedom of its agents tend to conquer or dominate the systems that are based on planning.⁶⁸ Technological dominance is one of the elements that explain this. Free systems put their members in competition, and thus offer a strong incentive to come up with innovations that will not only allow to win the competitive battle for business inside the community, but that will also allow to dominate in clashes with other societies that lacked such innovations as they lacked such incentives. Thus, entrepreneurial incentives compared to central instructions, lead to more technological innovation – and this technological innovation allows to import wealth or to dominate on a geopolitical level.

Warfare was thus an important occupation of imperialistic states in the past, and technological innovation led to an advantage (still today, military expenses and procurement are an important source of early sales and thus of financing for technology driven companies).⁶⁹ Today, that technological innovation can bring wealth to a region when a country participates in global trade and commerce.⁷⁰ There is no perfect societal design but under pressure of globalization and imperialistic acts, there is a dominant design. Today, members of a society will discover the wealth of innovative and differentiating products that are available in the world, and they will want to participate in such globalized economy. It is too difficult to shield that influence away and to form a closed autonomous system – free market systems have thus become the de facto gold standard. And as free markets are the gold standard, the idea that technology-driven entrepreneurship should be fostered, is by extension a common goal among law- and policymakers worldwide.

3.2. The introduction of an endogenous role for technology, innovation and entrepreneurship in economic growth theories

The dominant understanding is thus that society can best reach the wealth-enhancing functions of technology, innovation and entrepreneurship through indirect support instead of centrally planned actions and direct market interventions. Coming to this conclusion took a substantial amount of academic discussion among macroeconomics. A short overview will be given here, starting at the moment that technology started to

⁶⁸ Thomas L Friedman, *The Lexus and the Olive Tree: Understanding Globalization* (Macmillan 2000).

⁶⁹ Stuart Hall, 'The West and the Rest: Discourse and Power' in Roger Maaka and Chris Andersen (eds), *The Indigenous Experience: Global Perspectives* (Canadian Scholars' Press 2006); Niall Ferguson, *Civilization: The West and the Rest* (Penguin 2011).

⁷⁰ Friedman (n 68).

gain an endogenous role in macroeconomics (namely under neoclassical models). Later, and thus more recently, entrepreneurship and innovation would also gain a role in macroeconomic reasoning.

It is normal that macroeconomic thinking (and thus also policy thinking) evolves. Social disciplines are young disciplines, and observational instead of experimental – resulting in constant changes of hegemony. Also, a second observation may deviate from a first observation as dynamics of society are beyond any individual's comprehension and actors can change their behavior. Theories use “stylized facts” and constantly frontrun empirical findings that will lead to adjustments and refinements. This causes dynamism in economic views.

Central to all the behavioral sciences is looking at the actions of humans. Different disciplines may come up with different explanations for similar situations. This should not surprise given the early state of these disciplines. Unlike natural sciences, humanities have various domains that study human behavior in a specific context and situation, and they all overlap: sociology, psychology, anthropology, economics, biology, etc. As a result, individual and group-based actions are studied in different disciplines and no academic domain has therefore the exclusive unified theory and understanding of the underlying motivations and mechanisms. Different disciplines put boundaries between each other, with a set of belief systems, to make the reasonings internally coherent – even if this may conflict with reasonings in other domains.

Economics is for instance defined as the study of the allocation of scarce goods (i.e. materials) to satisfy material wants⁷¹, which are therefore competing wants. There is overlap with other domains. Genetics are for instance also defined around competition, but then for survival. This selection can lead to conflict, due to the scarcity.

This boundary setting of the economic literature tends to abstract humans into very rational actors. A correction is often included in the definitions to exclude “nonmarket” behavior – namely that the many instances of non-rational behavior would then not be explained anymore within the discipline. However, policymaking, which follows models from this economic discipline, then start with an oversimplification by supposing that all human expectations are purely rational – thereby ruling out other prosocial or altruistic behavior. Reality has sometimes been sacrificed for abstraction and elegance. Other disciplines then study those cases of altruistic or less direct rational behavior (but this knowledge is then not used anymore in policymaking). However, even cases of altruism may be explained under extended and more indirect assumptions of rationality: rational choice theory tries to come to a coherent reasoning on the basis of rationality.⁷² It finds a solution in the existence of reciprocity. In recurrent exchanges – directly or indirectly– cooperation rather than self-interested behavior may be the most

⁷¹ Gilbert Ghez and Gary S Becker, *The Allocation of Time and Goods over the Life Cycle* (National Bureau of Economic Research 1975) <<http://www.nber.org/chapters/c3744.pdf>> accessed 3 March 2014. Albert Rees, 'An Essay on Youth Joblessness' (1986) 24 *Journal of Economic Literature* 613.

⁷² John Scott, 'Rational Choice Theory' in Gary Browning, Abigail Halcli and Frank Webster (eds), *Understanding contemporary society: Theories of the present* (SAGE 2000).

rationality optimal strategy. There is however a debate if human's nature is inherently selfish⁷³, or rather altruistic/prosocial.⁷⁴

In social sciences, it is also not unusual to use different units of reference: namely the individuals and their interactions versus the total group or society. The practice of aggregating the individuals' behavior to come to the group's behavior causes problems due to the abstraction that has been described above - if not all reference units behave according to the rational abstractions. The technique to maintain coherence even at the aggregate level, is assuming behavior "as if" it was always rational. Individual observations of individual non-rational behavior have then no or little influence on the aggregate level and are often described as instances of bounded rationality – a concept introduced by Herbert Simon.⁷⁵

Different disciplines have different understandings of bounded rationality:⁷⁶

- Law and economics balances being rational with the costs that it brings. For instance, information costs. Optimizing rational behavior is then limited by the marginal benefits, as a result of such costs.
- Behavioral law and economics recognize cognitive weaknesses in humans. We cannot compute all potential outcomes.⁷⁷ These limitations will however not stop humans from acting – but the behavior may sometimes be irrational. The method to undertake actions, despite these limitations, is often called heuristics.
- A third view considers the individual in its environment.⁷⁸ Individuals may lower their own rational behavior as this is in the group's interest (or is enforced by the group), and as he will indirectly and ultimately also benefit from such reduced rationality from others.

Recently, empirical literature has mainly started to criticize the theoretical models that overly make homogeneous assumptions on the rationality of the agents.⁷⁹ Hard and pure rationality is fading as the cornerstone of economic theory.

Economic theories are however also products of their eras. And exactly because social sciences have to work with observational data and not with experimental data, it also is subject to observing (and being biased) how agents are influenced by certain framework conditions and constraints that constantly change under never ending

⁷³ Adam Smith and M Garnier, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Nelson 1845); Thomas Hobbes, *Leviathan, or the Matter, Forme and Power of a Commonwealth Ecclesiasticall and Civil* (Yale University Press 1928); Richard Dawkins, *The Selfish Gene* (Oxford university press 2006).

⁷⁴ Martin A Nowak, 'Five Rules for the Evolution of Cooperation' (2006) 314 science 1560.

⁷⁵ Herbert Alexander Simon, 'Rational Choice and the Structure of the Environment.' (1956) 63 Psychological review 129.

⁷⁶ Gerd Gigerenzer, *Rationality for Mortals: How People Cope with Uncertainty* (Oxford University Press 2008).

⁷⁷ Christine Jolls, 'Behavioral Economics Analysis of Redistributive Legal Rules' (1998) 51 Vanderbilt Law Review 1653.

⁷⁸ Simon, 'Rational Choice and the Structure of the Environment.' (n 75).

⁷⁹ Eric Van den Steen, 'Rational Overoptimism (and Other Biases)' (2004) 94 The American Economic Review 1141; Daniel Kahneman, 'New Challenges to the Rationality Assumption' (1997) 3 Legal Theory 105.

dynamisms. For instance, Chandler's recognition of the need for coordination came at a time when mass production came up, and Schumpeter's innovation- and entrepreneurial-based theories came at a time when mass-production was less important.

3.2.1. Neoclassical economics and the recognition of technological advancement as a factor

For a long time, economist did not really focus as much on macroeconomic growth as they do today: for instance, in the first half of the 20th century, most attention was devoted to preventing market breakdown. For instance during the Great Depression, macroeconomic analysis became obsessed with unemployment.

Then, economic growth in a globalized but competitive world would become more understood for its role to enhance welfare. Classical theories would however not attribute any particular role to innovations. Instead, only more inputs (more working and more capital investments) were supposed to produce more outputs. Later however, they also started to suggest that technology could have a more profound impact on that growth, instead of just having a role of providing productive inputs (machines). The understanding came after the realization that output growth could not be explained by increasing inputs alone. Additional factors and inputs had been probed for their effect on growth⁸⁰, in order to explain the excess output. The availability of national income and product statistics would drive this trend and this increased concept of explaining growth and its factors.⁸¹ But once factors were found, there would be a nirvana approach that they could be altered in a very deterministic and cause-effect way. Later, I will see that the amount of uncertainties actually hinders such level of determinism.

Neo-classical growth theory acknowledged technological change as an explanatory factor⁸², among other factors like increasing returns to scale, investments in human capital, and the allocation of resources from lower to higher productivity activities. The Solow growth model is an example.⁸³

But neoclassical models would merely consider innovations as something that emerged according to some stochastic process (perhaps dependent on the amount of resources devoted to an activity). Given its role in economic growth, it became tempting to steer

⁸⁰ Jacob Schmookler, 'The Utility of Patent Statistics' (1953) 35 *Journal of the Patent Office Society* 407; TW Schultz, 'The Economic Development of Our Western Interior' (1953) 35 *Journal of Farm Economics* 707; Solomon Fabricant, *Economic Progress and Economic Change* (National Bureau of Economic Research 1954); John Kendrick, *Productivity Trends: Capital and Labor* (NBER 1956); Moses Abramovitz, *Resource and Output Trends in the United States since 1870* (National Bureau of Economic Research 1956).

⁸¹ Simon Kuznets, 'Economic Growth and Income Inequality' (1955) 45 *The American economic review* 1.

⁸² Richard R Nelson and Sidney G Winter, 'Neoclassical vs. Evolutionary Theories of Economic Growth: Critique and Prospectus' (1974) 84 *The Economic Journal* 886.

⁸³ Robert M Solow, 'A Contribution to the Theory of Economic Growth' (1956) 70 *The Quarterly Journal of Economics* 65.

this exogenous process, by increasing research and development. However, hereafter I will see that this does not automatically lead to innovations, or market adoption of new innovations, which is due to the existence of uncertainty.⁸⁴

3.2.2. *Schumpeter, creative destruction, and the recognition of entrepreneurs*

Institutionalists (e.g. Veblen), and economists like Schumpeter would view the process of innovation and economic growth as characterized by uncertainty, and as something that should be fostered indirectly – by providing institutions, or encouraging entrepreneurship respectively.

Neoclassical Economics was however entrepreneurless, and failed to consider a vector that could handle the uncertainties to improve technology advancement (through the process of experimentation).⁸⁵ There is now evidence that entrepreneurship is in aggregate (few successes, many failures) important for economic growth.⁸⁶ Entrepreneurs use technology-driven innovation to create competitive advantage and this brings and distributes wealth towards a region. Entrepreneurs also create other welfare effects, like job creation.

Entrepreneurs are vectors of innovation and technological diffusion. There's even a bidirectional relationships: technology stock offers entrepreneurial opportunities and entrepreneurs create innovation (often technical).

In recent years, several attempts have been made to include entrepreneurship in economic growth models. Schumpeter is most notable with the theory of creative destruction: entrepreneurs use creativity and innovation to destruct incumbents and those incumbents are forced to reorganize or to leave.⁸⁷ Competition is then endogenous, and it forces everybody to innovate for their survival. However, institutional obstructions and low levels of labor mobility may slow down the exits to a level that is suboptimal – and with less than optimal growth effects.

Since then, other growth theorists have tried to include innovation and entrepreneurship in their models, as an endogenous factor.⁸⁸ Evolutionary economics take for instance an experimental or natural selection approach to describe dynamics in an economy.⁸⁹ Successful entrepreneurs are selected, and failing entrepreneurs get isolated.

⁸⁴ Frank H Knight, *Risk, Uncertainty and Profit* (Courier Dover Publications 2012).

⁸⁵ Milo Bianchi and Magnus Henrekson, 'Is Neoclassical Economics Still Entrepreneurless?' (2005) 58 *Kyklos* 353.

⁸⁶ Ingrid Verheul and others, 'An Eclectic Theory of Entrepreneurship: Policies, Institutions and Culture' (Tinbergen Institute Discussion Paper 2001)
<<http://www.econstor.eu/handle/10419/85867>> accessed 3 March 2014.

⁸⁷ Joseph Alois Schumpeter, *Business Cycles* (Cambridge University Press 1939).

⁸⁸ Paul M Romer, 'Increasing Returns and Long-Run Growth' (1986) 94 *The journal of political economy* 1002; Robert E Lucas Jr, 'On the Mechanics of Economic Development' (1988) 22 *Journal of monetary economics* 3.

⁸⁹ Fulvio Castellacci, 'Evolutionary and New Growth Theories. Are They Converging?' (2007) 21 *Journal of Economic Surveys* 585.

But just like the uncertainty of technological advancement, entrepreneurship is above 'formalization' – it cannot mechanically or deterministically be created. It requires individuals that want to innovate and compete under uncertain circumstances.⁹⁰ A next frontier in law and policymaking is thus rather to foster such entrepreneurs, and to create a conducive environment (i.e. encouraging coordination infrastructure), instead of acting directly in the market. A next part should help to increase the understanding of the dynamics that such entrepreneurs face when they take an innovation to the market. Those dynamics will also reveal a substantial amount of uncertainty, which will justify partly why direct intervention is particularly unwise in this domain, with a few exceptions.

3.3. Evolution of government intervention, with a recognition for technology, entrepreneurship and innovation

Societies that do not rely on central planning, but where the decentralized agents can freely act, do thus also use some centrally planned or coordinated actions to enhance mutual interests. States are thus mechanisms to undertake collective action in situations where collective action problems exist (the production and enforcement of rules are a public good).

These systems range from night-watchman states to protect people from aggression, theft, breach of contract, fraud and other forms of negative externalizers to today's welfare states that also actively intervene to distribute or to maximize welfare and that foster positive externalizers (like technology-driven firms). The role of government has changed over time, from a passive role to a very active direct role to a rather indirect role today. This indirect role then fosters technology, innovation and entrepreneurship, as they are understood to be vectors of social welfare.

Also, although this free market system proved to dominate planned systems, it also implied that the least competitive agents in society were also most exposed to the most negative side of a competitive system. This is a problem that centrally planned societies did not have: namely the risk of losing out as an individual. Also the risk for economic bubbles, under the form of asset bubbles and the risk for system crises are present in free market systems. Social welfare states try to counteract this, in order to offer the best of both worlds.

3.3.1. Prevention against negative externalities (Smithian inspired)

In their most brutal form, such societies that rely on freedom of the decentralized agents, only provide a mechanism that protects against problems like negative externalizers, or tragedies of the commons. Thus, problems, where the misbehavior of a few could actually lead to a breakdown of trust for the rest of society that wants to

⁹⁰ Sander Wenekers and Roy Thurik, 'Linking Entrepreneurship and Economic Growth' (1999) 13 Small Business Economics 27.

interact with each other, or where the use of some common but unique resources required a coordinated approach as self-interest may lead to overexploitation.⁹¹ It is thus about preventing suboptimal individual actions, leading to zero or negative sums for other society members. These are nightwatch states.⁹² After all, entrepreneurial opportunities may as well expose negative externalities (crime or organized crime for instance) and not only positive externalities. Negative externalizers do not bear certain costs of their actions, and this cost accrues to third parties instead. This makes the payoff economically interesting. Another element for such basic form of government is the protection of property rights, at least for tangible properties as the most brutal form of free market is heavily based around physical goods. This should prevent that one actually has to manually protect property and that a fitter person can deprive others from property (it would take away the incentive to own and trade).

Once such negative externalities were prevented, there existed trust in the market and the “invisible hand” would lead to economic growth⁹³, as the actions with negative externalities have been filtered out and only those with positive externalities remain.

This most rudimentary form was the mainstream form until neoclassical economics theories dominated. The measures in such society can be provided through lawmaking, and through the provision of some institutions like courts and law enforcement. In an anonymous group, where also long-distance transactions can exist, these goals indeed required positive norms, and such rulemaking is considered as a public good. After all, the cost to create rules exceeds the reward that a single user can reap from it as others can free ride on it. Collective decision-making is a main reason of existence for states.

Although rules are a common good, which represents a collective action problem to create them, they can sometimes emerge organically, and costless. The cost for a private actor to think up a standard behavior (a norm) may be so marginal that it emerges anyway. The better the standard or norm, the more people that can adopt and imitate it – and that can slowly spread it through social interactions. The benefit for everyone is an expectational pattern, and those who do not follow the expectations can be excluded through social sanctions. This is of course limited to non-anonymous societies.

3.3.2. Prevention of market failures, to reach positive externalities

Societal systems have later incorporated the idea that internal growth can be spurred or optimized, instead of merely offering stability and preventing breakdown. Society acts as a beneficiary of positive externalities and spillovers. The chance of positive externalities and spillovers can thus be improved. For that, the notion of market failure

⁹¹ Garrett Hardin, ‘The Tragedy of the Commons’ (1968) 162 science 1243.

⁹² Walter JM Kickert and Jan LM Hakvoort, ‘Public Governance in Europe: A Historical-Institutional Tour D’Horizon’ in Oscar van Heffen, Walter JM Kickert and Jacques JA Thomassen (eds), *Governance in Modern Society* (Springer Netherlands 2000).

⁹³ Smith and Garnier (n 73).

was used.⁹⁴ A market failure is basically the inability of the market to efficiently and optimally distribute resources. The impact of negative externalities is just one such cause of market failures.

One market failure that was observed to have a negative social welfare effects, was monopoly abuses – especially when the economic rents create a social welfare cost.⁹⁵ Therefore, monopoly prevention is an example of another step in lawmaking. Other market failures were the underprovisioning of merit goods like innovation, or the observation that coordination of financiers and managers of undertakings could create substantial welfare. This new wave of lawmaking, to optimize social welfare, often boiled down to cases of balancing individual's protection and rights, with optimizing social advancement despite a potential risky impact on the level individuals.⁹⁶

Monopoly prevention is largely an exercise to balance the power of monopolies. Monopolies can be abused by deriving economic rents from excess market power, or by preventing market entrants. In general, excess market power causes the producer to under-produce from society's perspective (and exactly this allows excess profits).

On the other hand, society can benefit from eliminating duplicate costs. Allowing some level of monopolies has a positive effect. Railways can be given as an example of the latter type – duplicate tracks would be a serious cost as the efforts and investments can better be invested elsewhere in society.

This is thus a type of lawmaking that requires a balance between conflicting interests. Antitrust laws have been created to prevent monopoly rents, and some monopolies are kept in the hands of states.

Another balancing activity came from the creation of incentives to start economic activity, namely the systems of limited liability and standard equity. Protecting individual's interest may be a political choice, like creating the welfare state. But sometimes, the aggregate benefits may tip the balance in favor of a choice to prioritize the public interest, at the cost of some individuals. The creation of the concept of limited liability is an example of that. It offered the incentive to undertake (risky) economic activity, where such an incentive may otherwise be lacking due to risk-aversion. It incentivizes experimentation, which has in aggregate a positive outcome for society. Countries may even model their bankruptcy principles around this principle of experimentation: people who fail declare bankruptcy and then try again, perhaps fail again, declare bankruptcy again, and then try again, until succeeding. Company law is in general always a combination of enabling mechanisms for the market, and an instrument for economic and political goals.⁹⁷

⁹⁴ NA Barr, *The Economics of the Welfare State* (Stanford University Press 1993); Bronwen Morgan and Karen Yeung, *An Introduction to Law and Regulation: Text and Materials* (Cambridge University Press 2007).

⁹⁵ Katalin Judit Cseres, *Competition Law and Consumer Protection* (Kluwer Law International 2005).

⁹⁶ Robert E Goodin, *Reasons for Welfare: The Political Theory of the Welfare State* (Princeton University Press 1988).

⁹⁷ William W Bratton and Joseph A McCahery, 'The Equilibrium Content of Corporate Federalism' (2006) 41 Wake Forest L. Rev. 619.

The balance is made between creditor's rights and investor's rights: for instance: many states (still) have minimum capital requirements that acted as a buffer to protect creditors against firms that can now act in a more risky way (as the investors only benefit from the upside and do not feel the entire downside – thereby creating a one-way bet and thus an incentive to behave risky). Some may even say that this risky incentive is excessive, even for the aggregate level of society.⁹⁸ Some consider that the emergence of the limited liability principle increased the incentive for firms to act like an antisocial externalizer (at least as long as an act is not forbidden on normative grounds yet – like harming the environment).

Company law, that provides limited liability, also has a coordination function. It overcomes a coordination failure: by offering standard equity with limited liability and investor protections, a manager can take the lead to search investors under those default terms. Those terms are reasonably fair (i.e. investors receive an ownership stake and voting rights) to make it acceptable for members of the crowd who lack negotiated power. This allows a form of coordination between a large group of people that might otherwise lack the incentive or that might face a too high transaction cost to pool resources.

A third balancing exercise relates to property rights for intangible things (intellectual property). Another legal innovation was indeed intellectual property rights to have the right incentives to let private parties create welfare enhancing outcomes. They allowed creating merit goods that would otherwise be underproduced in society. The general understanding is that information is non-rivalrous and non-excludable, and it will therefore not be produced in enough quantities if no incentives are created.⁹⁹ Governments can provide it, or at least alter the price mechanism in this domain (i.e. public funding of universities) or they can create artificial property rights over it (i.e. intellectual property rights). In reality, there's a combination of both: fundamental knowledge is often produced by state-sponsored universities, as the intellectual property monopolization regimes do not yet apply there, and it is rather the applied knowledge that will receive the private R&D investment and that will apply for intellectual property protection.

However, such intellectual property monopolies also have a counterbalance: the monopoly can be so strong that some competitors may fail to bring products to the market that would create a social benefit. Too strong monopoly rights prevent socially optimal distribution and create societal cost of duplicate efforts or prevent other (more suitable) innovators of building on innovation, while too little monopoly rights do not create enough incentives to innovate.

A fourth action tried to improve trust, which can largely take place through information flows and not necessarily through ex-post mechanisms. The most rudimentary state systems –namely the Smithian ones– already offered ex-post enforcement mechanisms (potentially creating an ex-ante fear) to protect against fraudsters, this already helped

⁹⁸ Joel Bakan, *The Corporation: The Pathological Pursuit of Profit and Power* (Simon and Schuster 2005).

⁹⁹ Robert P Merges, Peter Seth Menell and Mark A Lemley, *Intellectual Property in the New Technological Age* (Wolters Kluwer Law & Business 2012).

to prevent market breakdown. However, this would even be improved by providing ex-ante mechanisms to protect agents from information asymmetries. For instance, financial regulations imposed public information when the public was addressed to raise funds.¹⁰⁰ This type of costly signaling was supposedly rather only available to firms that wanted to signal their good quality – and this mechanism thus prevented adverse selection in the market (ultimately leading to market breakdown). This will extensively be discussed in part two of this study.

3.3.3. *Direct wealth creation and redistributors to fuel growth (Keynesian)*

Later, governments actively tried to intervene in the market to try to increase societal wealth even more or at least to redistribute it. This has for instance been the case through ideas that were inspired by Keynes.¹⁰¹ This implies for instance government-sponsored infrastructure works to increase employment (as a vector of wealth redistribution). Welfare states have also used fiscal or parafiscal policy to redistribute wealth, and to incentivize wealth enhancing activities, for instance through unemployment support or through subsidies. This may create a level of comfort that can make a nation less competitive vis-à-vis more competitive economies.

Besides directly acting in the market, under this principle, governments were and are also active through the price mechanism and through the force of law to change behavior.

However, unlike infrastructure works, such government intervention in the market do not work well in all situations of innovation, technology and entrepreneurship, which are today recognized as major vectors of economic growth. These all rely on experimentation, and instrumentalist and deterministic government action are not well suited for that. I will discuss a much more indirect role hereafter.

Technological progress, innovation creation and market entry are too much subject to uncertainty and informational complexity that a central planner is not effective. Attempts of direct public actions can easily lead to over-regulation or distort the market.¹⁰²

The idea that the provisioning of infrastructure would also work in the domain of high technology, before the role of external uncertainties was realized, was for instance visible with the failed creations of clusters. They were for instance inspired by the

¹⁰⁰ Bruce Greenwald, Joseph Stiglitz and Andrew Weiss, 'Informational Imperfections in the Capital Market and Macroeconomic Fluctuations' (1984) 74 *The American Economic Review* 194.

¹⁰¹ Bruce Greenwald and Joseph Stiglitz, 'New and Old Keynesians' (1993) 7 *Journal of Economic Perspectives* 23.

¹⁰² See for instance: 'How Countries Go High-Tech' (*The Economist*, November 2001) <<http://www.economist.com/node/850773>> accessed 8 June 2012; 'The Fading Lustre of Clusters' (*The Economist*, October 2007) <<http://www.economist.com/node/9928211>> accessed 8 June 2012.

literature on regional innovation centers, by Michael Porter.¹⁰³ For instance, governments tried to build a university like Stanford, but organically grown complementary elements could not be replicated. Collaboration and other social interactions with complementary industry actors is an example. An instrumentalist policymaker could not instruct the emergence of that.¹⁰⁴ Relationships between complementary people could not easily be created and instructed top-down, unlike the infrastructure or the artificial installation of certain service providers. Also government provided venture capital providers arrived, as a form of artificially installed complementary actors. But it is still subject to debate if those attempts to lower the capital risk (and to make it more attractive for other investors as well to invest), create even larger distortions than they cured in the first place.

Professor Anna Lee Saxenian was one of the first to understand this importance of people, culture and connections.¹⁰⁵ Successful districts or clusters, like the Italian industrial districts, or like Silicon Valley, are especially explained in terms of the interfirm relationships (based on simultaneous competition and collaboration), rather than just their geographical proximity.¹⁰⁶ Also external elements are too uncertain or too organically grown to replicate: i.e. a culture of job hopping for instance (California barred non-compete agreements), a high appetite for risk taking, and the presence of conducive communities like professional networks that fostered easy information exchange and the creation of partnerings.

Just like a particular technology or innovation diffusion path is recognized by uncertainty, so is the spatial community that can spontaneously emerge around an industry. The mechanics of the genesis of a cluster are fundamentally different than those of the further development (the latter one can be fostered, for instance through mechanisms and infrastructures for cooperation and coordination among firms). This is also better to let national or regional economies specialize and benefit from economies of specialization in a globalized economy, instead of creating duplicate costs under “me too” politics.

3.3.4. Indirect fostering transactions and experimentations to fuel growth (Schumpeter, institutional economics)

The role of law-and policymaking ultimately became more indirect. Enablingism instead of optimization is now the dominant normative prescription for law- and policymaking, and it is a shift away from the previous attention at policymaking towards lawmaking. Policymaking may lead to laws being passed, but then they are normally aimed to shape the behavior of public and private agents. And I consider

¹⁰³ Michael E Porter, ‘The Competitive Advantage of Nations’ (1990) 68 Harvard business review 73.

¹⁰⁴ Stuart W Leslie and Robert H Kargon, ‘Selling Silicon Valley: Frederick Terman’s Model for Regional Advantage’ (1996) 70 Business History Review 435.

¹⁰⁵ AnnaLee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Harvard University Press 1996).

¹⁰⁶ Franz Tödting and Michaela Trippel, ‘One Size Fits All?: Towards a Differentiated Regional Innovation Policy Approach’ (2005) 34 Research policy 1203.

lawmaking as efforts that merely optimize the situation where private actors can engage in transactions (which may ultimately lead to a more positive private ordering and to the creation of industry ecosystems).

Not everything can be optimized due to the high number of combinatorial outcomes and the uncertainties of the secondary and tertiary (and further) effects. But even with indirect optimization, there is still too much focus on the optimization itself while the ultimate optimal outcome may not be reached or known.

This study will tackle a number of domains where governments should foster (instead of hinder) transactions and coordination mechanisms and institutions between the actors that actually undertake the experimentation to deal with the uncertainties. This goes further than merely creating trust through ex-ante and ex-post mechanisms, as it is also about coordination infrastructure like standards, associations, platforms and communities. Coordination failures are one of the market failures that received less attention. Although this study will mainly focus on government's role to foster the cooperation between private actors, it is believed that governments can additionally still usefully have these existing forms of intervention towards those actors that create societal wealth:¹⁰⁷

- funding/subsidizing research, investments and education
- providing tax incentives to reduce the capital risk of investing
- providing adequate intellectual property regimes for appropriation of development
- government procurement

3.4. Understanding the dynamisms of technology and innovation

Uncertainty and non-linearity are a main reason that policy- and lawmaking cannot control knowledge generation, technology generation, innovation generation and market adoption, or the links between them. Technically interesting innovations must somehow emerge and must somehow find their way into products with a compelling value propositions. Then, such products must somehow be absorbed in the market.¹⁰⁸ These steps are filled with uncertainty and are of a highly non-deterministic nature. This implies a high level of experimentation, which is together with heuristics a method to deal with uncertainty. The vector that is useful for creating such innovations, and diffusing them with efforts to let the market adopt them, is entrepreneurship. This entrepreneurial experimentation has the aggregate property to produce a number of successes, although individual attempts have an absolute uncertain outcome. Thus, encouraging entrepreneurship may be one of the elements with a positive effect, when the transfer from innovation to market adoption is too uncertain to influence directly.

¹⁰⁷ Based on S Coolsaet, *Samenwerking Tussen Kennisinstellingen En Bedrijven Inzake (onderzoeks) Resultaten: Intellectuele Eigendomsrechten, Conflicten En Interfaces* (Flemish Research Council (Vlaamse Raad voor Wetenschapsbeleid)(Ed) 2003).

¹⁰⁸ Christopher Scott Musso, 'Beating the System: Accelerating Commercialization of New Materials' (Massachusetts Institute of Technology 2004)
<<http://dspace.mit.edu/handle/1721.1/34813>> accessed 4 March 2014.

Other forms of encouraging experimenters will be discussed as well, like in domains of the production of knowledge and the production of inventions.

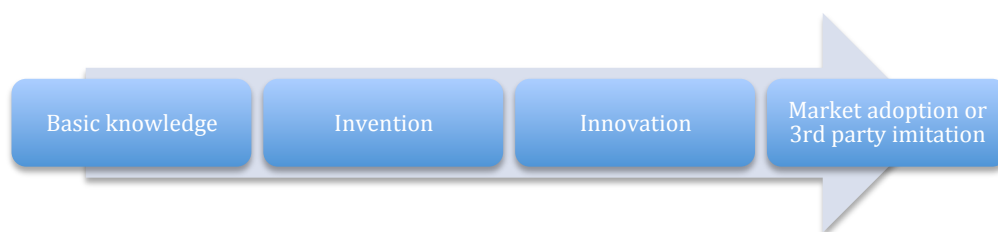


Figure 2: Linear path of innovation

A linear model of the path of innovation is often used. Initially, at least in the 1950s till mid 1960s, it was used in a push direction, as a waterfall from scientific discovery, through development in firms, to acceptance in the marketplace.¹⁰⁹ Since the mid-1960s and early 1970s, the realization came that a pull direction also existed, and it describes a process where market needs are solved by using the available stock of knowledge and innovations (often by combining and integrating different bodies of knowledge¹¹⁰). Market players can pick up innovations, for instance after observing underserved market needs, as they enhance their competitive position. Those needs give information to innovators for directing R&D efforts and the outcome can allow to do existing things better or less costly. Today it is however understood that there is a two-way interaction. Firms innovate both by pushing out innovations and by taking technologies from the stock knowledge.

3.4.1. *Non-linearity, complexity and uncertainties*

Uncertainty, for instance that technology will be picked up by an entrepreneur or that the market will successfully adopt an innovation, can be called Knightian uncertainty. Many successes are a result of accidental events (i.e. social interactions during market adoption, interaction of different scientific domains during innovation, etc.). Those are beyond analytical understanding.¹¹¹ And time horizons to resolve fundamental uncertainty can be quite long. Observations about success can often only be made in retrospect.¹¹² In the meantime, failure is the norm, not the exception.

The chances between the different innovation steps can even be illustrated like a funnel:¹¹³

¹⁰⁹ Roy Rothwell, 'Towards the Fifth-Generation Innovation Process' (1994) 11 *International marketing review* 7.

¹¹⁰ Lee Fleming, 'Recombinant Uncertainty in Technological Search' (2001) 47 *Management science* 117.

¹¹¹ Joseph Alois Schumpeter, *Theorie Der Wirtschaftlichen Entwicklung: Eine Untersuchung Über Unternehmengewinn, Kapital, Kredit, Zins Und Den Konjunkturzyklus* (Duncker & Humblot 1926).

¹¹² Richard T Rapp, 'The Misapplication of the Innovation Market Approach to Merger Analysis' (1995) 64 *Antitrust Law Journal* 19.

¹¹³ Robert G Cooper, *Generating Breakthrough New Product Ideas: Feeding the Innovation Funnel* (Product Development Institute 2007).

#:	Step:	Costs:	Payoff:
1000	Idea	R&D	negative
100	Prototype	Prototype	negative
10	Product	Product	negative or close to 0
1	Commercial success	Marketing	100

This understanding of uncertainty also limits of the actions that politicians can take successfully. Nonetheless, I will describe at the end of the chapter that some law- and policymakers may still fall for the fallacy that direct intervention in the market is capable of magic. Especially in Europe, there seems to be a level of nervousness of governments and policymakers: enough technological and scientific progress is available (at universities, research centers, etc.) to fuel the input of the innovation process of high tech and high growth companies. But measured to its inputs, the full wealth enhancing potential of innovation is not reached.¹¹⁴ This European situation can also be illustrated with the high measures on proxies that are commonly used: i.e. the high number of granted patents or the high amount of R&D spending.¹¹⁵ However, such proxies only measure the input to the innovation process, but say nothing about the success of market entry and the wealth that entrepreneurs capture.

The uncertainty is visible in the discontinuous or non-linear nature of some technological evolutions. They can even be described as revolutionary, rather than evolutionary. Their prediction is impossible, and consequently their emergence and diffusion can also not be controlled. Especially the cases of disruptive innovation, radical innovation and the particular case of general-purpose technologies will be discussed further. The latter type of discontinuous innovation even spawns innovations in the domain of applications, but they also create a very profound effect on industrial, economical and societal structures and infrastructures.¹¹⁶ Their breakthrough will follow the same type of dynamics of other technologies that will be discussed further. For instance, complementariness and learning effects will cause an initial inertia. There is also a co-dependency between the market adoption of general-purpose technology itself, and the application technologies that depend on it, as a form of positive network externality. The more applications that exist, the more is becomes interesting to switch to that general-purpose technology. General-purpose technologies act like platforms or “enabling mechanisms” for the complementary applications.

On average, every half a century, such technologies with broad societal impact get adopted. For instance, waterpower allowed an industrial revolution in 1770. In 1830, steam power would revolutionize transportation infrastructure (railways) and production capabilities. At the end of the 19th century, electric power allowed to mass-produce at production lines. Early 20th century, oil and petro chemistry would bring a number of profound innovations and most recently, at the end of the 20th century, information and communication technology led to digital communications and the

¹¹⁴ Elias G Carayannis and George M Korres, *The Innovation Union in Europe: A Socio-Economic Perspective on EU Integration* (Edward Elgar Publishing 2013).

¹¹⁵ Zoltan J Acs and David B Audretsch, ‘Patents as a Measure of Innovative Activity’ (1989) 42 *Kyklos* 171.

¹¹⁶ Timothy F Bresnahan and Manuel Trajtenberg, ‘General Purpose Technologies “Engines of Growth”?’ (1995) 65 *Journal of econometrics* 83.

Internet infrastructure.¹¹⁷ With each of these technological revolutions, new (application) industries arrive, and the infrastructure around it is completely redrafted.

Besides the notion of technological revolutions, the Kondratiev wave theory has also been used – although this concept links less to the technological underpinning of the discontinuous economical and societal changes. The idea is that new basic technologies (like general purpose technologies – with computers or biotechnology as examples) create new businesses and new markets. The expansions of businesses and markets create the rising part of a Kondratiev wave.¹¹⁸

3.4.2. *Government's role in increasing the science base, R&D, innovation and adoption*

Also, despite the unpredictability of the different steps, and the link between them, there is in retrospect however an undeniable relation between the accumulation at one level, and the emergence of positive outcomes at a next level. More fundamental knowledge allows more innovation. More innovation increases the chances of innovations that are accepted in the market. For instance, the invention of the steam-powered engine required the science base of the physics of gases and liquids. The telegraph was based on discoveries in electricity and magnetism.¹¹⁹ Experimentation and heuristics are the mechanisms that lead to successes in such situations of strong uncertainties.

This increase of chances for a positive propagation, and the understanding that experimentation instead of instructions are the most suitable mechanism, may also offer useful information on the type of government interventions that may work best. Building capacity in every block cannot be done with magic and direct instructions or planned actions from governments have little effect. Still, policymakers often have an instrumentalist view – especially in the domain of university research, where government-providing is the most effective (as I will describe in the next paragraph): intentions moved from national defense to industrial competitiveness and most recently to wealth creation. Still, it needs to go through the mechanism of experimentation, and it is therefore often more effective to foster private mechanisms that can handle to required level of experimentation.

Governments may help to increase the stock of fundamental knowledge. Once this stock of fundamental knowledge is increased, the chance that inventions may result also increases. The public good nature of fundamental scientific knowledge makes it a suitable subject for government sponsorship as a most suitable form of encouragement. This sponsorship is directed to universities where staff can experiment, and it is thus not a form of producing the knowledge directly (which is rather impossible given the unpredictable discovery nature). Without governmental help, a merit good as

¹¹⁷ Carlota Perez, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages* (Edward Elgar Publishing 2002).

¹¹⁸ Nikolai D Kondratieff, 'The Long Waves in Economic Life' (1935) 17 *The Review of Economics and Statistics* 105.

¹¹⁹ Frederick Betz, *Managing Technological Innovation: Competitive Advantage from Change* (John Wiley & Sons 2011).

fundamental knowledge would otherwise be insufficiently produced.¹²⁰ Such fundamental knowledge is after all excluded from intellectual property regimes that may otherwise act as an incentive for private production of such good. Also the early stage of the discovery process and the time to eventual (and uncertain) realization of long-term benefits, explains suboptimal provision if it would be left to private actors.¹²¹ Nonetheless, besides state-sponsored institutions, private R&D has in the past also produced fundamental knowledge – only to a societal suboptimal extend. Also, even with government sponsoring there may still be issues: the undersupply of students and academics in fundamental scientific areas for instance (i.e. due to stigmatization or the “unsexy” perception).

Governments must recognize their inability to instruct or plan which inventions will make it to marketable inventions or perhaps even marketable innovations. Still, to foster this transfer from fundamental knowledge to useable commercial inventions, those same knowledge producing universities have been offered the incentive to try developing fundamental knowledge further, by being allowed to capture the financial returns on intellectual property. This was the core of the Bayh-Dole Act in 1984 in the United States. Nonetheless, at the level of universities, one of the problems is often reluctance from academics to develop technologies towards commercial offerings. Governments have therefore also co-sponsored intermediate institutions (thus, partly publicly funded, partly R&D contract funded institutions). These are eventually linked to a university and have people that often have an express interest to commercialize, in contrast to the situations inside universities. Examples in Germany suggest a success of this concept.¹²² Such government co-sponsoring may also solve the problem that university developed knowledge may still have a too long time horizon to actually commercialize it, if it would be undertaken by a private firm.

Besides these government interventions, intellectual property regimes leave private parties with the task of experimenting during R&D to come to a marketable invention or innovation. Also, the step to actually take an innovation to the market is rather performed by entrepreneurs who experiment and try to let the market adopt such innovation. Governments have only a limited direct role to act in this uncertain domain, for instance by acting as an early buyer through public procurement.

3.4.3. The role of entrepreneurs in disruptive innovation

¹²⁰ Bronwyn H Hall and Josh Lerner, ‘The Financing of R&D and Innovation’ (National Bureau of Economic Research 2009) <<http://www.nber.org/papers/w15325>> accessed 23 March 2013.

¹²¹ John M Deutch, ‘What Should the Government Do to Encourage Technical Change in the Energy Sector?’ <<http://dspace.mit.edu/handle/1721.1/18089>> accessed 4 April 2013; Michael Peneder, ‘The Problem of Private under-Investment in Innovation: A Policy Mind Map’ (2008) 28 *Technovation* 518.

¹²² Mark Lehrer and Kazuhiro Asakawa, ‘Rethinking the Public Sector: Idiosyncrasies of Biotechnology Commercialization as Motors of National R&D Reform in Germany and Japan’ (2004) 33 *Research Policy* 921; Rajendra Prasad, ‘Emerging Paradigm of Strategic R&D Alliances Vis-À-Vis Corporate International Competitiveness’ (2004) 7 *Technology Experts* 1.

Entrepreneurs may see a business opportunity and create a market for a good or service, or screen the stock of available innovations to fulfill a market opportunity. Entrepreneurs and taking such innovative steps thus go hand in hand: it may be new products or services, but also new forms of organizing.¹²³ The newness, and untested nature implies a high level of risk, but if that effort is successful, then this diffusion of new technology will increase societal wealth and it will diffuse that wealth through spillovers and positive externalities (i.e. through employment). The societal function of entrepreneurs is thus one of experimentation in order to come to a natural selection of successful cases and to stop pursuing the unsuccessful ones. On aggregate, with the entrepreneurial failures included, there is still an aggregate positive effect for society.

Large established corporations may also exploit such market opportunities that entrepreneurs typically exploit, but they perform poorly at these experimental tasks. They are less responsive in contrast to small firms that can act on localized customer information in a more agile way.¹²⁴ Existing firms have also more to lose and may be more conservative. Managers of large incumbents often lack organizational processes and enough authority to undertake experiments. Large corporations have built business models around protected market shares that then offer high margins (i.e. through brand loyalty, economies of scale that keep out new entrants, lock in agreements). Diffusing innovations, with potentially low margins initially, may not fit this business philosophy as long as it is not needed to maintain competitive advantage. And even if it is needed for competitive advantage, some large corporations may choose to spin off entrepreneurial entities for this purpose, or may form contractual or equity alliances with such third party entrepreneurial firms. These are practices of corporate venturing and partnering. Potentially, they may have the objective of acquiring such entrepreneurial entity once the uncertainties and risks have been reduced.

Another delayed mechanism to reduce the uncertainty by letting a third party experiment with the innovation and the unpredictable market adoption before one steps in, is imitation. Cash-rich imitators can even continue from the point where capital restricted first movers fail to overcome their capital shortages to overcome a valley of death that the long-term market adoption may imply. It might be difficult to withstand the competitive advantage against imitators.¹²⁵ Second movers and innovators are often more successful at market entry than the original innovators. Also, they can often do it at a lower price, as they have to cover less innovation and market entry costs.¹²⁶ Although bad for the initial innovator, the second mover or the imitator brings the societal wealth that the initial innovator will fail to deliver then. From a societal point of view, imitating and later movers are still beneficial. It can be more important to business growth than innovation itself. Imitation is often the primary source of progress.¹²⁷

¹²³ Schumpeter, *Theorie Der Wirtschaftlichen Entwicklung* (n 111).

¹²⁴ Tidd and Bessant (n 19).

¹²⁵ Frits K Pil and Susan K Cohen, 'Modularity: Implications for Imitation, Innovation, and Sustained Advantage' (2006) 31 *Academy of Management Review* 995.

¹²⁶ Sharon A Alvarez and Jay B Barney, 'How Entrepreneurial Firms Can Benefit from Alliances with Large Partners' (2001) 15 *The Academy of Management Executive* 139.

¹²⁷ Oded Shenkar, 'Defend Your Research: Imitation Is More Valuable than Innovation' (2010) 88 *Harvard business review* 28.

Entrepreneurial firms often have to face the “valley of death”, as the innovation is not only costly and long to develop, but also the market adoption is long and uncertain. Overcoming this long timeframe requires access to capital. This requires especially capital from investors that are comfortable with the idea that an individual attempt to enter the market will most likely result in failure instead of a success. Only a portfolio of such investments can in aggregate increase the safety to obtain a positive payoff. Hereafter, I will describe how market adoption is dependent on long and unpredictable social interactions, learning effects and the emergence of complementary products, services and institutions.

First, it is important to understand that entrepreneurs use disruptiveness and niche markets to surprise incumbents. Sustaining innovations help to sustain the performance of a firm, and are the product of incumbent firms. Those firms are also better off than entrant firms for introducing such sustaining innovations. Entrepreneurs do however have an incentive to take the high risk to take an incumbent, if his rents are observed as sufficiently attractive to enter that market. If this works out well, then this can be described with the notion of creative destruction: a process of destroying the old to create the new.¹²⁸

Entrepreneurs, or risk-takers, can however have an outspoken advantage with disruptive innovations.¹²⁹ Contrary to existing products, such disruptive innovations have different attributes compared to existing technologies. Therefore, new entrants or incumbent firms start on the same terms for such technologies. But these attributes may make them less attractive for mainstream customers during market introduction (i.e. due to competition of existing and less expensive products with similar attributes). But existing technology cannot reach specific features, or not as good. Firms may find an initial market segment where buyers may consider those features worth the price difference compared to existing products – their subjective appreciation of the different attributes is thus more in favor for the disruptive technology. Subsequent developments may make the product however more attractive for the mainstream market.¹³⁰

An undertone of this theory is that incumbent firms may stay so focused to mainstream customers, because they also have an advantage there, that they completely fail when the disruptive innovations capture the mainstream market. Once these innovations reach the mainstream market, the superiority of a visionary innovation, and the appealing factor that it has to customers, may take such incumbent by surprise.

Secondly, after this understanding of market entrance dynamics that entrepreneurs use, we must understand their sources. Understanding their source also implies understanding a source of innovation, and a source of diffusors of disruptive innovations.

¹²⁸ Schumpeter, *Socialism, Capitalism and Democracy* (n 16); Richard L Nolan and David C Croson, *Creative Destruction: A Six-Stage Process for Transforming the Organization* (Harvard Business School Press 1995).

¹²⁹ Joseph L Bower and Clayton M Christensen, ‘Disruptive Technologies: Catching the Wave’ (1995) 73 *Harvard Business Review*.

¹³⁰ Vijay Govindarajan and Praveen K Kopalle, ‘Disruptiveness of Innovations: Measurement and an Assessment of Reliability and Validity’ (2006) 27 *Strategic Management Journal* 189.

If entrepreneurial entities are a key element to experiment in the creation of innovations, and the experimentation to diffuse innovations (which, if successful, makes this entrepreneurial entity an agent for economic welfare creation and diffusion), then a next question may be how to foster the emergence of entrepreneurs and their activity. After all, while the entrepreneurial activity offers a societal benefit in aggregate, on an individual level is failure more the norm than success. The risk and uncertainty that may be present before a positive payoff takes place may thus not be very attractive to risk-averse persons. Perceived self-efficacy is often a driver to start a risky business, instead of pure rational optimization (the latter may after all lead to a negative decision).¹³¹ Entrepreneurial orientation requires entrepreneurial mindsets.¹³² However, it should be noted that not every entrepreneur will be of the risk taking type. Some are much more risk averse, like individuals that become self-employed, or firms that enter into established and stable industries.

Some observations about sources of risk-taking entrepreneurs are for instance entrepreneurially rich environments (high tech clusters for instance). In such environment, risk taking and being entrepreneurial is the social norm, and that creates entrepreneurs. Social interactions (herding, bandwagon, inspiration, following, pressure) thus influence the availability of entrepreneurs. Available entrepreneurs inspire potential entrepreneurs. Many countries struggle with a cultural stigma, where entrepreneurs are not the norm at all and where the social sanctions on failure are so substantial that the inverse situation is true. When the environment is not forgiving for failed entrepreneurs, then this may prohibit them from starting a next venture for a next round of experimentation (which may have the same chance to deliver societal wealth). Besides monetary benefits, in some cultures and countries, entrepreneurs also receive praise (i.e. in the United States), which also acts as an incentive. Also if the environment is unforgiving, only low ability individuals are willing to start risky companies, and the pool of failed entrepreneurs may mainly consists of low quality entrepreneurs that cannot be financed profitably.¹³³ This stigma for failed entrepreneurs is sometimes also reflected in the insolvency laws, which can be very hostile against failed entrepreneurs. A direct link exists between the bankruptcy laws and the level of entrepreneurship in a country.¹³⁴

¹³¹ Norris F Krueger and Deborah V Brazeal, 'Entrepreneurial Potential and Potential Entrepreneurs' (1994) 18 *Entrepreneurship theory and practice* 91; Albert Shapero and Lisa Sokol, 'The Social Dimensions of Entrepreneurship' in Calvin A Kent, Donald L Sexton and Karl H Vesper (eds), *Encyclopedia of entrepreneurship* (Prentice-Hall 1982); Icek Ajzen, 'The Theory of Planned Behavior' (1991) 50 *Organizational behavior and human decision processes* 179; Fred Luthans, Alexander D Stajkovic and Elina Ibrayeva, 'Environmental and Psychological Challenges Facing Entrepreneurial Development in Transitional Economies' (2000) 35 *Journal of World Business* 95.

¹³² Mike Wright and others, 'Entrepreneurial Growth through Privatization: The Upside of Management Buyouts' (2000) 25 *Academy of Management Review* 591.

¹³³ Marco Da Rin, Thomas F Hellmann and Manju Puri, 'A Survey of Venture Capital Research' (National Bureau of Economic Research 2011) <<http://www.nber.org/papers/w17523>> accessed 22 February 2013.

¹³⁴ John Armour and Douglas Cumming, 'Bankruptcy Law and Entrepreneurship' (2008) 10 *American Law and Economics Review* 303.

Also existing organizations are known to spawn entrepreneurs among their employees¹³⁵, or to create spin offs or carve outs, like some sort of birth giving process. Such organizations may be universities, research institutions or companies. In case of spontaneous employee-driven initiatives to quit and continue an innovation outside the company, this also depends on the cultural mindset in a region. Legal rules governing employee departures clearly matter for this process.¹³⁶ California, where Silicon Valley is located, does for instance have a lax approach to trade secret enforcement, and to enforce non-compete covenants. This is just example of an area that has been reasonably covered by previous research.¹³⁷ This area of employment law, and its repercussions, will not be further discussed in this study.

Serial entrepreneurs, entrepreneurs who had started other ventures beforehand, constitute another important source of new ventures. In the 90s in the US, it was estimated that approximately 10% of all VC-backed founders were serial entrepreneurs.¹³⁸

3.4.4. Industrial dynamics

During market penetration, firms –often entrants– will often strive for high growth strategies to capture as much market share as possible, in a race with other entrants (or with incumbents). New product markets will attract a high rate of entry. However, many of those entrants will disappear during a later shakeout (for instance caused by adapting too late to a dominant standard), and then will there be some survivors.

Entrepreneurs that want to place innovative technology in the market, face a path dependency as incumbents have strong market positions (i.e. with customers locked-in) and this is only one of the reasons for the likelihood of failure. No matter how hard the

¹³⁵ Howard H Stevenson and others, *New Business Ventures and the Entrepreneur* (RD Irwin 1994); Paul Gompers, Josh Lerner and David Scharfstein, 'Entrepreneurial Spawning: Public Corporations and the Genesis of New Ventures, 1986 to 1999' (2005) 60 *The Journal of Finance* 577.

¹³⁶ April Mitchell Franco and Darren Filson, 'Spin-Outs: Knowledge Diffusion through Employee Mobility' (2006) 37 *The RAND Journal of Economics* 841; April M Franco and Matthew F Mitchell, 'Covenants Not to Compete, Labor Mobility, and Industry Dynamics' (2008) 17 *Journal of Economics & Management Strategy* 581.

¹³⁷ See for instance Ronald J Gilson, 'The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete' (1999) 74 *New York University Law Review* 575; Alan Hyde, *Working in Silicon Valley: Economic and Legal Analysis of a High-Velocity Labor Market* (ME Sharpe 2003); Christine M O'Malley, 'Covenants Not to Compete in the Massachusetts Hi-Tech Industry: Assessing the Need for a Legislative Solution' (1999) 79 *Boston University Law Review* 1215; Jason S Wood, 'A Comparison of the Enforceability of Covenants Not to Compete and Recent Economic Histories of Four High Technology Regions' (2000) 5 *Virginia Journal of Law and Technology* 14; Norman Bishara, 'Covenants Not to Compete in a Knowledge Economy: Balancing Innovation from Employee Mobility against Legal Protection for Human Capital Investment' (2014) 27 *Berkeley Journal of Employment & Labor Law* 287.

¹³⁸ Paul Gompers and others, 'Performance Persistence in Entrepreneurship' (2010) 96 *Journal of Financial Economics* 18.

efforts of the entrepreneurs, a number of external conditions will influence the diffusion of the technology.

Once market share has been captured, and the market is much less of a new growth territory, then more traditional reasoning steps in to protect rather than to capture market share, and to maximize profit: economies of scale (possibly through corporate restructurings like mergers and acquisitions), brand loyalty, lock in contracts with downstream players. In some markets however, constant innovation is necessary to maintain market share, especially when the industry continuously experiences the threat of disruptive innovators. Potentially, innovations may then rather be process innovations instead of product innovations.¹³⁹

3.4.5. Market entry dynamics

In general, the insertion, acceptance and diffusion of a new technology is a long and uncertain process, which exhibits a substantial amount of inertia. Social interactions and network externalities often play a substantial role. Those two mechanisms will be discussed next.

First, social interactions play a substantial role in the market insertion and diffusion of so-called disruptive innovation. The case of disruptive innovations has been introduced above and will be elaborated here. Insertion of such innovations happens through niche markets or segments that can place a higher subjective value on the innovation. Early adopters may for instance be governments, through public procurement. Consider for instance military spending towards Silicon Valley computer firms during wartime.¹⁴⁰

While entrepreneurial firms survive from such early buyers, inertia elements (as discussed hereafter) need to be overcome.

Early adopters however have a social interaction function. They will raise awareness and visibility, and they will also provide legitimacy (possibly fully unwittingly). Others, for instance those in close social proximity, may then also adopt.¹⁴¹ The triability is also increased once a few start to adopt it. And when an innovation needs a level of learning then it allows building capabilities in the market to use the innovation.

Often, the notion of an S curve of technology diffusion is used, with the group of adopters ever growing – starting with early adopters, early majority, late majority and laggards.¹⁴² Bandwagons may occur where an innovation is adopted because of pressure caused by the sheer number of those who have already adopted an innovation, rather than by individual assessments of the benefits of an innovation.

¹³⁹ Musso (n 108).

¹⁴⁰ Vernon W Ruttan, *Is War Necessary for Economic Growth?: Military Procurement and Technology Development* (Oxford University Press, USA 2006).

¹⁴¹ Everett M Rogers, *Diffusion of Innovations*. (Free Press of Glencoe 1962).

¹⁴² Ibid.

And once a technology has reached its mainstream market, a new emerging technology is starting to climb the curve already to replace it.¹⁴³

Then, network externalities often play a role in the growth path of a disruptive market. Alfred Marshall discussed “external economies” already in the end of the 19th century.¹⁴⁴ Marshall defined external economies as those that are dependent on the general development of an industry, in contrast to internal economies that depended on the firm’s own resources, organization, and management practices. Such network externalities have a mutual level of dependency as they each reinforce each other. These externalities also protect the established technology against possible invading new alternatives. Overcoming them implies a path dependency – a path that first needs to be altered and to be overcome. The more adopters and the more complementors there are, the lower those switching costs. If firms have the financial possibilities, then they can undertake investments to create co-specialized assets and capabilities.

An innovation may be very dependent on compatibility with existing processes, values, products, knowledge, practices, skills, equipment, etc. Those may be responsible for a high switching cost. The more complementarities that arise in the market, the lower the cost may be to switch to the innovation. Those costs may be so prohibitive; that a lock-in situation even exists that completely bars them from switching in the short run.

Value chain issues can be used as an illustration. To minimize value chain obstacles and insertion problems, especially in case of non-consumer or non-finished products and materials, entrepreneurs may choose to integrate or substitute in an existing value chain instead of shaping an entirely new value chain or value network. If compatible assets are lacking in the market, then a firm may need to acquire or produce them themselves.¹⁴⁵

Learning costs seem to be another common category of issues. Not only at the level of the customer. Learning allows letting potentially specialized service providers emerge. Such service providers may be specialized law firms¹⁴⁶, venture capital providers, etc. The service enablers that supply complementary services in the business ecosystem are another example of complementary factors.¹⁴⁷ The presence of such social tissue can be described as the existence of an ecosystem. Such ecosystem of complementary actors needs to co-emerge dynamically, and cannot be instructed despite numerous efforts of governments. Such ecosystems may be spatial, like clusters, but ICT has reduced the importance of proximity, except for the “sticky” elements like employees. Spatial clusters allow easy collaboration between firms there.¹⁴⁸ Colocation of firms and their

¹⁴³ Clayton Christensen, *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail* (Harvard Business School Press 2013).

¹⁴⁴ Alfred Marshall, *Principles of Economics* (Macmillan and Company 1890).

¹⁴⁵ David J Teece, ‘Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy’ (1986) 15 *Research Policy* 285.

¹⁴⁶ Lawrence M Friedman and others, ‘Law, Lawyers, and Legal Practice in Silicon Valley: A Preliminary Report’ (1988) 64 *Indiana Law Journal* 555.

¹⁴⁷ Michael A Cusumano, ‘The Changing Software Business: Moving from Products to Services’ (2008) 41 *Computer* 20.

¹⁴⁸ See for instance AnnaLee Saxenian, ‘Regional Networks and the Resurgence of Silicon Valley’ (1990) 33 *California Management Review* 89; Saxenian, *Regional Advantage* (n 105).

suppliers also benefits of locally concentrated and specialized labor markets, and the same is true for presence of a concentration of individuals and complementary service providers. There is however a risk for congestion - i.e. acute competition for labor and other production inputs. These benefits are also known as “agglomeration economies”.¹⁴⁹

Standards may help to overcome a coordination problem here. An important event in the process of market capture is the emergence of a dominant design.¹⁵⁰ Dominant designs can emerge organically, through market power, or through express standard setting with multiple parties. It is an essential point to turn switching costs in favor of the innovation. Once set, the path becomes increasingly channeled around the innovation. Dosi calls this a ‘technological trajectory’.¹⁵¹ Also, once such innovation has become a market standard, then there will emerge incremental innovations like improving processes.¹⁵²

Standard interfaces can allow task partitioning, especially when the standard is open. Firms can then experiment with different components that plug into the standard.¹⁵³ This increased level of experimentation, despite the individual uncertainties and risks, also increases the level of successful innovation outcomes.

In the last part, I will describe how governments can have a role in sponsoring private infrastructure to set standards to overcome coordination failures. This study will also discuss other forms to overcome coordination failures. Markets require for instance conductive infrastructure where information can flow.

3.4.6. The notions of radical and incremental innovation, and breakthrough technologies

As defined by Leifer et al., radical innovations are different from the disruptive innovations that have been used until now.¹⁵⁴ Disruptive innovations were supposed to struggle in an uphill battle to reach the mainstream market. However, some innovations find their way to the mainstream market instantly. To describe that situation, radical innovations can be used. Those are not inferior or costlier to existing substitutes in the market, and they can readily offer superiority or a compelling value proposition. This

¹⁴⁹ Marshall (n 144).

¹⁵⁰ James M Utterback, *Mastering the Dynamics of Innovation* (Harvard Business School Press 1996).

¹⁵¹ Giovanni Dosi, ‘Sources, Procedures, and Microeconomic Effects of Innovation’ (1988) 26 *Journal of economic literature* 1120.

¹⁵² Philip Anderson and Michael L Tushman, ‘Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change’ (1990) 35 *Administrative Science Quarterly* 604.

¹⁵³ Richard N Langlois and Paul L Robertson, ‘Networks and Innovation in a Modular System: Lessons from the Microcomputer and Stereo Component Industries’ (1992) 21 *Research Policy* 297.

¹⁵⁴ Richard Leifer, *Radical Innovation: How Mature Companies Can Outsmart Upstarts* (Harvard Business School Press 2000).

goes together with the notion of a technological breakthrough.¹⁵⁵ A radical innovation combines the technological properties of technology breakthroughs, and the dramatically higher attractiveness towards all clients. The originators of the concept contrasted this to incremental innovations that only involve minor technological advancements or that only have marginally higher attractiveness towards (some) customers.

A breakthrough product can due to its superiority be described as a gamechanger or killer app as well. It can capture the imagination of the world. Such innovation is often the only sort of innovation that can guarantee the survival of a young high tech company, as it may be the only type of innovation that can capture the market fast enough, and with less inertia from the market entry dynamisms that have been described above, before financial constraints may put the young company in distress.

3.4.7. The case of specialized service providers, instead of product market players

The descriptions of disruptive innovations, radical innovations and general purpose technologies all relatively implied a point of view of an entrepreneur or other type of firm that would bring a product to the end market. But besides direct end market entry, small entrepreneurial firms can also benefit from economies of specialization with their small scale. In some industries we witness an emergence of such specialized entrepreneurial firms, but the interface with the customers may still be in the hands of incumbents who bring the innovation to the market (like in the case of pharmaceutical firms). Each technological era has its paradigms. Before, the paradigms relied on mass production/mass markets, economies of scale, commoditization and vertical integration. Today, there is a trend towards decentralized firms, adaptability, agility, customization, knowledge intensity, and economies of specialization.

However, with the arrival of specialized entities, it should be noted that not all entities position themselves as innovators in end customer markets. Firms may lack superior access to complementary assets (externally or internally), and may consider selling or licensing the technology. Some may also specialize in R&D services, or performing subcontracted but knowledge intensive services. Then, such firm may need less access to capital to cover the otherwise long unprofitable time horizon and market penetration. Or the profits of the specialized activity can even be used as a bootstrapping form of capital to ultimately enter the market with a proprietary product. Such “project companies” have then also been called “soft startups”.¹⁵⁶ A disadvantage may be that the time-to-market increases and that it may take a long time before one may realize that it may result in a failure. The time wasted before realizing that resources should be invested in experimenting with other ideas, may be high.

¹⁵⁵ Rajesh K Chandy and Gerard J Tellis, ‘Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize.’ (1998) 35 Journal of Marketing Research 474.

¹⁵⁶ David Connell and Jocelyn Probert, ‘Exploding the Myths of UK Innovation Policy: How “soft Companies” and R&D Contracts for Customers Drive the Growth of the Hi-Tech Economy’ (Centre for Business Research, University of Cambridge 2010).

Also many large established firms changed their business model towards a specialized service provider. Some large firms have become a coordinator between other decentralized partners and their clients, and they sell more customized solutions to their clients. Such firms that changed their business model to such a sort of coordinator are a perfect demand side for such small and specialized services providers, while they may also be a perfect supply side for some complementary resources that entrepreneurial firms in general lack. This offers thus plenty of opportunities (and needs) to partner, but I will see in the last part that the legal and market infrastructure for partnering may be underdeveloped.

Firms may want to access specialized external providers in order not to incur the risks, uncertainties and time that in-house development would require. However, some firms may suffer from the “not invented here syndrome” if they source technology externally.¹⁵⁷ But in a rapidly changing landscape (technology- and business-wise), it has even become impossible for large firms to maintain and create in-house knowledge on all levels. Some literature describes this as the fact that no firm can be an island anymore.¹⁵⁸

3.5. Technological advancement and the individual, societal and economic advancement

Until now, technological advancement was praised for its positive impact on economies, whereby those economies had a positive impact on the lives of citizens. How this positive impact on citizens was distributed, varied according to the social system in use. Economic positive externalities and spillovers are mainly considered as the driver of welfare distribution. But technology as such also positively affects individuals and societies directly. Yet alone for that reason is it worthwhile to facilitate technological and innovative development and diffusion. This still boils down to improving the same conditions as discussed before: fostering entrepreneurial firms, reducing transaction costs, fostering private market infrastructure, etc. The economy is even a vector for technological diffusion itself. The relationship is thus bidirectional.

The direct impact of technology on society can be illustrated by the role of shaping tools in the beginning of human civilization. The different stone ages are for instance defined on the basis of the technology that people possessed or mastered (stone, bronze and iron).¹⁵⁹ Technology has always been an important element in civilization. It helped to change the world around us, in the way we wanted it: to make things, to communicate,

¹⁵⁷ Ralph Katz and Thomas J Allen, ‘Investigating the Not Invented Here (NIH) Syndrome: A Look at the Performance, Tenure, and Communication Patterns of 50 R & D Project Groups’ (1982) 12 R&D Management 7.

¹⁵⁸ Robert Gibbons, Richard T Holden and Michael Powell, ‘Firms In Markets Under Uncertainty’ (Cambridge, MA; Alfred P Sloan School of Management, Massachusetts Institute of Technology 2009) Working Paper <<http://dspace.mit.edu/handle/1721.1/66948>> accessed 28 May 2014; Håkan Håkansson and Ivan Snehota, ‘No Business Is an Island: The Network Concept of Business Strategy’ (1989) 5 Scandinavian Journal of Management 187.

¹⁵⁹ Kathy D Schick and Nicholas Toth, *Making Silent Stones Speak: Human Evolution And The Dawn Of Technology* (Simon and Schuster 1994).

to transport, etc. The changes may relate to survival needs such as food, shelter, mating or defense, or they may relate to human aspirations such as knowledge, art, or control (which may under some interpretations also be explained with a reproduction affinity).¹⁶⁰

Technology freed us up from the most basic survival needs, and made us more productive so we can spend our time on different interests. The question why we still work hard then, despite technology, can be explained by our globalized exposure to means to fulfill our desires. For instance, many decades ago, it was believed that technology would result in something that would allow us to drastically reduce the time that we need to work to perhaps 14 to 15 hours a week.¹⁶¹ The consumerism boom goes also hand in hand with globalization. Global trade, and imports and exports also influence the relative value of currencies and consequently the buying power. In order to maintain the same buying power to be able to buy consumer goods that have been produced abroad, countries need to maintain balanced levels of output as well – which requires a workforce that invests a sufficient amount of time (and thus more than 14-15 hours). People tend to compare their wealth with others. If other regions in the world would produce more wealth, then people here would be willing to increase their productivity as well, to have the same buying power on the global market.

Technology does not only advance humanity, it also fundamentally impacts social structures. Earlier, I described how general-purpose technology might fundamentally alter the structure across a society and economy.

Science and technology do not only serve as vectors or agents for economical or societal changes (and improvements), they have been also used to solve fundamental human problems. For instance, technological dominance allowed winning imperialistic wars. Today, in our globalized world, fundamental group issues have more to do with climate change and food security. The earth's population has already doubled three times during the past century and the human presence represents a stress factor on the planet. Techno-fixes may tackle some of those global challenges. Technological can thus also be considered as a form of solutionism.

Technology can also create abundance for a number of things that we simply need to survive or to prevent becoming trapped in poverty traps or in high levels of dependency. Besides the general advancement of humanity, and the ability to fix existential challenges, technology can also reduce poverty. Poverty reduction does not always necessarily have to be under the form of providing wealth and goods (food and drugs to start with). It can also be through empowerment. The impact of information and communication technologies, particularly radio and television, is known. They are tools for informing and educating the poor. ICT adds new forms of “many-to-many” communication and can bypass traditional power relations. Better communication can for instance allow that groups can organize themselves.

It is only when technology has been diffused enough, that it can be provided at a cost that is affordable for the poor (provided that no artificial rent-seeking mechanisms are

¹⁶⁰ F James Rutherford and Andrew Ahlgren, *Science for All Americans* (Oxford University Press 1991).

¹⁶¹ John Maynard Keynes, *The Pure Theory of Money* (Harcourt, Brace and Company 1930).

in place to keep prices high: patents, lock-in agreements with downstream distributors to keep market share and consequent to prevent price wars, etc.). The global poor are otherwise not yet sufficiently integrated with the mainstream globalized markets. This disconnect often results in their exclusion from the benefits of globalization. Many commercial offerings also cater to the needs of the wealthy customers. The challenge of offering products for the globally poor has only recently seen any form of attention¹⁶², although many producers also actually lack information on their needs to be able to cater to them.

4. Costs, failures and inadequacies from governmental actions

The previous title was necessary to understand the goals and motivations of the rule- and policymakers. Their intervention could be under different forms: providing legal infrastructure, acting in the market itself, providing or sponsoring market infrastructure, etc. The provision of state provided mechanisms and rules –ultimately a form to overcome coordination failures– comes at an overhead cost. Also, the delegation of decision power to politicians may incur agency problems: the interests may not be aligned with the public. Finally, due to bounded rationality and the combinatorial explosion of outcomes in a world that is recognized by uncertainties, some efforts may lead to an unintended effect.

Here, I will describe those difficulties that come with law- and policymaking, and that should be kept in mind. It may be necessary to accept that some levels of optimization cannot be reached with planning and that private experimentation and heuristics may offer better tools. Some market-driven mechanisms with a similar function may also help to solve the failures that law- and policymakers want to address, and may even outperform government-provided ones.¹⁶³ Therefore, infrastructure may sometimes also better support market-driven initiatives.¹⁶⁴

4.1. The overhead cost of collective decision making: public choice theory

Binding legal rules and law enforcement are a public good. Providing them requires overcoming a collective action problem.¹⁶⁵ Governments are a continuous mechanism

¹⁶² For instance in the pharmaceutical domain: Sarah Boseley, 'Big Pharma Ups Its Game in Providing Drugs to People in Poor Countries' *The Guardian* (28 November 2012) <<http://www.theguardian.com/global-development/2012/nov/28/big-pharma-drugs-poor-countries>> accessed 28 May 2013.

¹⁶³ Joseph A McCahery and Erik PM Vermeulen, 'Venture Capital beyond the Financial Crisis: How Corporate Venturing Boosts New Entrepreneurial Clusters (and Assists Governments in Their Innovation Efforts)' (2010) 5 *Capital Markets Law Journal* 471.

¹⁶⁴ Joseph A McCahery and Erik PM Vermeulen, 'Triple Helix Strategies in High Tech Clusters: One Size Does Not Fit All' <<http://www.biginnovationcentre.com/Assets/Docs/Triple%20Helix/Papers/Theme%207/Vermeulen.pdf>> accessed 8 May 2014.

¹⁶⁵ Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press 1990).

to organize the financing of such process, and thus to overcome such problems. No incentive should be searched anymore to overcome the individual costs to participate in an ad hoc rulesetting structure. Now, a cost is rather related to running such ongoing and permanent mechanism. One can call this the overhead costs of a structure.

Direct participation systems exist, but may come at a higher cost than mechanisms where power has been delegated to politicians. However, information technology today allows citizen participation in policy formulation at a much lower cost than before. This technology cannot only serve to assure transparency, but also to hear multiple voices. Also, while delegation comes at lower overhead cost, it also means that decentralized information is less available or is less acted on. Direct participants are more able to use that localized information. Due to the ability to better process localized information, judge made law, is often considered as an efficient mechanism for rulemaking. This idea was initiated by Coase in 1960, and later extended by Posner, and is now known as the efficiency of the common law hypothesis.¹⁶⁶ Judicial law production is also more immune from some weaknesses of delegated systems that I will describe here. For instance, pressure from interest groups can be less effectively directed to judges.

For delegated systems, once established, operational costs of a delegated system are the costs of running a parliament, the costs of external policy advice, the cost for organizing the elections periodically, etc. Those are however only the most visible costs and a large number of indirect or hidden costs –and public choice failures– will be discussed further.

Even once rules have been designed, information costs may exist to access those rules. Especially in case of rules with much specificity. Laymen may start to have a perception of overcomplexity, duplication and inconsistency. It may even increase the cost of external counseling to comply. Once the amount of rules grows, there may be an increase in uncertainty – and an associated level of anxiety and cost. That can for instance be a reason for SMEs to limit the number of employees to a minimum, to prevent exposure to complex rules. Behavioral economics may explain how agents react to such circumstances, and how rules are presented and perceived.

4.2. Failures in proactive rulesetting: political economy, misaligned incentives, pressures and bounded rationalities

Many law- and policymaking system function through delegated decision makers. A consequence is therefore also the potential suffering from agency problems. Media oversight and political checks and balances like the balance of powers help to prevent that – while reputation and transparency keeps politicians accountable to citizens. Despite those ex-ante prevention and ex-post sanctioning mechanisms, I will still describe the problems that a political system may bring. This will also include other potential sources of problems besides agents' self-interests.

¹⁶⁶ Francesco Parisi, 'The Efficiency of the Common Law Hypothesis' in Charles K Rowley and Friedrich Schneider (eds), *The Encyclopedia of Public Choice* (Springer 2004).

One of the most obvious problems is that individual lawmakers may still fall for the fallacy that “planning” will actually work. Some call it the “Nirvana” approach to policy¹⁶⁷, while others call it the alleged “positive transformative effect” doctrine.¹⁶⁸ Unfortunately, it has been described earlier that law- and policymakers may not be able to steer markets. But the attempt and the idea often surfaces. This may for instance be under the form of an attempt to replicate high tech clusters, to improve a region (i.e. regional development policies).

This fallacy may or may not be driven by politician’s self-interests. Self-promotion for instance (a form of signaling), instead of genuinely optimizing social welfare. Politician’s efforts may be a reaction to pressure from some groups that pointed out about inefficiencies and that expressed a demand to “do something”.¹⁶⁹ Especially in cases of incomplete markets, there is often a popular demand that a government would directly supply in the economy. The self-interest may also be caused by the adherence to political parties, who have strong interest in self-preservation and power preservation – possibly at the expense of taking decision in the interest of social welfare or to accept politicians that would take such decision.¹⁷⁰ Politicians may also have an interest to comply with demands from agents with an economic interest that may seek regulatory capture or that may aim for legislative rent-seeking. Lawyers have often been seen as such group, although lawyers are today also seen as facilitators.¹⁷¹ Young technology-driven firms usually lack the power or the coordination to influence politicians.¹⁷²

These planned efforts are rarely successful. Not only prevent uncertainties the success of it, it also creates duplicate costs on a global scale. Maximum instead of minimum legal intervention even increases the chance for barriers (government failures) for market-driven private initiatives and innovations that may want to emerge in the future.

Besides the uncertainties and the combinatorial explosions, there are other reasons why planned efforts may end up in government failures, irrespective of the good or bad

¹⁶⁷ Harold Demsetz, ‘Information and Efficiency: Another Viewpoint’ (1969) 12 *Journal of Law & Economics* 1.

¹⁶⁸ Erik PM Vermeulen and Diogo Pereira Dias Nunes, ‘The Evolution and Regulation of Venture Capital Funds’ (2012) *Lex Research Topics in Corporate Law & Economics* 2012-1 <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2163193> accessed 18 April 2014.

¹⁶⁹ Ibid.

¹⁷⁰ Charlie Stross, ‘Political Failure Modes and the Beige Dictatorship’ <<http://www.antipope.org/charlie/blog-static/2013/02/political-failure-modes-and-th.html>> accessed 12 December 2012.

¹⁷¹ Joseph A McCahery and Sol Picciotto, ‘Creative Lawyering and the Dynamics of Business Regulation’ in Yves Dezalay and David Sugarman (eds), *Professional Competition and Professional Power* (Routledge 1995).

¹⁷² Joseph A McCahery, Erik PM Vermeulen and Priyanka Priydershini, ‘A Primer on the Uncorporation’ [2013] ECGI-Law Working Paper <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2200783> accessed 28 February 2014; Joseph A McCahery, ‘Comparative Perspectives on the Evolution of the Unincorporated Firm: An Introduction’ (2000) 26 *The Journal of Corporation Law* 803.

intentions. People are subject to constraints. For instance time constraints¹⁷³, but also reasoning constraints. The latter is often called bounded rationality.¹⁷⁴

Even if an optimal outcome may exist (which is improbably, due to uncertainties), then it may be impossible to reach it due to such limitations at the level of individuals to deal with an explosion of potential consequences and outcomes. Experimentation and heuristics may then reach a reasonably good outcome, given the constraints.¹⁷⁵

Many fallacies emerge from oversimplified assumptions. For instance, oversimplification of the external uncertainties. But there may also be an excessive form of abstracting the characteristics of some elements. For instance private agents may be perceived as overly homogenous or as overly rational. This has led to “one size fits all” regulations. Another result may be that a particular structure or process becomes deeply entrenched and all different other setups that the market may develop are then hindered. Another simplification may be the assumption of a static market situation (and not taking into account the potential for future innovative changes in an industry landscape). A final example of an oversimplification may be the assumption of an overly linear innovation model.

4.3. Reactive rulemaking: discontinuities and path dependencies of rule- and lawmaking

Even without planning fallacy, there is a substantial role for the outside pressure on the creation of laws and policies. Reactive regulations often tackle the negative effect of a market behavior, but rather after a shock. This shock then serves as a pressure on politicians to “do something” or as an impetus for a new round of regulatory reforms. Most rulemaking is effectively reactive, and follows the economic cycles or financial scandals.¹⁷⁶ The recent Alternative Investment Fund Manager Directive is an example of that.¹⁷⁷ Such rulemaking typically also clearly occurs during shocks and crises, but also during periodical downturns in normal economic cycles. An availability bias and a panicky and uninformed surrounding mood then often dictates the form that rulemaking will take.

¹⁷³ David JT Sumpter and Stephen C Pratt, ‘Quorum Responses and Consensus Decision Making’ (2009) 364 *Philosophical Transactions of the Royal Society B: Biological Sciences* 743.

¹⁷⁴ Gerd Gigerenzer and Reinhard Selten, *Bounded Rationality: The Adaptive Toolbox* (MIT Press 2002).

¹⁷⁵ Gerd Gigerenzer and Christoph Engel, *Heuristics and the Law* (MIT Press 2006).

¹⁷⁶ Joseph A McCahery and Erik PM Vermeulen, ‘Corporate Governance Crises and Related Party Transactions: A Post-Parmalat Agenda’ [2005] Amsterdam Centre for Corporate Finance Working Paper

<<http://www.accf.nl/pages/members/mccahery/corp%20gov%20crises%20and%20related%20party%20transactions.pdf>> accessed 8 May 2014.

¹⁷⁷ Dirk A Zetzsche, ‘Overview, Regulatory History and Technique, Transition’, *The Alternative Investment Fund Managers Directive* (Wolters Kluwer Law & Business 2012).

When reactive regulations are implemented, they often entrench a system that has emerged until then. They easily overregulate and they can then however hinder market-driven innovations that do not follow this entrenched model.

Situations where this path dependency will be very visible, is for instance the domain of securities regulations that will be discussed in the next part, to regulate an ecosystem to channel money from the public towards companies (the market of primary offerings) and to organize liquid markets for company stocks (the market of secondary trades). Today, disintermediated internet platforms are however facing securities regulations that embed an intermediated business model.

Path dependence may thus lead to inefficient outcomes. However, it can take until a next culmination of outside pressure before a transition to more adapted rules may take place. In the meantime, as long as transition to more efficient rules is too costly, less efficient but path dependent rules may persist.¹⁷⁸

In fact, reactive regulations often kick in when it is effectively already too late. Then there's the risk that it extends the negative situation. This happened for instance after the credit crunch of 2008: regulations (Basel III) further reduced credit availability at a moment that credit had already collapsed, while economic recovery actually required credit to let the economy expand again.¹⁷⁹

There is however a general understanding that financial markets have an endogenous tendency towards destructive crashes.¹⁸⁰ And the most recent events will not necessarily be the events that will lead to the next shock.

4.4. Indicators of legal failures

Despite the good intentions, laws may thus have a bad or overly complex effect. An indicator for the quality of a set of legal rules can be the amount of deviations that parties take from the rule (if it concerns a default rule), or the amount of litigation and judicial uncertainty that arise over the years (if it concerns a mandatory rule). Also in civil law systems can courts offer a useful role to observe the rate of disputes and to monitor the rate of opt outs. As inefficient rules represent a cost for the parties that are subject to them, they may have a stake in disputing them.¹⁸¹ And a high number of parties that take to effort to opt out, shows a failure in the intention of a rule.¹⁸²

¹⁷⁸ Mark J Roe, 'Chaos and Evolution in Law and Economics' (1996) 109 Harvard Law Review 641.

¹⁷⁹ Bill Allen and others, 'Basel III: Is the Cure Worse than the Disease?' (2012) 25 International Review of Financial Analysis 159.

¹⁸⁰ Brett McDonnell, 'Dampening Financial Regulatory Cycles' (2013) 65 Minnesota Legal Studies Research Paper <<http://www.floridalawreview.com/wp-content/uploads/8-McDonnell.pdf>> accessed 28 May 2014.

¹⁸¹ George L Priest, 'The Common Law Process and the Selection of Efficient Rules' (1977) 6 Journal of Legal Studies 65.

¹⁸² Parisi, 'Sources of Law and the Institutional Design of Lawmaking' (n 59).

Other proxies may be the amount of economic actors that offers assistance in evading rules. This applies especially to tax domains. However, in the next part, I will for instance describe how a large number of crowdfunding platforms try to evade securities regulations.

4.5. Law- and policymaking as a demerit good?

Law- and policymakers' actions are only indirectly contributing to an increase in the economic welfare that is produced. Still, the number of law- and policymakers may be very high compared to the number of innovators in an economy. Together with the need for compliance service providers, they may outnumber the innovators. A similar problem is often visible in the domain of finance, where the economy is often servicing the finance domain instead of vice versa (certainly when it is a zero sum activity like financial speculation). The employment attractiveness may lead to a brain drain from the producing economy.

Some rules may create a rent seeking opportunity for some economic actors, who potentially already acted as a pressure group to implement such rules. Then, this effect is even reinforced. For instance, Murphy et al. observe that a high level of engineers has a positive impact on economic growth, while a large number of lawyers have a negative effect.²³ The reason is in their observations attributed to a high level of rent-seeking. However, a milder vision may be that despite their transaction cost reducing function, that it is still a unit of manpower that is not active in producing exportable output.

4.6. Lawmaking to accept market innovations and legal pluralism

As law- and policymakers should recognize the boundaries of their potential to optimize an economy, they should also recognize that private systems often have the best insights into how a failure could be improved. Better and closer insight into systems was also one of the reasons that governments started to develop specialized agencies and commissions to regulate some economic activities (i.e. securities regulators, after the model of the American SEC as designed by professor Landis¹⁸³).

Some market infrastructures are sometimes more efficiently produced by the private sector. However, their public good nature may justify some governmental help or recognition.¹⁸⁴ In the last part, I will for instance describe how private partnering platforms may fail to arise without governmental sponsorship.

Private initiatives should also not be overly hindered by existing and overinclusive regulations as experimentation and learning-by-doing may often lead to a better

¹⁸³ Anne M Khademian, *The SEC and Capital Market Regulation: The Politics of Expertise* (University of Pittsburgh Press 1992); Bevis Longstreth and Joel Seligman, 'The SEC after Fifty Years: An Assessment of Its Past and Future' (1983) 83 *Columbia Law Review* 1593.

¹⁸⁴ RA Epstein, 'The Pharmaceutical Industry at Risk: How Excessive Government Regulation Stifles Innovation' (2007) 82 *Clinical Pharmacology & Therapeutics* 131.

outcome than top-down law- and policymaking may be able to obtain. It is a form of heuristics, and thus a form to deal with situations with many combinatorial outcomes.

It is actually an illustration that law- and policymakers often overly focused on trying to obtain an outcome, while missing the optimal process to get to an outcome. Many positive outcomes are best produced by private initiatives, and by experimentation. It may be called a form of wisdom of the market: markets may make fewer mistakes or may retry quicker (and may limit negative consequences with their shorter feedback mechanisms) after a mistake than planners.¹⁸⁵ Governments may be less optimized for experimentation, as their feedback mechanisms can be too slow.

One of the private initiatives may also be the creation of industry communities or platforms to enhance trust, as digital systems have made it easier to bond together. Those platforms also often engage in private rule creation. This form of self-governance may then present some form of regulatory competition with government-produced rules.¹⁸⁶ Potentially, such private rulesetters may even compete among themselves. Governments may want to recognize or even sub-delegate towards such private producers of rules. A modern role of governments can be to empower private institutions that have greater efficacy and adaptability than governments.¹⁸⁷ Nonetheless, regulatory competition has not taken off spectacularly in Europe, certainly not in the domain of state provided rules. An example can be used where legal competition exists: for instance on the level of the state to incorporate a corporation: it is still unpopular in Europe to incorporate in one state and to conduct business elsewhere, despite the legality and in contrast to the United States where many companies choose the corporate law regime of Delaware.¹⁸⁸

¹⁸⁵ Dr Katerina Sideri, *Law's Practical Wisdom: The Theory and Practice of Law Making in New Governance Structures in the European Union* (Ashgate Publishing 2013).

¹⁸⁶ Gerard Hertig and Joseph A McCahery, 'Company and Takeover Law Reforms in Europe: Misguided Harmonization Efforts or Regulatory Competition?' (2003) 4 *European Business Organization Law Review* 179.

¹⁸⁷ John Henry Clippinger and David Bollier, 'The Social Stack for New Social Contracts' (*idcubed.org*, 2012) <<https://idcubed.org/open-platform/socialstack/>> accessed 6 June 2013.

¹⁸⁸ Joseph A McCahery and Erik PM Vermeulen, 'Does the European Company Prevent the "Delaware Effect"?' (2005) 11 *European law journal* 785; William W Bratton, Joseph A McCahery and Erik PM Vermeulen, 'How Does Corporate Mobility Affect Lawmaking? A Comparative Analysis' (2009) 57 *American Journal of Comparative Law* 347.

Part 2: Searching and contracting for financial resources with large pools of counterparties, hindered by high regulatory thresholds to use or develop coordination mechanisms

1. Coordination over individualism: open capital calls, and standardized contracts to deal with large groups of opaque investors

To access financial resources, firms may rely on interpersonal networks to reach investors that are present in those networks. That mechanism may be enhanced through the referrals of agents in such network that thereby extend the search further down to their networks as well. Otherwise, open capital calls may be necessary to reach invisible investors. And the latter mechanism may better function through infrastructure that centralizes supply and potentially also demand. Such type of conductive infrastructure can be considered as a type I form of coordination, as introduced in the theoretical part. When a small number of investors are found to contract with, irrespective of which of the two search mechanisms used, the accumulation of transaction costs to come to individual investment terms may still fall within reasonable margins. But when a large number of investors are found to contract with, then the accumulation of individual transaction costs may be prohibitively costly and may rather force one to offer a reasonable and standard set of investment terms to overcome the costly coordination among a large group of investors. Such form of standardization can be considered as a type II form of coordination, as discussed in the theoretical chapter before.

This part will take the point of view of such situations where a large number of (potential) investors will be addressed. To search in a large pool of investors, open capital calls are often more cost effective than going through (extended) interpersonal networks. Besides the search and promotion mechanism of open calls, market infrastructure to centralize such open capital calls will thus also be discussed. This part will also discuss the situation of contracting with such large number of investors. Standard investment contracts are thus used to overcome the prohibitive cost of many individual arrangements. This contracting can even be done at the level of the infrastructure that already centralized the search. This can then be in an anonymous way if the identity of the investor will be of little relevance. However, infrastructure to facilitate open capital calls can also just solve searches, but with contracting that is then handled in a customized way and away from the market infrastructure. Similarly, investors that are found through interpersonal networks can also agree on standardized investment terms instead of customized investment terms. There is thus no one on one fit between open calls and anonymous mass contracting.

Part three will however look at investments that take place with a small number of investors and where customized contracts are suitable and where their aggregate transaction costs are still manageable due to the low number, and where coordination under the form of standardization is less necessary. However, this will conflict with lawmakers' product of standard terms that would protect investors who lacked individual negotiation and due diligence power: namely with the corporate legal form that was originally designed for settings where investors would be found via open calls. That standard set of reasonable right for equity holders solved a coordination problem and offered investors the confidence to invest in firms where they lack individualized negotiation power. But it is rather only suitable in when a firm contracts with a large group of investors (as the situation in this part).

This part will focus on three specific situations that are hindered by existing regulations. Firstly, open capital calls face regulations that have been designed to maintain trust in the market. Especially as many investors are addressed that would lack individual means to verify if they deal with liars or rather with genuine counterparties. Regulations then prevent breakdown and adverse selections (the market may otherwise become “a market for lemons”¹⁸⁹). Such regulations do however make it prohibitively costly for many firms to use open and public calls to solicit interest from investors in a crowd (where potential parties are opaque as long as they don’t manifest themselves). As a result, such firms are forced to fall back to social networks around them to promote their investment opportunity (potentially, intermediaries can be used to extend such network search, but this is equally costly). The use of this channel is then not on the basis of a free choice.

Secondly, conductive market infrastructure to centralize searches face regulations that assume intermediaries to access that infrastructure. This setup was for a long time the setup of exchanges, and it is heavily entrenched in regulations. This creates a substantial level of path dependency. This setup of exchanges was perfect when all investment activity was concentrated around a small number of very large firms (and where the increasing returns around a small set of companies allowed complementary things like investment research). But it may represent an excessive threshold for the overwhelming amount of specialized technology-driven firms that we face today. Upcoming conductive infrastructure that wants to exploit the possibilities of the internet to create search infrastructure for open calls, faces however the limitations that inflexible regulation for the previous generation of market infrastructure brings. As those previous infrastructures had to be accessed through intermediaries, and as regulations assume this structure, disintermediated internet-based platforms therefore face obstructions.

This non-access to public markets – unless an intermediary is used (either to access centralized markets like stock exchanges or to access extended social networks around a broker), only adds to the difficulties that small technology driven companies already face. Namely that the uncertainty under which they operate renders them absolutely uncompetitive to invest in. The financial crises and the reduced availability of venture capital certainly created a bigger need to address potential sources of capital that are not readily identifiable, or sources that also do not want to be readily identifiable (to prevent too many unsolicited proposals). Finding such invisible potential investors can be prohibitively costly if they are not already part of an existing social network or extended social network. The same is true for investors that prefer to stay invisible, to avoid being inundated by requests, but who may as a result also be cut off from deal flow that does not enter the social network around them (or the community around them as they may be part of a community like a business angel network). The importance of open and public markets to finance high tech and high growth companies was until recently only granted attention as a backdoor. It was considered as an important secondary markets to generate a positive feedback that would make early stage investing more interesting¹⁹⁰, but it was not considered important as a primary

¹⁸⁹ Akerlof (n 35).

¹⁹⁰ See for instance BS Black and RJ Gilson, ‘Does Venture Capital Require an Active Stock Market?’ (1999) 11 *Journal of Applied Corporate Finance* 36.

channel to raise funds. However, public markets should certainly not be considered as being solely important as an exit mechanism for venture capital funds.

Finally, I will discuss the high cost of fragmentation that a number of additional processing mechanisms bring. Such mechanisms are for instance insurance or central counterparty mechanisms to increase trust between anonymous contract parties. But I will specifically focus on post-trade infrastructure for clearing and settlement. Just like the search infrastructure itself (namely the exchanges), those complementing infrastructures also require(d) intermediaries to access and use them. They are prohibitively costly to access them directly, and even for intermediaries is it prohibitively costly to access multiple ones directly. As a result, fragmentation between such infrastructures is substantial, especially in Europe. Law- and policymakers are trying to force a form of standardization and coordination between those infrastructures (a form of type II coordination, as discussed in the previous theoretical part), but this coordination effort does not tackle the high threshold that such infrastructure represents for small firms. That will thus also be discussed in this part.

2. Historic co-developments of securities regulations and intermediated market infrastructure

2.1. Emergence of open capital calls and their regulations

Pooling resources can be necessary to undertake activities that are too substantial to be carried by a single person, or where economies of scale make it more interesting to pool resources. Simple forms were embedded in a social network and resulted in partnerships between merchants to join forces for a joint undertaking. They work best when they involve partners with similar talents and who make similar contributions.¹⁹¹ Such multi-ownership structures were and are typically organized in an egalitarian way.

Later evolutions would also include partners who purely had a financing role but whose personal capabilities or identity are otherwise of no interest (to the partnership or to those who deal with the partnership). Ship journeys with outside investors, initially on a project-per-project basis, were for instance particularly popular in Holland in the 15th and 16 centuries.¹⁹² Such projects would obtain monopolies for trade with certain cities and remote places, which increased their scale but also their capital requirements. Once such capital-intensive economic activities would emerge, like maritime activities, structures would emerge that were less based on customized contracting with the partners involved (including financiers) but that could keep capital contributors at a

¹⁹¹ David Ernst and Joel Bleeke, 'Is Your Strategic Alliance Really a Sale?' (1995) 73 Harvard Business Review 97.

¹⁹² JC Riemersma, 'Trading and Shipping Associations in 16th Century Holland' (1952) 65 Tijdschrift voor geschiedenis 330.

more impersonal arm's length distance. In France, such structure was for instance the *société en commandite simple*.¹⁹³

Financial resources were not always available in the ship voyager's network. Through the public sale of shares, the expenses could be spread across a relatively large number of people. The need to use open calls to reach the necessary scale would also increase. Shipping monopolies would even become stricter, and the scale of the trade undertakings would therefore even increase more. Initially, different ships could import the same type of spice, each operating under its own and distinct monopoly (per destination), but once they were put in the market in Holland, they all competed in the same market. Therefore, in Holland, Johan van Oldenbarnevelt and prince Maurits forced to bundle all forces of the different Dutch cities, under the form of one (multiproject - or multi ship journey) undertaking that would be granted a monopoly of 21 years on the trade with India, from 1602 onwards.¹⁹⁴ That undertaking was the Dutch East India Company. The structure was a corporate body that outlived the lives or the substitutions of the members. Especially for an undertaking that could undertake multiple projects (instead of one single ship voyage, for instance), would this be a useful mechanism. Also, standardized shares in such corporate body could be efficiently sold to a wide base of investor via open calls.¹⁹⁵ The cost of individual investment negotiations would have been prohibitive.

Similar development would also simultaneously take place in other merchant nations¹⁹⁶, like England, which chartered the Company of Merchant Adventurers.¹⁹⁷ Or also the example of Russia can be given, with the formation of the Muscovy Company to conduct ongoing trade between Moscow and London.¹⁹⁸ Also the exploration and exploitation of new territories could be financed that way. The same was true for wars. It was for instance not unusual that money would be raised for war reasons: in 1789 for instance, bonds started to trade in New York to finance the war against England.¹⁹⁹ The colonization would require the financing of activities, which required a long blockage of funds, instead of repayment after every single completion of a project.

¹⁹³ For the history in France, see for instance: Charles Eldon Freedeman, *Joint-Stock Enterprise in France, 1807-1867: From Privileged Company to Modern Corporation* (University of North Carolina Press 1979).

¹⁹⁴ Oscar Gelderblom, Abe de Jong and Joost Jonker, 'The Formative Years of the Modern Corporation: The Dutch East India Company VOC, 1602-1623' (2013) 73 *The Journal of Economic History* 1050.; Giuseppe Dari-Mattiacci and others, 'The Emergence of the Corporate Form' [2013] Amsterdam Law School Research Paper.

¹⁹⁵ Jeffrey Stephen Robertson, 'Capitalism and Accounting in the Dutch East-India Company 1602-1623: An Historical Study of Determining Influences and Practices' (University of Wollongong 2011) <<http://ro.uow.edu.au/theses/3329>> accessed 12 December 2013.

¹⁹⁶ See for instance: KN Chaudhuri, *The English East India Company: The Study of an Early Joint-Stock Company 1600-1640* (Taylor & Francis 1999); Philip Lawson, *The East India Company: A History* (Routledge 2014); Douglas A Irwin, 'Mercantilism as Strategic Trade Policy: The Anglo-Dutch Rivalry for the East India Trade' (1999) 99 *Journal of Political Economy* 1296.

¹⁹⁷ John P Davis, *Corporations: A Study of the Origin and Development of Great Business Combinations and of Their Relation to the Authority of the State* (Beard Books 2000).

¹⁹⁸ Frederic Jesup Stimson, *Popular Law-Making: A Study of the Origin, History, and Present Tendencies of Law-Making by Statute* (The Lawbook Exchange 1910).

¹⁹⁹ Jerry W Markham, *A Financial History of the United States: From Christopher Columbus to the Robber Barons (1492-1900)* (ME Sharpe 2002).

From some point of view, the corporate laws and their standard equity can be considered as instruments to solve a coordination problem.²⁰⁰ By offering limited liability to a manager, one gives the incentive to lead an initiative to find investors, and by giving those investors a standard set of fair deal terms they will be happy to enter into in a non-negotiated way. This encourages open calls and consequent contracting that does not require further negotiation. It drastically reduces the individual transaction cost.

However, in settings without such possibility for due diligence and individual negotiation, there could be a source of market breakdown, even if standard equity provided a number of protections like voting rights. The opportunity to lie during a fundraising, as a result of information asymmetries, produced some problematic situations. The war financings happened for instance often in a hidden way. But worse than that, a lack of control over the use of the raised funds allowed an easy route to self-dealing for the managers, or it created an incentive for miscommunicating. The Mississippi Company with John Law was an example: it was the first record of corporation to overvalue its assets to lure investors to invest at overly high equity valuations.²⁰¹

Britain on the other hand was confronted with the South Sea Bubble affair. The South Sea Company was just like the Dutch East Indian Company a company that was granted an existence and monopoly, by way of Crown charter (in this case, it was formed in 1711).²⁰² Its main purpose was the placement of English government debt with the public. To be able to guarantee its income, it was given a monopoly for trade in the South Seas.²⁰³ The stock of the company became however subject to panic sales, after share purchases were made on margin, and sometimes on speculative grounds.

These early problems were caused by information asymmetry they could lead to market breakdown if investors lacked suitable means to know about the true state of the company. Indeed, when the crowd was addressed, individual investors would not have the possibility or power to undertake individual due diligence.

To prevent a market breakdown when many anonymous investors would be addressed, governments stepped in to increase the information flows towards anonymous crowds and to guarantee the availability of reasonable protection rules and mechanisms in the structure where they would ultimately buy in. The Bubble Act was an early example and that act made it more difficult for investors to sell the stock unless a suitable amount of information was provided.²⁰⁴ This restriction would survive up until the

²⁰⁰ Richard N Langlois and Paul L Robertson, 'Business Organization as a Coordination Problem: Toward a Dynamic Theory of the Boundaries of the Firm' (1993) 22 *Business and Economic History* 31.

²⁰¹ B Mark Smith, *A History of the Global Stock Market: From Ancient Rome to Silicon Valley* (University of Chicago Press 2004).

²⁰² John Carswell, *The South Sea Bubble* (Stanford University Press 1961).

²⁰³ Mark R Gillen, *Securities Regulation in Canada* (Thomson Carswell 2007).

²⁰⁴ Margaret Patterson and David Reiffen, 'The Effect of the Bubble Act on the Market for Joint Stock Shares' (1990) 50 *The Journal of Economic History* 163; Richard Dale, *The First Crash: Lessons from the South Sea Bubble* (Princeton University Press 2004).

drafting of the Companies Act of 1844 and later editions. For instance, the Companies Act of 1867 sets the information that a prospectus had to contain, if a prospectus was issued. A 1908 amendment even included prospectus-like documentation, if the promoters would seek to promote the sale outside the cases where a prospectus is needed, as it now required at least “a statement in lieu of prospectus” containing much of the same information.²⁰⁵

Especially when corporations would not be a state monopoly anymore, but when it would be possible to apply to form a corporation, states would prevent the market breakdown that could otherwise emerge from their usage. With the industrialization, the demand for such corporation with limited liability would even grow more, as the need to pool and concentrate monetary resources also substantially grew. The need to obtain a specific governmental charter was therefore abandoned, in 1867 in France.²⁰⁶ And from 1844 onwards, the creation of corporates happened through registration in the UK.²⁰⁷ The switch from monopoly to privilege to simple registration spread throughout continental Europe and the United States.

At the end of the 19th century, it was also Germany that was a first mover in respect to securities regulations.²⁰⁸ Reforms in Germany as early as 1884 and 1896 already tightened up the securities regulations, certainly in relation to open capital calls.²⁰⁹ However, it should be noted that this emergence of German regulations was not accidental. Just like any other emergence of reactive regulations, it followed after a crash: namely the 1873 stock market crash. A large number of companies were delisted from the German stock exchanges then, and a new stock corporation law was introduced in 1884, which would also include many pre-investment provisions, especially affecting IPOs.²¹⁰ For instance, the law demanded public filing of independently audited balance sheets and profit and loss statements from the two years preceding incorporation. It would also be necessary to continue to file publicly a balance and a profit and loss statement on an annual basis (both to accommodate potential investors, but also to lower the agency problem towards existing investors, as will be discussed in the second part of this thesis).²¹¹ Besides the going public provisions in the companies act, the German Exchange Act of 1896 even tightened the regulation further.²¹² Despite the existence of weaker requirements before that act, it was described as “the most elaborate attempt ever made to regulate speculative

²⁰⁵ Carsten Burhop, David Chambers and Brian R Cheffins, ‘Regulating IPOs: Evidence from Going Public in London and Berlin, 1900-1913’ [2011] ECGI - Law Working Paper.

²⁰⁶ Freedeman (n 193).

²⁰⁷ Josephine Maltby, ‘UK Joint Stock Companies Legislation 1844-1900: Accounting Publicity and “Mercantile Caution”’ (1998) 3 Accounting History 9.

²⁰⁸ Burhop, Chambers and Cheffins (n 205).

²⁰⁹ Rainer Gömmel, ‘Entstehung Und Entwicklung Der Effektenbörse Im 19. Jahrhundert Bis 1914’ [1992] Deutsche Börsengeschichte 135; Burhop, Chambers and Cheffins (n 205).

²¹⁰ Markus Baltzer, *Der Berliner Kapitalmarkt nach der Reichsgründung 1871: Gründerzeit, internationale Finanzmarktintegration und der Einfluss der Makroökonomie* (LIT Verlag Münster 2007); Burhop, Chambers and Cheffins (n 205).

²¹¹ Julian Franks, Colin Mayer and Hannes F Wagner, ‘The Origins of the German Corporation – Finance, Ownership and Control’ (2006) 10 Review of Finance 537.

²¹² Henry Crosby Emery, ‘The Results of the German Exchange Act of 1896’ (1898) 13 Political Science Quarterly 286.

markets”²¹³, or as “a corporate code that provided more extensive corporate governance than existed in virtually any other country at the time”.²¹⁴

The German Stock Exchange Act took over the principle that emerged two decennia earlier in Britain (through the Companies Act), where every company applying for listing would have to issue a prospectus. The formal structure of such prospectus was considerably described by the German parliament²¹⁵, and it included aspects like the use of the capital to be raised, recent financial performance (balance sheet and most recent profit and loss statement), dividends paid (if any during the five year preceding the IPO). Such prospectus had to be presented to the admission board of the stock exchange on which the stock would be listed (there were no national securities regulators like today). Such admission board had to ensure that all statements were as complete as possible and it had to refuse a listing if the requirements were not met or if the public would be defrauded.²¹⁶ Even if a company would use a pecking order, in which it would try an admission board after it already tried (but failed) to obtain an admission from another admission board at another stock exchange, then it required the consent of the latter admission board to list (in the event the former admission board would accept the prospectus).²¹⁷ Also, issuers had no other choice for their primary offerings that involved public communications, than using a stock exchange, as the 1886 law prohibited any information about stocks that were not officially admitted to a German stock exchange. Nonetheless, those 1884 and 1886 laws introduced the principle that the regulations generally apply irrespective if an offering takes place through an exchange or not. The element of public offering is the more important element to decide about their scope.

But despite the mass investor participation for ship voyages and war undertakings, Europeans would however gradually become less interested to finance industrial activities. But this is unlike the situation in the United States, where open capital calls for some industrial activities and the economic expansion would spark the imagination of the public. The new world had already learned from the experience of forming joint stock companies and from the director liability system in England. Some requirements for issuers already emerged as early as 1852 under the form of the registration of railroad securities in Massachusetts.²¹⁸ However, American states only seriously developed their own securities legislation in the late 1800's and early 1900's to prevent unscrupulous behavior by service providers and entrepreneurs, starting with Kansas. The Kansas Act, and the statutes that were inspired by it, introduced the system of “merit review”. Merit review implies a test that any company wishing to offer securities, must be an organization whose plan of business, or contracts didn't include any

²¹³ Ibid.

²¹⁴ Franks, Mayer and Wagner (n 211).

²¹⁵ Emery (n 212).

²¹⁶ Sibylle H Lehmann, ‘Taking Firms to the Stock Market: IPOs and the Importance of Large Banks in Imperial Germany, 1896–1913’ (2014) 67 *The Economic History Review* 92.

²¹⁷ Ernst Loeb, ‘The German Exchange Act of 1896’ (1897) 11 *The Quarterly Journal of Economics* 388.

²¹⁸ Gerald D Nash, ‘Government and Business: A Case Study of State Regulation of Corporate Securities, 1850–1933’ (1964) 38 *Business History Review* 144.

provisions that were "unfair, unjust, inequitable or oppressive," or that the investment did "promise a fair return."²¹⁹

Simultaneously with those so-called state "Blue Sky" laws, the New York Stock Exchange's Committee on Stock List began demanding and obtaining IPO disclosure agreements from most firms in the early 1910s.²²⁰

Since these early days, it has become universal practice to have securities laws that require a prospectus to be issued before securities can be sold.²²¹ It also became a universal practice that company would contain provisions that also impact the trust in the pre-investment phase – including ex-post guarantees like director liabilities, etc. Another set of ex-post mechanism would also try to reduce the information asymmetries on an ongoing basis. For instance, the United Kingdom would also draft some disclosure regulations for public offerings after 1910, and the rules of the London Stock Exchange would also stipulate that a company seeking a quotation had to have articles of association in a form that the Committee of the Stock Exchange approved (the precise requirements were only created in 1909, with one rule being the annual circulation of the company's profit and loss account to the shareholders and the Stock Exchange²²², and with another rule being that a company had to file its prospectus²²³). For non-listed companies, it would take until 1948 before companies were required to file balances and profit and loss statements publicly on an annual basis.²²⁴ And it would even take until 1986 before the UK would have legislation that was fully equivalent to the continental counterparts, in terms of liability for sanctions against misdisclosure. In the UK legislation did not provide for fully equivalent liability for misdisclosure by those responsible for a prospectus until 1986.

But as the emergence of securities law were often sparked by shocks, it should not surprise that the next source of regulations for open calls would rather be the United States. There, railroad activities were an activity that drew a lot of attention from the public to invest. Besides booming economic activities, also complementary services would emerge that would increase the mass investment activity even more. Infrastructure like exchanges will be discussed in a next title. But there would also be things like investment banks, the ticker technology (which only distributed pricing information), and other innovations that would help to attract the attention of the general public in the stock markets. For instance the creation of a specialized media, The Wall Street Journal in July 1889²²⁵, would bring order in the chaos and would potentially make investing more accessible to a wide public that went beyond a closed

²¹⁹ Louis Loss and Joel Seligman, *Fundamentals of Securities Regulation* (Aspen 2004).

²²⁰ John C Hilke, 'Early Mandatory Disclosure Regulations' (1986) 6 *International Review of Law and Economics* 229.

²²¹ Rafael La Porta, Florencio Lopez-De-Silanes and Andrei Shleifer, 'What Works in Securities Laws?' (2006) 61 *The Journal of Finance* 1.

²²² Brian R Cheffins, *Corporate Ownership and Control: British Business Transformed* (Reprint edition, Oxford University Press 2010).

²²³ Sir Francis Gore-Browne and William Jordan, *Handbook on the Formation, Management and Winding Up of Joint Stock Companies* (Jordan 1908).

²²⁴ Cheffins (n 222).

²²⁵ Peter L Bernstein, *Capital Ideas: The Improbable Origins of Modern Wall Street* (Simon and Schuster 1993).

circle of identifiable investors. Merrill Lynch made a number of innovations to increase the number of ordinary investors and also to increase profits from commissions from trades from these ordinary investors.²²⁶ JP Morgan was the son of a banker with a passion for corporate mergers, who specifically started to exploit these economies of scope in the railroad business and consequently started to pool ever-larger amounts of money. Merging multiple smaller railroad companies also allowed charging higher prices once a specific rail link could be operated as a monopoly. In 1901, US Steel was the first billion-dollar corporation.²²⁷ Because the value and price went up so spectacularly, it attracted the attention of more and more investors. This economic expansion even continued for a long time. For instance, post-war America of the 1920's was a very prosperous time. Americans had money to spend: citizens had for instance money to buy radios. And in parallel, they also bought shares of the companies that produced such radios.²²⁸ The same happened with car manufacturer stocks. Stock prices went through the roof, and this attracted even more interest.

In continental Europe, companies are and were mainly financed by banks, through repayable loans. This is in contrast to the equity culture that thus emerged in the Anglo-Saxon economy. Obviously, this also immunized European households from shocks in the economy, as their savings were not tied up in equity holdings. Instead, risks were concentrated with banks.²²⁹ Those are professional risk managers (i.e. with expertise to calculate risk-adjusted interest rates when offering loans, with a diverse portfolio that allowed to spread the risk that some would fail to repay, etc.). Besides the fact that there were no real events that sparked the imagination of the public to participate in the financing of companies in Europe, there was also no real effort from governments to encourage that. Maintaining that status quo, and thus maintaining the limited marketing channels where firms could reach the public, can be considered as a policy choice instead of a lawmaking effort to improve the market quality or to combat market failures. It frames within the compromise that European nations took to create social welfare states and to protect citizens from the most extreme consequences of capitalism.²³⁰ And in many cases, an attitude in favor of bank financing was also in favor of national banks, especially in an era with little international competition.

The involvement of the public in the United States posed a serious problem during a downturn in the 1920s. Especially since a lot of stocks were bought with margin accounts (where investors actually borrow the money to buy stocks), and this triggered a lot of margin calls and subsequent sales. This resulted in an imbalance between

²²⁶ Janice Traflet, "Own Your Share of American Business": Public Relations at the NYSE during the Cold War' (2003) 1 *Business and Economic History On-Line* 1.

²²⁷ Alexander Tabarrok, 'The Separation of Commercial and Investment Banking: The Morgans vs. The Rockefellers' (1998) 1 *The Quarterly Journal of Austrian Economics* 1.

²²⁸ Marty Gitlin, *The 1929 Stock Market Crash* (ABDO 2008).

²²⁹ Martin Hellwig, 'Banks, Markets, and the Allocation of Risks in an Economy' (1998) 154 *Journal of Institutional and theoretical Economics* 346; Ross Levine, 'Bank-Based or Market-Based Financial Systems: Which Is Better?' (2002) 11 *Journal of Financial Intermediation* 398.

²³⁰ Joseph E Stiglitz, *The Role of the State in Financial Markets* (Institute of Economics, Academia Sinica 1993).

buying and selling orders that triggered even more margin calls and sales.²³¹ A crash followed. And since the public at large was also involved and hurt, people stopped to spend money in normal life as well. This time, not only was the price of stocks affected (a fact that had no influence on the revenues of a company as such), now it also resulted in a real economic downturn, with revenues of companies sharply declining and resulting in bankruptcies and very high unemployment rates.²³² This only increased the willingness to enact stronger securities regulations.

Thus, instability and public madness were the main triggers of a crash, rather than companies that lured investors into fraudulent investments. Stock prices are very subject to the behavior of the masses of investors, and swings in perception. Franklin Roosevelt 's main objectives were to prevent instability and information failures. This was expressed in a cornerstone law: the federal Securities Act of 1933.²³³ Brokers would have to act responsibly and had to treat their customers' money as if it was their own, but corporations now also had to register and file accounts when they wanted to raise money from the public. This helped the investment public in two ways: first, the registration statements were public, and second, prospective investors would be presented a prospectus based on the information in the registration statement.²³⁴ Also, the Securities and Exchange Commission (SEC) was created, to effectively treat registrations with a decent level of specialization, knowledge and capabilities.²³⁵ The Securities Exchange Act of 1934 was later formed to manage secondary market trading through continued information, the prevention of fraudulent and manipulative trading and through overall regulation of the securities markets and persons that use such markets.²³⁶

Prospectuses would thus everywhere remain a cornerstone of financial promotion to the public. Not all companies had the time and the money to comply with the federal and state registration requirements that resulted. And in order not to violate the ability of honest businesses to raise capital in private offerings, a number of exemptions were included to still make this network-based promotion possible besides the now heavily regulated open calls. In Section 5 of the 1933 Act, exceptions were included from the registration requirement. In Section 4(2) of the 1933 Act, exceptions for non-public or private offerings of securities were included. The investors that could be reached that way were considered to have no practical need for the disclosures required in formal registration statements.²³⁷ The Supreme Court case, in *SEC v. Ralston Purina*, sought to provide the scope of the latter exemption. It judged that the scope of the exemption must depend on whether the investors need protection:

²³¹ Mark Mobius, *Equities: An Introduction to the Core Concepts* (John Wiley & Sons 2007); Barrie A Wigmore, *The Crash and Its Aftermath: A History of Securities Markets in the United States, 1929-1933* (Greenwood Publishing Group 1985).

²³² Bruno Dallago, Chiara Guglielmetti and Michele Rondinelli, *The Consequences of the International Crisis for European SMEs: Vulnerability and Resilience* (Routledge 2012).

²³³ Erik F Gerding, *Bubbles, Law and Financial Regulation* (Routledge 2013).

²³⁴ Jerry W Markham, *A Financial History of Modern U.S. Corporate Scandals: From Enron to Reform* (ME Sharpe 2006).

²³⁵ Ibid.

²³⁶ Ibid.

²³⁷ James M Bartos, *United States Securities Law: A Practical Guide* (Kluwer Law International 2006).

“an offering to those who are shown to be able to fend for themselves is a transaction not involving any public offering.”, and, “the focus of the inquiry should be on the need of the offerees for the protection afforded by registration,”, and those offerees “must have access to the kind of information which registration would disclose.”²³⁸

This pushed firms that could not meet the prohibitively prospectus costs towards non-public marketing channels: namely to promotion within interpersonal networks or towards the few investors that are publicly visible (i.e. venture capital funds). The growing availability of agents like venture capital funds or specialized investment banks and private placement agents did make this forced use of an alternative marketing channel at first sight acceptable. But in case of venture capital funds, such funds expect high growth and rapid exit. Indeed, towards investors, a limited investment lifetime is promised, but the actual invested instruments (equity) do not have a specific maturity date. And due to the limited availability of venture capital in Europe, many companies compete but only few receive funding, while the rest may have excellent business credentials but they will not get the funding. Therefore, despite the appropriateness and fitness of venture capital for funding innovative firms, the funding gap is still enormous.²³⁹ Therefore, it is certainly worthy to consider how variations like open calls can still play a lost role. Also, within such framework where retail investors would be largely shielded off from equity investing, it would become a privilege for individual retail investors to get to know about available deals.²⁴⁰ This often required being a member of a private investment “club” like a business angel club, to have the honor to be “invited” to participate in a venture capital fund and to have obtained substantial information rights to obtain insight in dealflow too, or to market themselves as high net worth investors. In contrast, the public marketplace offers open access to all investors, but the regulations that will later be discussed might perhaps require some adaption to reestablish this open access.

However, by the time that the 1933 securities regulations system came in place, individual states had already created their own Blue Sky laws (like the example of Kansas, as described before). With this situation in mind, the 1933 Act respected a dual regulation system. For instance, the merit review system of the states was left untouched, but also other state regulations were expressly preserved. Also, exemptions from federal securities regulations (contained in today’s Regulation D and which includes the famous Rule 506) required coordinated rules at the state level. The reservation of state jurisdiction in Section 18 of the Securities Act was broad and unequivocal:

²³⁸ Loss and Seligman (n 219).

²³⁹ Janke Dittmer, Joseph A McCahery and Erik PM Vermeulen, “The “New” Venture Capital Cycle and the Role of Governments: The Emergence of Collaborative Funding Models and Platforms’ [2013] Tilburg Law School Research Paper.

²⁴⁰ Yael V Hochberg, Alexander Ljungqvist and Yang Lu, ‘Whom You Know Matters: Venture Capital Networks and Investment Performance’ (2007) 62 *The Journal of Finance* 251; Roger Sørheim, ‘The Pre-Investment Behaviour of Business Angels: A Social Capital Approach’ (2003) 5 *Venture Capital* 337.

“Nothing in this Subchapter shall affect the jurisdiction of the securities commission (or any agency or office performing like functions) of any state or territory of the United States, or the District of Columbia, over any security or any person.”²⁴¹

And efforts to bring uniformity in the state specific securities regulations around the same time, didn't have much success. Such efforts took place as early as 1929, with the adoption of the first Uniform Securities Act, but it never became popular.²⁴²

Thereafter, it would really take until after World War II, until many countries would more seriously tighten securities regulations.²⁴³ But the round of securities regulations in the United States, which was already inspired by Germany and the United Kingdom, would also inspire other countries. Up until today, the entrenched structures in securities regulations can still be rooted back to that moment. Minor adjustments and additions since then are for instance the Sarbanes-Oxley Act following the dot-com bust, and then the Dodd-Frank Act following the financial crisis of 2007-08.²⁴⁴

The fact that Germany, the United Kingdom, and the United States regulations would become the main driver or example for regulations in other countries, can be illustrated with Japan. Japan was requested to implement US-inspired legislation by the occupation authorities after World War II, as a condition before the Japanese securities markets could be reopened. Korea would thereafter follow the Japanese (thus, US) model, etc.²⁴⁵

Also, the 1929 Companies Act from the United Kingdom, who served as a source of inspiration for the securities regulation in the United States in the 30s, and who had the same principles, spread mainly through the colonial influence of the United Kingdom.²⁴⁶

Those regulations would also serve as an example for the European harmonization efforts for securities regulations. Contrary to the US, ordinary citizens were not heavily investing in stocks in Europe, and were therefore relatively immune from crises in stock prices. Nonetheless, the other problems that the 1933 US securities regulation system tried to tackle could also potentially cause harm in other countries, and it would not take long before Europe also started to tighten securities regulations, by using the same principles.

The situation in Europe was recognized by a regulatory framework on the level of individual countries (like on the level of the states in the United States). While the Great Depression led to a coordinated rulemaking effort that also included federal

²⁴¹ Roberta S Karmel, 'Blue-Sky Merit Regulation: Benefit to Investors or Burden on Commerce' (1987) 53 Brooklyn Law Review 105.

²⁴² Aaron M Tidman, 'Securities Law Enforcement in the Twenty-First Century: Why States Are Better Equipped Than the Securities and Exchange Commission to Enforce Securities Law' (2006) 57 Syracuse Law Review 379.

²⁴³ Raghuram G Rajan and Luigi Zingales, 'The Great Reversals: The Politics of Financial Development in the Twentieth Century' (2003) 69 Journal of Financial Economics 5.

²⁴⁴ Laureen Snider, 'The Conundrum of Financial Regulation: Origins, Controversies, and Prospects' (2011) 7 Annual Review of Law and Social Science 121; McDonnell (n 180).

²⁴⁵ Kye Sung Chung, 'The Internationalization of the Korean Securities Market: Legal and Economic Perspectives' (1988) 27 Columbia Journal of Transnational Law 27.

²⁴⁶ Philip R Wood, *Regulation of International Finance: V. 7* (Sweet & Maxwell 2007).

regulations, it would take very long before a similar process would emerge in Europe. But the system would certainly also follow a harmonization direction, instead of creating a market for regulation where different countries would be able to compete for more attractive regulatory frameworks (country-specific differences existed, but they were of little or no use in a cross border setting as one had to comply with the local rules for every cross-border activity). Also, the harmonization effort would not take the form of a reactive rulemaking effort in Europe, as there was no event of crisis that triggered the supranational rulemaking process. Instead, European supra-national efforts took the form of proactive rulemaking.

As enterprise growth and job creation was compromised, and savings were not optimally allocated or efficiently used, there was a desire for more deep and liquid markets. It would take until 1966 before the Ségre Report would identify two issues in the European securities, which were also attributed to the unharmonized market:²⁴⁷

- ⇒ Businesses suffer from a lack of capital opportunities in the public fund-raising sphere.
- ⇒ The investing public is not able to find attractive opportunities on the market.

Early harmonization efforts in Europe were for instance the Admissions Directive, the Listing Particulars Directive of 1980 and the Interims Report Directive, which harmonized aspects of the listing process for issuers, although it would take until the Lisbon treaty of 1992 before a true coordination process through supra-national securities regulations would be started. This happened under the name “the Lamfalussy process”. The Lamfalussy process stems from the Lamfalussy committee, which was a group of experts that were set together at the request of Ecofin Ministers in 2000. The process was an approach of harmonization within the boundaries of the treaties (thus without requiring treaty changes).²⁴⁸ Ultimately, it led to the Lamfalussy report in 2001.²⁴⁹

The basic principle of this supra-national securities regulation framework would be a system of mutual recognition, based on a “single passport”, instead of a single rulebook. The 1980 listing particulars directive was therefore amended in 1987 to introduce mutual recognition and in 1990, to introduce mutual recognition of public-offer prospectuses as stock exchange listing particulars.²⁵⁰ Also for issuers, the integration of the European financial markets resulted in 1989 in the Prospectus Directive (Council Directive 89/298/EEC, and therefore the Public Offers Directive). This allowed to have one prospectus (approved by a companies’ home state), and to use it without

²⁴⁷ Iris HY Chiu, *Regulatory Convergence in EU Securities Regulation* (Kluwer Law International 2008); Claudio Segre, ‘The Development of a European Capital Market. Report of a Group of Experts Appointed by the EEC Commission.’ (European Commission 1966) Working Document.

²⁴⁸ Boris Bartels and others, *European Banking and Financial Services Law* (Larcier 2013).

²⁴⁹ European Commission, ‘Final Report of the Committee of Wise Men on the Regulation of European Securities Markets’ (2001)

<http://ec.europa.eu/internal_market/securities/docs/lamfalussy/wisemen/final-report-wisemen_en.pdf> accessed 13 October 2013.

²⁵⁰ J William Hicks, ‘Harmonization of Disclosure Standards for Cross-Border Share Offerings: Approaching an International Passport to Capital Markets’ (2001) 9 *Indiana Journal of Global Legal Studies* 361.

restrictions for promotion of the offering in other European member states.²⁵¹ In general, European Commission officials are inclined towards shifting regulatory authority to the European level, or so-called integration, as problems are almost always attributed to fragmented national economies.²⁵²

After the start of the harmonization effort, such rules would gradually also affect brokerage services, exchanges, sellers & issuers, custodians, etc. These activities are described hereafter. There, a similar hub and spoke model is in place with regulation in the home state, and a passport to conduct services under a harmonized regime in a guest state. Therefore, instead of merely working with a single passport, European rulemakers would also strive towards a single harmonized rulebook for securities service providers. For instance, the Directive on Markets in Financial Instruments (MiFID) and the Regulation on Markets in Financial Instruments (MiFIR) helps to develop a single rulebook in Europe.²⁵³ This was recommended by the Larosière group and it was also supported by the conclusions of the ECOFIN Council in June 2009.²⁵⁴

2.2. Emergence of intermediaries and mutualized institutions

Due the way the concept of equity in corporations was designed (and standardized) was it only a natural move that central infrastructure would be a useful addition in the market, especially for secondary trading. Equity's nature is one of an ownership piece with a residual payoff property with a continuous existence of that claim. The worth of it is first of all inherently unstable (due to market risks that affect the operations of the company, and thus also the residual payoff, but also due to possible opportunistic behavior of the management), and an immediate value can only be extracted from a security with such properties if it can be sold to a party that will pay a value for it that roughly equals the discounted future potential payoffs – and which therefore takes the time value of the future payoffs into account, as well as the associated risks.

The tradable units in early corporations would also be traded at the places where the goods of the ship voyages would be traded (i.e. were slaves would be traded). Merchants used for instance specific meeting places to trade in foreign currencies and in bills of exchange: they already held regular meetings in Northern Italy (Florence, Genoa and Venice) in the 13th and 14th century, in order to conclude transactions

²⁵¹ Manning G Warren, 'The Common Market Prospectus' (1989) 26 Common Market Law Review 687.

²⁵² Wayne Sandholtz, *High-Tech Europe: The Politics of International Cooperation* (University of California Press 1992).

²⁵³ See Explanatory Memorandum to MiFID, p. 4 and Explanatory Memorandum to MiFIR p. 2

²⁵⁴ European Commission, 'Report of the de Larosière Group' (2009) <http://ec.europa.eu/internal_market/finances/docs/de_larosiere_report_en.pdf> accessed 22 October 2013; European Commission, 'Council Conclusions on Strengthening EU Financial Supervision' (2009) <http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressdata/en/ecofin/110617.pdf> accessed 22 October 2013.

between each other.²⁵⁵ Such meetings would later also emerge in other European cities. In Bruges for instance, they took place in the house of the *van den Beurse* family, a merchant family. And in Amsterdam, they took initially place in a street with the name *Damrack*.²⁵⁶ However, because the legal innovation of tradable stocks had already been introduced in The Netherlands, thanks to the Dutch East India Company (see above), also stocks were traded in Amsterdam. In the United States, trading took place in the street “Wall Street”. Wall Street, which once had a wall to hold Indians out of the civilized colony, continued to be a meetingplace after the removal of the wall: it was a place where slaves were traded, where merchants met, where the pillars for public humiliation were located, and also the place where George Washington was sworn in as the first US president.²⁵⁷ Also people wanting to enter into trades in stocks met there, in open air. Just like the Dutch East India Company justified having a meeting place to exchange stock in The Netherlands, the expansion towards the West in America also justified having a meeting place to trade stocks in America.

Traders prefer to trade where other traders trade (called “liquidity externalities”²⁵⁸). According to an old market saying, “liquidity begets liquidity,” and, as a result, liquidity at a central venue tends to become larger.²⁵⁹ Central venues initially attracted people that acted for their own account and also people that offered a brokerage service and that performed trades for other (physically remote) persons. The open air trading venues in fact allowed everybody to take up the brokerage activity and to offer the service of searching for a counterparty for someone else’s shares, and to consequently join the open air marketplace. Some would also create a more organized procedure when multiple parties competed for a deal, for instance through price setting via auctions. Fees that could be collected from that provided the incentive to create infrastructure that could overcome a coordination failure. For instance, at 22 Wall Street, John Sutton would organize such auctions at noon every day.²⁶⁰

Stock exchanges would often emerge at those central meeting venues, under the form of mutualized institutions between intermediaries. Intermediaries already facilitated the search for investors. When using intermediaries, agency problems can exist and have been regulated since a very long time. As early as the thirteenth century (in 1285) King Edward decreed that brokers in London should be licensed, although it’s perhaps better to say that the Court of Aldermen issued licenses and that the court draw its licensing authority from one of Edward I’s statutes.²⁶¹ Another early example is Germany that

²⁵⁵ Meir Kohn, ‘Risk Instruments in the Medieval and Early Modern Economy’ <<http://papers.ssrn.com/abstract=151871>> accessed 22 May 2014.

²⁵⁶ Pieter Scheltema, *De Beurs van Amsterdam* (Portielje 1846).

²⁵⁷ Robert Sobel, *The Big Board: A History of the New York Stock Market* (Beard Books 2000).

²⁵⁸ See for instance: M Pagano and A Röell, ‘Transparency and Liquidity: A Comparison of Auction and Dealer Markets with Informed Trading’ (2012) 51 *The Journal of Finance* 579; B Chowdhry and V Nanda, ‘Multimarket Trading and Market Liquidity’ (1991) 4 *Review of Financial Studies* 483; AR Admanti and P Pfleiderer, ‘Sunshine Trading and Financial Market Equilibrium’ (1991) 4 *Review of Financial Studies* 443.

²⁵⁹ See for instance T Chordia, R Roll and A Subrahmanyam, ‘Market Liquidity and Trading Activity’ (2001) 56 *The Journal of Finance* 501.

²⁶⁰ Stuart Bruchey, *The Modernization of the American Stock Exchange 1971-1989* (Routledge 2013).

²⁶¹ Keith Marquis, ‘Responsive Securities Regulation an Assessment of the Enforcement Practices of the Ontario Securities Commission’

would impose heavy regulations for intermediaries: for instance, the German Stock Exchange Act of 1886 imposed that those who organized an IPO and underwrote it, were liable for false statements or suppression of facts, either purposely or through gross negligence.²⁶² In the new world would Kansas be one of the first states to regulate intermediaries, from 1911 onwards, due to malicious cases where fraudulent and speculative securities were sold to farmers: the Kansas Act established basic principles of ethical conduct.²⁶³

But besides agency problems, intermediaries could also very easily engage in rent-seeking and monopolistic behavior by creating barriers to access the centralized trading venue (that central venue offered positive network externalities), and by cutting off all other participants from direct access to the centralized trading infrastructure. This exclusion could also be intended to prevent entry from new intermediaries that would otherwise dilute the profit opportunities. The idea that everybody could take up the activity of becoming a broker or an auctioneer, or that everybody could free ride on the anchoring price that was revealed during auctions, was of course not very satisfactory for existing brokers. For instance, an auctioneer that is faced with too much competition from free riders (where he does not catch commission) will soon find himself short of enough trade and liquidity to be appealing to clients (too little competition to set prices, too few networking effects to find counterparties) and consequently to be profitable due to the resulting decline in transactions. Therefore, in the US, 24 brokers that worked on Wall Street (open air), formed a pact in 1792, to avoid new market entrants that took away business (and it also served to avoid government regulations): the buttonwoods agreement. It constituted an organization "The New York Stock and Exchange Board".²⁶⁴ And instead of open air, the trades would take place behind closed doors and at fixed fees and with two auctions per day. All sales were recorded in books. From that moment on, the trading in stocks of about 30 reputable companies was less public, and a buyer or seller in those stocks had to hire one of those 24 brokers, to be able to make the trade. The same would happen in Amsterdam in 1851.²⁶⁵ Although traders in Holland had already chosen to trade stocks in a special-purpose building, with the name *Amsterdamsche Effectenbeursch* before they actually started to create this barrier to entry (the *Amsterdamsche Effectenbeursch* was established in the 16th century, and in the 17th century, the first stocks were traded there). Expansion in trading activity, and the demands that this puts on the meetingplace for those brokers, justified the erection of specific buildings. In New York, this would be the New York Stock Exchange building.

However, on the street in America, brokers that were not part of that group of 24 continued to trade stocks in other companies. In the 1920s, the stockbrokers that continued to trade stocks outside the building, and for smaller companies, would agree to jointly create the American Stock Exchange (AMEX).²⁶⁶

<http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1532366> accessed 15 December 2013; Gillen (n 203).

²⁶² Burhop, Chambers and Cheffins (n 205).

²⁶³ Ibid.

²⁶⁴ Stuart Banner, 'The Origin of the New York Stock Exchange, 1791-1860' (1998) 27 *The Journal of Legal Studies* 113.

²⁶⁵ Scheltema (n 256).

²⁶⁶ Robert Sobel, *AMEX: A History of the American Stock Exchange* (Beard Books 2000).

Similar situations would take place in other countries as well. For instance, in London and Germany. For instance, at the beginning of the 20th century, Germany had 23 of these stock exchanges, but a majority of all publicly traded companies, representing more than 80% of overall market capitalization, were listed in Berlin.²⁶⁷ The need to have local and thus fragmented exchanges could be overcome in some countries by using technology: from 1867 onwards, the ticker heavily reduced the distance between end investors and the central exchanges in the United States.²⁶⁸ This device allowed printing the prices on paper rolls, remotely. But already in the early 19th century, the telegraph allowed to transmit the prices on which brokers agreed at an exchange, to other cities.²⁶⁹

Besides spontaneous creations of stock exchanges, as a mutual creation from brokers, there would of course also be other powers that initiated early exchanges: especially governments that wanted to stimulate the capital market due to the social welfare effects that an efficient allocation brings. This happened for instance by Napoleon Bonaparte, who created different exchanges throughout the empire. One such exchange was for instance the one from Brussels, in 1801.²⁷⁰ It is an early example of government-sponsored efforts to overcome coordination failures, if private parties do not find the incentive to overcome them themselves. Having national exchanges was however also a status symbol (which is reflected in the impressive buildings). Individual national governments in Europe would feel a need that their economy would need such an exchange as evidence of their market economy credentials, in case they didn't already have a group of professional traders/brokers that had grouped together to form a membership based exchange that would have the monopoly over the trade of public companies within that country. This national pride was also present during the transition process of Central and Eastern European countries, which also led to the creation of some national stock exchanges. This would lead to a largely inefficient and fragmented setting in Europe, with no Europe-wide exchanges like the New York Stock Exchange and the AMEX in the United States.

Centralized institutions offered increasing returns due to the positive network effects when buyers and sellers (or their intermediaries) flock to the same venue.²⁷¹ Channeling the access through intermediaries allowed those intermediaries to charge a monopoly rent to access this mutually owned infrastructure. That rent would not only apply to the access to trade. The monopoly position of exchanges (either a monopoly as the primary trading/listing venue for a stock, or a monopoly for the trading/listing of all stocks within a certain country or region) also comfortably allowed deriving income from price feeds to the outside world as well. Today, in a setting where exchanges have become for-profit institutions instead of mutualized institutions where the members would make the profits, these datafeeds are still one of the sources of income, besides

²⁶⁷ Burhop, Chambers and Cheffins (n 205).

²⁶⁸ Sobel, *The Big Board* (n 257).

²⁶⁹ Ranald Michie, *The London and New York Stock Exchanges 1850-1914* (Routledge 2011).

²⁷⁰ Robert A Schwartz and Reto Francioni, *Equity Markets in Action: The Fundamentals of Liquidity, Market Structure & Trading* (John Wiley & Sons 2004).

²⁷¹ Paul G Mahoney, 'The Exchange As Regulator' (1997) 83 Virginia Law Review 1453.

fees that arise after every transaction, listing fees and membership fees.²⁷² Price feeds are indeed still an extremely important source of income, even today in Europe where new trading venues arrive –which perform off-exchange trading. Brokers need to “buy” such price feeds in order to guarantee best execution. Also the “listing” notion would allow deriving monopoly rents. It implies that only stocks would be traded that would be “listed” (registered) on the exchange, and becoming listed would imply a listing fee. Most exchanges would only trade the stocks of the companies that have their official listing on the exchange (NYSE is an example of such an exchange). However, there are a small number of exchanges that also allow (or even organize) the trade of stocks that do not officially list on the exchange. For instance, in the US, there are many regional exchanges (i.e. Boston) where NYSE stocks can also be traded.²⁷³ It should however be noted, that this listing authority property is not necessarily an inherent property of exchanges, just like the clearing and settlement aspect, which is also not an inherent property (which will be described hereafter).

This type centralized market infrastructure was initially not influenced by regulation, also not for the monopolized access. And choosing not to access this system clearly represented a disadvantage (as one could not use the network effects of such centralized markets). Even worse, when initial regulations existed, they did exactly increase the monopoly position of central exchanges – instead of encouraging competition between those infrastructures. The German Stock Exchange Act of 1886 prohibited for instance the promotion of any public information about stocks that were not officially admitted to a German stock exchange.²⁷⁴ The German stock exchanges would thus have the absolute monopoly as a trading venue, and no over-the-counter trading venues would be able to exist. It is an early illustration of how regulations entrenched the market structure. There were of course also good reasons: if shares would be traded around this infrastructure, then they could free ride on the price discovery mechanism and they could take less commission – this fragmentation of trade would however take liquidity away and would harm networking effects that a centralized marketplace otherwise brings. Other European countries would in many cases even sharpen such rule in the decades thereafter, by imposing that only one stock exchange per country would be allowed to exist, which led to deeply entrenched monopolistic stock exchanges per country.²⁷⁵ This illustrates that not all securities regulations acted as a control mechanisms for the investment industry. In fact, that same industry was of course also heavily organized as an interest group (often organized around a membership-based exchange, as explained before).

For firms that are however not capable of overcoming the costly monopoly rents to use such central exchanges, off-exchange transactions are preferred (generally known as over-the-counter transactions).

²⁷² Karel Lannoo, *Updating EU Securities Market Regulation: Adapting to the Needs of a Single Capital Market* (Centre for European Policy Studies 2001).

²⁷³ James McAndrews and Chris Stefanadis, ‘The Consolidation of European Stock Exchanges’ (2002) 8 *Current issues in Economics and Finance* 1.

²⁷⁴ Franks, Mayer and Wagner (n 211); Peter Gomber and Markus Gsell, ‘Catching up with Technology-The Impact of Regulatory Changes on ECNs/MTFs and the Trading Venue Landscape in Europe’ (2006) 7 *Competition and Regulation in Network Industries* 535.

²⁷⁵ Scott McCleskey, *Achieving Market Integration: Best Execution, Fragmentation and the Free Flow of Capital* (Butterworth-Heinemann 2004).

2.3. Emergence of securities processing providers (custodian banks, clearinghouses), and their intermediated access

Central infrastructure theoretically thus allows fulfilling a search function. But the fact that most trades take place through intermediaries (final contracting parties are anonymous to each-other) and that equity is largely a standardized or even a commoditized instrument, also allows closing the transaction instantly. Exchanges thus have and had a joint search and instant contracting function – although these functions can theoretically be unbundled.

The processing of such finalized transactions was initially very much a physical activity, which required handing over the shares between the parties involved, or which required mutations in share registers. The former system, with handovers of physical papers, was dominant in most countries. Parallel to brokers and their mutualized exchanges, a system and dependency would emerge with intermediaries for holding such physical papers on behalf of end-investors and with centralized institutions to administer netting transactions between these intermediaries.

Service providers started to offer physical safekeeping and holding services on behalf of other parties, as investors needed a safe place to keep such valuable stock certificates. This service is generally known as custody, and banks with their vaults were initially a natural option. This service was also often offered by stock exchanges. In fact, they sometimes even forced their participants to use this system and to immobilize the physical securities or their certificates, so that physical movements would be eliminated or merely tracked by bookkeeping mutations. This forced the users to enter into systems that were costly and cumbersome to switch from one to another. At stock exchange buildings like the early New York Stock Exchange, there would be vaults located in the basement of the building, to protect the stock certificates.²⁷⁶ As trades happened through intermediaries anyway, who executed many buy and sell transactions for the same stock (depending on different instructions from different clients), not all transactions had to result in settlement mutations (change of legal ownership claims for the stocks that were in the vault): the practice of clearing allowed to calculate only a single balance. This then still didn't require settlement by means of physical movement of stocks between different safekeeping service providers, but merely a change in legal claim.

Using such a bookkeeping practice also decreased the risk of fraud and forgeries, which was very well possible under a system of trading with physical certificates. But it made the trading in a certain stock even more subject to closed networks, and engaging in a

²⁷⁶ Martin Aronstein, 'The Decline and Fall of the Stock Certificate in America' (1978) 1 University of Pennsylvania Journal of International Law 273; Alec Benn, *The Unseen Wall Street of 1969-1975: And Its Significance for Today* (Greenwood Publishing Group 2002); Bernard McSherry, Berry K Wilson and James J McAndrews, 'Net Settlement and Counterparty Risk: Evidence From the Formation of the NYSE's Clearinghouse in 1892' <http://economics.rutgers.edu/dmdocuments/BernardMcSherry_Slides.pdf> accessed 22 May 2013; James T Moser, 'Origins of the Modern Exchange Clearinghouse: A History of Early Clearing and Settlement Methods at Futures Exchanges' (Federal Reserve Bank of Chicago 1994) Working Paper Series, Issues in Financial Regulation 94-3 <<http://econpapers.repec.org/paper/fipfedhfi/94-3.htm>> accessed 22 May 2014.

trade implied a dependency on a participant in such infrastructure. It would become very difficult or uninteresting to transact with someone who was outside the system.

Before, this system had already been used in banking.²⁷⁷ In the London market, the first bank clearing house was for instance founded in 1773²⁷⁸. And the system was even used in trading practices with physical goods, as soon as the 13th century when the first clearing system was established in France.²⁷⁹ A reason that stock exchanges created new entities or new departments, instead of partnering with a custodian bank that already offered this service anyway, can be explained by a desire not to favor any specific bank, which were also market participants after all. However, in some markets, existing custodian banks took this role.

The first clearinghouse for stock trades was established in 1874, for the London stock exchange.²⁸⁰ And in 1892, one century after the famous Buttonwood Agreement, the New York Stock Exchange also took early steps to improve clearing and settlement by also creating a clearinghouse. It was only following the growing trading volume after World War I, that the Stock Clearing Corporation was established: a clearinghouse that was actually a separate legal body that would require the same participants (intermediaries) as the market operator itself.²⁸¹ Theoretically, as an administrative service and potentially also an in-house safekeeping service, a clearinghouse can/could even be an independent entity that clears multiple exchanges, and that can also offset positions at a different exchange; and perhaps it is also important to note that one exchange might theoretically connect to multiple clearinghouses. This all allows to reduce the costs that intermediaries face when they would have to join different clearing and safekeeping systems per different exchange. It thus makes it more interesting for an intermediary to join an exchange as a participant (this then improves the positive network effects as traders want to trade where other traders trade). This would particularly be interesting since joining such trade processing institutions would also come at a high cost (i.e. margin fund requirements would come into existence). Today, some exchanges, like MTS Italy, even allow their participants to decide which clearing member to engage, and these different clearing members recognize each other (LCH.Clearnet and CC&G in case of the MTS exchange).²⁸² In that model, the CCP of the buyer can be another CCP than the one of the seller, and they then form links between them respectively. This is a form of coordination, that overcomes the prohibitively high cost that individual transactions costs may otherwise have.

²⁷⁷ Moser (n 276).

²⁷⁸ WE Spahr, *The Clearing and Collection of Checks* (The Bankers Publishing Co 1926).

²⁷⁹ E Nevin and EW Davis, *The London Clearing Banks* (Paul Elek 1970).

²⁸⁰ William Stanley Jevons, *Money and the Mechanism of Exchange* (Kegan Paul, Trench, Trubner 1930).

²⁸¹ Frederic Ernest Richter, 'The Stock Clearing Corporation' (1920) 34 *The Quarterly Journal of Economics* 538; Emily Case and others, 'The Effect of Centralized Clearing on Market Liquidity: Lessons from the NYSE' <http://www.vgsf.ac.at/fileadmin/user_upload/P/clearing4.pdf> accessed 22 May 2014.

²⁸² International Monetary Fund Monetary and Capital Markets, *Italy: Technical Note on Financial Risk Management and Supervision of Cassa Di Compensazione E Garanzia S.P.A.* (International Monetary Fund 2013).

The increased costs to join a clearinghouse or to join the safekeeping services of an exchange would be explained by the inclusion of other services: central counterparty services for instance. This is an insurance mechanism through the legal notion of novation: after sellers' and buyers' intermediaries have been matched on the trading floor –and where a contract has thus been closed– the parties of that contract would be replaced by a central counterparty that would act as a buyer to every seller and a seller to every buyer. That central counterparty is financially strong enough (much stronger than a single intermediary) to honor every trade, even if one of the participants defaults. This creates trust in the market, and creates an even bigger inflow of participants. The cost of joining such clearinghouse – central counterparty would be considerable (or at least the required capital and securities deposits would be considerable). For instance, these services would raise their requirements regarding participants' minimum capital to minimize the risk that a broker would default under a system where the clearinghouse guarantees the transaction to the other party. Another “value added” role besides the central counterparty service, and which is a direct result from acting as a counterparty to every trade, is providing the interface or the interconnectedness to the settlement providers (i.e. by acting as agents and holding accounts in Central Securities Depositories – CSD, or to work through settlement agents that are member of such CSDs).

The practice of operating an insurance mechanism like a central counterparty, namely as a party that takes the role of buyer to every seller and the role of seller to every buyer for every transaction, already originated at the end of the 19th century in France and Germany. It was however to agricultural product exchanges that such “central counterparty” clearinghouses started to offer their services (Caisse de Liquidation in Paris, Havre, Lille, and Roubaix and Liquidationskasse in Hamburg²⁸³). The idea thus also found its way to stock exchanges. The role of central counterparties and clearinghouses (as a netting provider) has since then sometimes been combined in a single entity, but this has certainly not always been the case and it should be understood that it does not have to be the case either to be able to perform those two functions: they can perfectly both be offered separately, even with two separate legal entities.

Today, the cost model to participate in the services of clearinghouses, is often still through a high one-off membership fee, but no annual fixed fees: this reflects their mutual nature although clearinghouses like Eurex Clearing and Deutsche Börse's CCP are only owned by the exchange.²⁸⁴ But the heavy requirements and fees mainly come from the fund contributions to cover the insurance and risk management mechanism against default for the central counterparty service. Examples to join a today's clearinghouses and counterparties are:

²⁸³ C Karyotis, 'Histoire de La Compensation: De La Monnaie Aux Titres' (2008) 91 *Revue d'économie financière* 77; Randall S Kroszner, 'Can the Financial Markets Privately Regulate Risk?: The Development of Derivatives Clearinghouses and Recent over-the-Counter Innovations' (1999) 31 *Journal of Money, Credit and Banking* 596.

²⁸⁴ International Monetary Fund, *Germany: Financial Sector Assessment Program-Detailed Assessment of Observance of Isoco Objectives and Principles of Securities Regulations* (International Monetary Fund 2011).

- EquityClear, requires a contribution to the default fund of minimum £1,000,000 (rule 32 of EquityClear Default Fund Rules).
- EMCF specifies individual's contribution to the clearing fund to be the highest of (Rulebook 2009, and Regulation: Clearing fund, 2010):
 - The applicable base deposits are EUR 1,000,000 for a Direct Clearing Participant (DCP) and EUR 3,000,000 for a General Clearing Participant (GCP)
 - A percentage (7.5%) of an average amount of the end of day Aggregate Margin during the immediately preceding 30 Clearing Days
 - A percentage (7.5%) of an average amount of the end of day Aggregate Margin during the immediately preceding 250 Clearing Days

Joining clearinghouses is also partly costly because they are expensive to run, as they also need to comply with stringent licensing requirements. In France for instance, clearing houses must be licensed as credit institutions or be operated by a credit institution.²⁸⁵ Thus, effectively it is a credit institution within the Banking Directive point of view. Also Eurex Clearing AG in Germany has a banking license according.²⁸⁶ Requiring CCP clearinghouses to have a banking license is logical due to their immediate access to liquidity that has been contributed by their participants, and the collateral it therefore manages. However, today there is also a demand to put such institutions under oversight regimes as these centralized infrastructures are considered to offer a good information channel to monitor and control the systematic risk in some parts of the financial industry. For this reason, especially in the domain for derivatives. The recent EMIR regulation foresees regulation to monitor systematic risks, through such centralized information source. But besides for derivative instruments, there are no Europe-wide harmonized regulations for clearing and counterparty services specifically. As long as no market failures need to be addressed, there is also no immediate need for it, and it is yet unknown if future rules will need to address potential monopoly failures that may result from the changes in the landscape.

However, besides those costs and contributions, those services also impose solvency requirements to the participants. Examples of capital requirements that come on top of such fees:²⁸⁷

- EMCF requires capital of no less than the highest of 1) EUR 25 million or EUR 7.5 million (depending on being general, direct or individual clearing member); or 2) 10% of 30-day average Aggregate Margin requirement; and 3) 10% of 250-day average Aggregate Margin requirement.
- EuroCCP has a minimum capital requirement of EUR 70 million Excess Regulatory Capital or EUR 20 million Excess Regulatory Capital (depending on being general, direct or individual clearing member).
- LCH.Clearnet SA requires capital requirements ranging from EUR 25 million to EUR 37.5 million, based on the number of its Trading members, while for an ICP, LCH.Clearnet SA demands a capital of EUR 10 million.

²⁸⁵ Article L. 440–1 of the French Monetary and Financial Code

²⁸⁶ Article 1 Section 1 (12) and Section 31 of the German Banking Act

²⁸⁷ Siyi Zhu, *Is There a 'Race to the Bottom' in Central Counterparties Competition?: Evidence from LCH.Clearnet SA, EMCF and EuroCCP* (De Nederlandsche Bank 2011).

Of course, such amounts explain why it is only possible to participate in such systems through intermediaries. But at the same time, the high cost of such mechanisms forces intermediaries to be selective and to limit the central infrastructure to which they connect. For the end user, joining intermediaries that are connected to one or more central institutions (possibly also via intermediaries), dictates the markets where he could ultimately trade.

However, apart from the administrative clearing function, those central securities processing functions (safekeeping and central counterparty services to guarantee trades) are recognized by economies of scale. Both for those institutions, as well as for the participants, it is less costly to only have a limited number of those institutions instead of duplicating the costs to operate multiple ones in parallel. Although they started as vertically integrates services within a single exchange, there would be a trend towards national institutions. But for some countries, this did not have a difference as some countries would also only have one national exchange.

Such an early “central” (national) securities depository (CSD) was established in France in 1942, namely the *Caisse centrale de dépôts et de virements des titres*, and most European CSDs would be established in the 1960s (although in some countries, it would take longer: in the UK it would take until 1996 when CREST was created, and more than a depository, CREST would actually be rather a central service to keep share registries).²⁸⁸ Just like exchanges, national governments always had a role in such industries that relied on (natural) monopolies, for instance through only running, allowing or licensing one depository.

In the US it would be a crisis that would lead to the creation of a central CSD (just like the great depression led to the creation of federal securities regulations), namely several paperwork crises that even forced the New York Stock Exchange to close for several days to process the backlogs in the late 1960s and early 1970s.²⁸⁹ US Congress and the SEC created a central service provider, under the form of the Depository Trust Company (DTC) in 1973, together with legal amendments in 1975 that would encourage financial institutions to use the DTC and thus to unify the national market system.²⁹⁰

The path dependent bottom-up emergence (instead of a creation by way of laws and statutes) of most market infrastructures –first per exchange and then per country– also led to the development of different practices for securities processing. When electronic processing emerged, which will be discussed later, non-electronic processing merely converted into electronic processing but the procedures and trading formats at clearinghouses and (central) securities depositories stayed very individual and specific.²⁹¹ But as this electronification then allowed to reach yet larger scales than

²⁸⁸ Diana Chan and others, ‘The Securities Custody Industry’ (ECB 2007) 68

<<https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp68.pdf>> accessed 22 May 2013.

²⁸⁹ Wyatt Wells, ‘Certificates and Computers: The Remaking of Wall Street, 1967 to 1971’ (2000) 74 *Business History Review* 193.

²⁹⁰ Virginia B Morris and Stuart Z Goldstein, *Guide to Clearance and Settlement* (Lightbulb Press 2009).

²⁹¹ Alistair Milne, ‘Standard Setting and Competition in Securities Settlement’ (Bank of Finland 2005) Research Discussion Paper 23/2005

individual countries, this inhibited interconnections. A need for forced coordination through standardization would emerge. Nonetheless, some generic procedures emerged over the years which could be used across different trading and post-trading communications. Later, I will however discuss how European law- and policymakers try to improve the economies of scale even more by forced coordination efforts. But in contrast to the United States, this did not lead to a single institution. Also, the threshold to use such infrastructure would remain high – and the need to use an intermediary would remain. As a result, the advantages of such central and coordinated efforts would be out of reach for most companies.

3. ICT lowers the cost of coordination mechanisms, but faces regulatory barriers

The regulations and infrastructure that emerged are completely out of reach of SMEs. We observe that the existing market infrastructure to reach out to unidentified investors, and the legal infrastructure to support and regulate that, mainly catered to large established companies. The legal infrastructure and market infrastructure that once served for open capital calls now only fulfills a marginal function for fundraising for smaller companies. When ICT arrived, the costs of transactions and of running infrastructure would be reduced and it should theoretically be possible to make this more accessible to such SMEs and their investors. Internet platforms can for instance create a level of liquidity in otherwise illiquid spaces – Secondmarket.com is an example of a successful internet platform that has emerged.²⁹² A wide emergence of internet platforms is however not the case. While ICT and today also the internet can enhance allocative efficiencies, there are substantial regulatory barriers that are the result of path dependency.

3.1. Regulations that hinder open calls in the internet age

There is still a need and desire for SMEs and growth firms to use open calls to address unidentified investors in the crowd. The channel that regulations leave accessible, namely promotion through interpersonal networks, may not lead to a suitable investor. The intention to channel sales efforts to regulated intermediaries, and to reach an extended social network, is ineffective in a landscape where high quality intermediaries have disappeared. Also an investor's (extended) social network may not become aware of suitable investees. An open capital call is for such firms prohibitively expensive under the current regulations, despite the decrease in tools to reach a large audience (internet mainly) and despite their willingness to find investors in a coordinated way instead of having to use individualized channels.

<http://econpapers.repec.org/paper/hhsbofrdp/2005_5f023.htm> accessed 13 June 2013; Alistair Milne, 'The Industrial Organization of Post-Trade Clearing and Settlement' (2007) 31 *Journal of Banking & Finance* 2945.

²⁹² Jose Miguel Mendoza and Erik PM Vermeulen, 'The "New" Venture Capital Cycle (Part I): The Importance of Private Secondary Market Liquidity' (2011) *Lex Research Topics in Corporate Law & Economics* 2011-1 <<http://papers.ssrn.com/abstract=1829835>> accessed 8 July 2013.

When it comes to finding wealthy individuals, like business angels, the problem is that they are difficult to find. They rarely publicly profile themselves as “investor”. This is therefore basically finding a needle in a haystack. And the problem multiplies if one needs multiple investors like that. Also, once they are found, these investors have access to much better risk adjusted return instruments than the entrepreneur’s business idea can ever generate. So, finding them is difficult to start with, but once they are found it’s also time consuming to build up an individual relationship with them to convince them about the potential of a venture. This is time consuming, and especially costly. This slow and costly (individualized) process to find investors, severely impacts innovative businesses and results in a number of firms that whither while searching for capital.

Non-institutional and informal investors are thus particularly hard to locate and identify if one needs to go through interpersonal networks. Information flows between entrepreneurs and potential investors are very inefficient.²⁹³ Also, there are not many brokers like boutique investment banks that can extend such search in interpersonal networks.

Also, insufficient venture capital money is available in such interpersonal networks: a persistent lack of capital is documented by various studies.²⁹⁴ Also, the venture capital model in itself is sometimes criticized for other factors that keep it away from funding socially desirable ventures, for instance because of time horizon issues. This demonstrates an inherent weakness of the venture capital model as it is de facto a form of maturity transformation: money from investors is due on a shorter time horizon (even if it is ten years) than the lockup length in the investees. Equity has indeed a rather “eternal” maturity except if a buyer for this equity can be found (but due to the lack of IPOs, a negative feedback mechanism lowers the attraction to invest in venture capital). And in a situation with substantial capital risk (namely the risk that a company would face problems due to the lack of finding follow-on capital), many venture capitalists are shifting towards post-breakeven and later stage deals (growth equity).²⁹⁵

²⁹³ John Freear, Jeffrey E Sohl and William E Wetzel Jr., ‘Angels and Non-Angels: Are There Differences?’ (1994) 9 *Journal of Business Venturing* 109; Colin M Mason and Richard T Harrison, ‘Informal Venture Capital: A Study of the Investment Process, the Post-Investment Experience and Investment Performance’ (1996) 8 *Entrepreneurship & Regional Development* 105.

²⁹⁴ Bjornar Reitan and Roger Sorheim, ‘The Informal Venture Capital Market in Norway? Investor Characteristics, Behaviour and Investment Preferences’ (2000) 2 *Venture Capital: An international journal of entrepreneurial finance* 129; Allan L Riding and Dominique M Short, ‘Some Investor and Entrepreneur Perspectives on the Informal Market for Risk Capital’ (1987) 5 *Journal of Small Business & Entrepreneurship* 19; Robert J Gaston, ‘The Scale of Informal Capital Markets’ (1989) 1 *Small Business Economics* 223; Richard T Harrison and Colin M Mason, ‘International Perspectives on the Supply of Informal Venture Capital’ (1992) 7 *Journal of Business Venturing* 459; Hans Landström, ‘Informal Risk Capital in Sweden and Some International Comparisons’ (1993) 8 *Journal of Business Venturing* 525; Freear, Sohl and Wetzel Jr. (n 293).

²⁹⁵ Richard Titus, ‘Start-Up 100: What’s Wrong with European Venture Capital?’ *The Telegraph.co.uk* (15 February 2011) <<http://www.telegraph.co.uk/technology/technology-startup100/8325627/Start-Up-100-Whats-wrong-with-European-venture-capital.html>> accessed 22 May 2013; Vermeulen and Pereira Dias Nunes (n 168).

Also companies that have received first rounds of financing from venture capitalists before, may now even face the situation that their initial venture capital provider has frozen its investment activities (or has stopped its operations). Not only do they have to overcome the difficulties to find a new investor, potentially without previous relationship, but also do they face the problem of having to find funds in a largely vacated market.

On top of that, an equity gap can also exist for deals that are too large for many private investors, but too small to justify time commitment and investment risks for venture capitalists. Finding a number of (opaque) private investors can however come at a prohibitive cost. This capital risk thus creates a negative feedback loop that may prevent investors from investing in the first place.

However, spreading investment over a large pool of investors that only invest relatively small amounts, may act as an insurance mechanisms even if a venture fails. Also, some investors may want to invest for rather altruistic reasons, even if they may not get a return themselves. Society may have an advantage from it.

Internet brings a megatrend that allows addressing some information inefficiencies. Internet can for instance facilitate open calls (potentially linked with a standard deal), and the cost-effective coordination between a large group of individuals. But the high thresholds in promotion regimes leave the potential of this communication channel largely underused. Regulations that set a minimum level of quality signaling are obviously motivated by a desire to prevent market breakdown and to prevent adverse selection. They address market failures due to distrust. More specifically, they combat information failures from sellers and issuers that would not disclose enough information to let investors separate good firms from bad (or even fraudulent) firms, which would ultimately result in a situation where investors take a safe bet and categorize all firms as bad firms in their valuation. But this would of course frustrate the good firms who would ultimately withdraw from the market. A “market for lemons” is the result.²⁹⁶ And lawmakers deemed the sunlight theory the most suitable option to address this failure. Setting the bar high for open capital calls is also often justified by the need to protect individuals in the welfare state, as well as by the false assumption that capital would be available in the network-based promotion channels (with venture capital funds and identifiable private investors).

In Europe, firms need to produce and register a prospectus with a national regulator in case of an open call. This is foreseen in the national laws that implement the Prospectus Directive²⁹⁷, and in country-specific regulations. Under those prospectus regimes, the transactions incur expensive advisory fees, and the costs are therefore prohibitively expensive for relatively small companies.

The European prospectus rules from Prospectus Directives 2010/73/EU and 2003/71/EC only apply for public offerings that exceed a value of €5m, as can be read in article 1, 2 that sums up where the Directive does not apply:

²⁹⁶ Akerlof (n 35).

²⁹⁷ 2003/71/EC and 2010/73/EU

“(h) securities included in an offer where the total consideration of the offer is less than [EUR 5 000 000], which limit shall be calculated over a period of 12 months;”

Also, as “securities” are envisioned, it might be debatable if the Prospectus Directive applies to stakes in company types that are widely used by small and startup companies. Many of those companies use “cheap” company types, like private and closely held company types that are the cheapest company types available that also “buy” limited liability. But such company types generally include restrictions on the transferability of shares or other ownership stakes. Generally, only the corporate entity type has received a standard set of investor protections which therefore makes it admissible to sell stakes openly and to trade stakes without the consent of the firm itself. Corporate regimes offer a state-provided standard to create ex-ante trust and confidence among investors that would otherwise not have individual negotiation and due diligence means. But as other entity types may lack such standard protections, they may also be forbidden from offering units to anonymous members of the public. The Prospectus Directive does however only apply to transferable securities. A problem is however that there is no uniform interpretation for the classification of such ownership stakes – they are often considered not to be transferable securities but this is not a general rule. For instance, participations in German GmbH limited liability companies or German KG/GmbH&Co KG partnership are not considered securities under the Prospectus Directive, and thus does the Directive not apply to these.²⁹⁸ But other entity types of other countries may be interpreted differently.

However, in cases where the Prospectus Directive does not apply, which is certainly the case below €5 million, it does not prohibit member states from creating their own regime for public offerings. Such national regimes may be more or may be less restricting than the directive-regime (or they may even be identical). In some occasion, having a country-specific regime in that sub-€5 million band, may sometimes create an expensive country-specific compliance cost but it may as well create a country-specific opportunity.

Some European countries have chosen not to implement a country-specific public offering regime, for instance by making no difference between sub-€5 million offerings and offerings that exceed the threshold. The latter case is for instance reality in Austria.²⁹⁹ But other European countries have actually implemented an exempted public offering regime for sub-€5 million offerings. In The Netherlands for instance, a public offering below €2.5 million is only subject to a notification procedure, but no registration or prospectus publication is required.³⁰⁰ A serious compliance problem in Europe is thus the wide set of different regimes in this sub-€5 million area. Especially when the internet is used, which is cross-national by nature, is it very undesirable to

²⁹⁸ Marcus Best and Jean-Luc Soulier, *International Securities Law Handbook 3e Revised* (Kluwer Law International 2010).

²⁹⁹ Please note, the Austrian Capital Market Act even requires a notification in cases where the Prospectus Directive imposes the Europe-wide exemptions from article 3, paragraph 2 (Austrian Capital Market Act, article 13).

³⁰⁰ Exemption Regulation on the Dutch Law on Financial Supervision, article 53

face many different regimes, and to be forced to limit a campaign to one country because of its particular regime.

But still, to have a common layer of EU-wide exemptions, even in that sub-€5m category, the Directive contains some exemptions to the prospectus obligation in article 3 paragraph 2, which apply irrespective of the €5 million threshold:

“The obligation to publish a prospectus shall not apply to the following types of offer:

- (a) an offer of securities addressed solely to qualified investors; and/or
- (b) an offer of securities addressed to fewer than 150 natural or legal persons per Member State, other than qualified investors; and/or
- (c) an offer of securities addressed to investors who acquire securities for a total consideration of at least EUR 100 000 per investor, for each separate offer; and/or
- (d) an offer of securities whose denomination per unit amounts to at least EUR 100 000; and/or
- (e) an offer of securities with a total consideration in the Union of less than EUR 100 000, which shall be calculated over a period of 12 months.”

The 'qualified investor' notion is now aligned with the notions of the MiFID directive. This means that a qualified investor is an investor who is, or who may elect to become, a professional client or eligible counterparty. MiFID allows professionals to request non-professional treatment and vice versa. For instance, high net worth or sophisticated individuals who have elected to become professional clients. This requires however to satisfy with at least two of the three quantitative tests prescribed by MiFID. The exemptions in disclosure regimes towards qualified investors rely on a proxy that effectively implies that only rich people would be able to assess the risks of an investment –or pay for help from service providers– without requiring any help from the lawmaker. The wealth measure is a creation of the American SEC in the early 1980s, and it is a flawed proxy to demarcate the line between a group that has full responsibility to solicit individualized information themselves and an anonymous group that gets full protection and is supposed to receive all material information automatically.

In general, those exemptions thus express two alternative channels: namely promotion through interpersonal networks where individual negotiations and due diligence are possible, or open calls of a very limited nature.

And despite the primacy of supranational law, some countries have still managed to goldplate regulations on top of these exemptions. They do this by regulating other means of communications that the entrepreneur will inevitably make to promote the offering. For instance, in the United Kingdom, there are rules that relate to financial promotions, irrespective if this takes place outside a prospectus context or not. Under the Financial Services Market Act 2000 (mainly articles/sections 21, 86) and the UK Financial Promotion Order 2005, someone who undertakes a public inducement (to engage in investment activity) in the course of his business activity, should obtain an authorization from an FSA authorized person for the content of the communication. And although a prospectus is not required to get the inducement approved by such an authorized person, it will still need to meet prospectus standards before such an authorized person will approve it. This requirement does however not apply if the

public inducement is taking place by someone who is FSA authorized; if the public inducement is addressed to investment professionals; if the public inducement is addressed to persons in the business of placing promotional material; if the public inducement is addressed to certified high net worth individuals; if the public inducement is addressed to sophisticated investors; or if the public inducement is addressed to associations of high net worth or sophisticated investors. This is not exactly the internet crowd.

Thus, if firms want to engage in a internet-based promotion, it seems very simple at first sight: they have to build in certain blocking functionalities - to make sure that the offering does not reach beyond the qualifying public³⁰¹, and obviously, they also have to make sure that the offering complies with certain euro thresholds. Of course, many firms and platforms would like to see a higher threshold instead of €100 000 in the European Union over any 12 month period, as €100 000 will not materially offer sufficient means for many companies.

In the United States, Regulation D and A offer exemptions from federal prospectus requirements, together with a number of more specialist circumstances where federal exemptions exists (i.e. carrying out 80% of the business within incorporation state boundaries). Regulation A of the Securities Act of 1933 offers the “conditional small issues exemption”,³⁰² that offers room for an open call. It exempts offerings of securities of not more than \$5 million from the regular SEC registration if an offering statement (a simplified disclosure statement) is filed with the SEC and if each buyer of the issue gets an offering circular (similar to a prospectus, but simpler to produce) before the confirmation of the sale. There are no limits or restrictions on the use of general solicitation or general advertising under this exemption, and no pre-existing, substantive relationship between the issuer and investor is required, and they may also freely trade on the secondary market after the offering. But if the offering under Reg. A would result in more than 500 shareholders after the transaction, then the company will have to comply with the Exchange Act reporting obligations, like a listed company. It will also prohibit using the Reg. A exemption again in the future. This may be a problem for publicly well-known firms, like consumer web companies, whose shares are in popular demand in secondary markets (eventually without the consent of the firm itself). Facebook can serve as an example, as it crossed the 500 shareholder mark due to the popularity of its shares on SecondMarket.com, even before going public through an IPO.³⁰³ But at least, for many firms it can offer the possibility to test the waters and to gain valuable insight in the public interest in the company. Such offerings are commonly known in the US as investor direct offerings or direct public offerings (DPO – which can also be seen as DIY public offerings). This then refers to the fact that no underwriter is used compared to traditional IPOs. In general, Reg. A offerings have shown to be unpopular. According to William Hambrecht, a venture capitalist in Silicon Valley, only 13 companies made use of the Reg. A option between 2005 and 2010.³⁰⁴ An

³⁰¹ Raj Panasar and Philip Boeckman, *European Securities Law* (Oxford University Press 2014).

³⁰² Rule 251 to 263

³⁰³ Steven M Davidoff, ‘Facebook and the 500-Person Threshold’ (*New York Times DealBook*, 3 January 2011) <<http://dealbook.nytimes.com/2011/01/03/facebook-and-the-500-person-threshold/>> accessed 22 November 2012.

³⁰⁴ William R Hambrecht and Steven N Machtiger, ‘Response to Testify at Hearing “A Proposal to Increase the Offering Limit under SEC Regulation A”

example of a company that used Reg. A for a crowdfunding campaign before the word came into existence, is for instance Spring Street Brewing Co., from Manhattan. They raised \$1.6 million through a Reg. A offering in 1995. It was one of the very first firms to use the internet as a tool to make its offering public. The Securities and Exchange Commission (SEC) granted Spring Street permission to use the internet, as a part of the fundraising undertakings.³⁰⁵

The Reg. D's exemption also still requires that information and disclosures must be provided. Also a notification must still be filed with the SEC (Rule 503), within 15 days after the first securities sale, but failure to do so does not obstruct the use of the Reg. D exemption.³⁰⁶ The three rules, under which Reg. D may apply, are Rule 504, Rule 505 and Rule 506. Under Rule 504, an issuer may sell up to \$1 million of securities to an unlimited number of persons. However, until recently, a general solicitation or general advertising (including on the internet) prohibition applied, together with resale limitations, although Rule 504 allowed a few situation where these limitations and prohibitions did not apply, thereby relying on the state regulation of the state(s) where an offering took place. State-specific securities regulations (named "Blue Sky" regulations in the US) could directly or indirectly hinder the access to the public.

Under Rule 505, up to \$5 million of securities may be offered to accredited investors, plus 35 non-accredited investors. And under Rule 506, an unlimited number of securities may even be offered, to accredited investors, plus 35 non-accredited investors, if those non-accredited investors have sufficient knowledge and experience to be capable of evaluating the merits and risks of the prospective investment. And unlike a small number of situations in Rule 504, it was never allowed to use general solicitation or general advertising (which includes websites), and resale limitations always applied, in a Rule 505 or Rule 506 offering. A pre-existing, substantive relationship between the issuer and potential investor was always required, or had at least to be set up first. This thus required promotion through interpersonal networks instead of open calls. Therefore, Reg. D was a suitable exemption for private placements, but it is not a suitable instrument for internet based offerings to a wide public and/or in multiple states. Just like the other exemptions in solicitation and prospectus regulations, the preexisting relationship requirement has however a channeling effect to not only use interpersonal networks, but preferable to use brokers and intermediaries. As those are then regulated by prudential rules, the process falls again under a form of regulatory control. However, this channeling effect has little use when there are few specialized private placement intermediaries, as mentioned before.

Thanks to the JOBS Act, the Regulation D regime will now also become possible for offerings that involve "general solicitation" and "general advertising" (and if the rules under Title II instead of Title III of the Jobs Act are used, then this should still be

<http://www.wrhambrecht.com/pdf/Reg_A_Hearing_Response_20101206.pdf> accessed 22 November 2012.

³⁰⁵ David M Cielusniak, 'You Cannot Fight What You Cannot See: Securities Regulation of the Internet' (1998) 22 Fordham International Law Journal 612.

³⁰⁶ Jack S Levin, Martin D Ginsburg and Donald E Rocap, *Structuring Venture Capital, Private Equity, and Entrepreneurial Transactions* (Wolters Kluwer Law & Business 2008).

directed to accredited investors).³⁰⁷ Title II and Title III of the JOBS Act will allow to use general solicitation to raise \$1m through crowdfunding platforms, during any 12 month period, without being subject to regular registration, prospectus, or heavy reporting regimes, besides a special registration or (limited) reporting. The amount that any investor may invest in such a campaign depends upon if the individual's income or net worth reaches the threshold of \$100,000 or not (maximum 5% of income/net worth or \$2,000 or maximum 10% of income/net worth or \$100,000 respectively).³⁰⁸ However, some requirements in the JOBS Act are also considered ineffective.³⁰⁹

In the United States, in cases where a federal rule doesn't preempt state law, offerings still have to comply with the securities regulations of the states where the equity is offered (or where the securities are offered, to put it more general) or at least the state where the company has its headquarters. When sales or offerings are made available to users in a state, in an internet offering, then it is deemed to be made in that state. Potentially, that might be all states if there's no feature that blocks certain functionalities towards users in certain states.

Some states have adopted an identical state-specific regime: the Uniform Securities Act, which requires registration with a state securities authority, who will only accept a registration if a company reaches specific levels of disclosure and if the offering looks fair to them. However, a state who is most well-known for its innovative businesses that need to rely on equity financing, namely California, never enacted the Uniform Securities Act. There are also multiple versions of that act, and there are differences between states in respect to the version of that act that they have enacted.³¹⁰ For instance, these states have enacted the 2002 version, but many more have enacted an older version (of which the '56 version was the most popular one, as you can see on the overview on this website):

- Georgia
- Hawaii
- Idaho
- Indiana
- Iowa
- Kansas
- Maine
- Minnesota
- Missouri
- Oklahoma
- South Carolina,
- South Dakota

³⁰⁷ Karina Sgar, 'Fret No More: Inapplicability of Crowdfunding Concerns in the Internet Age and the Jobs Act's Safeguards' (2012) 64 Administrative Law Review 473.

³⁰⁸ Sara Hanks, 'Online Capital-Raising by Small Companies in the USA after the JOBS Act Compared to the Same Process in the European Union' (2013) 8 Capital Markets Law Journal 261.

³⁰⁹ Stuart R Cohn, 'The New Crowdfunding Registration Exemption: Good Idea, Bad Execution' (2012) 64 Florida Law Review 1433; C Steven Bradford, 'The New Federal Crowdfunding Exemption: Promise Unfulfilled' (2012) 40 Securities Regulation Law Journal 1.

³¹⁰ Edan Burkett, 'Crowdfunding Exemption - Online Investment Crowdfunding and U.S. Securities Regulation, A' (2011) 13 Transactions: The Tennessee Journal of Business Law 63.

- Vermont
- Wisconsin
- US Virgin Islands

Since it would be too costly in an internet-based promotion to obtain multiple authorizations in multiple states (even if those many of those states would adhere to the Uniform Securities Act), and if it would not be possible to rely on a federal rule of exemption that preempts state-specific regimes, then it might be a better choice to look if an offering can fit in an exemption. California's state specific blue sky laws foresee for instance a limited offering exemption: offerings can be made to individuals with a net worth of at least \$1m, with an income above \$200k/year, with a joint income (together with their spouse) above \$300k/year, with a minimum purchase of \$150k (provided they have the capacity to protect their own interest, if they can bear the economic risk, or if that investment does not exceed of the individual or joint annual income), or to officers, directors, promoters, affiliates of the issuer, banks and certain other financial institutions.³¹¹ Besides that, maximum 35 ordinary people may be addressed inside or outside California. Another exemption is an offering to qualified investors. This is only available to Californian partnerships and corporations (or at least to corporations who's business is centered in California and where more than half of the shares are owned by Californian residents), and a disclosure statement is necessary (which has to meet the requirements of reg. D) before securities are actually sold (although a general announcement of the proposed offering may be published - i.e. on the internet - which also triggers a notification with the Commissioner of Corporations unless an initial offer of securities takes place earlier in which case the latter event gives rise to such a notification). Another notice is necessary 10 days after the close of the offering, or 210 days from the date of the initial filing (whichever occurs first). Finally, there's also a Californian exemption for sales to no more than 35 persons, in case only one uniform (common) class of shares is outstanding. There is however a requirement to file a notice. However, this exemption is useless in the internet domain, because the sale may not be accomplished by publication of any advertisement.

3.1.1. Country-specific differences & cross border complexities

Here, I discuss the national regimes that apply to the sub-€5 million offerings, where the Prospectus Directive still leaves national freedom.

In Austria, the EU-wide prospectus regime & exemptions fully applies, even below €5 million.³¹² And in cases where a Europe-wide exemption applies, there is still a notification requirement when securities are offered for the first time: the offerer must inform the Oesterreichische Kontrollbank AG as soon as possible of the issuer, the planned issuing date, the total volume, denomination, life in the case of public offerings and any other conditions as well as, if applicable, of any circumstances that constitute an exemption from the obligation to publish a prospectus.³¹³

³¹¹ Therese H Maynard, 'The Future of California's Blue Sky Law' (1996) 30 Loyola of Los Angeles Law Review 1531.

³¹² Austria's Capital Market Act, article 3

³¹³ Austria's Capital Market Act, article 13

In Belgium, in the non-harmonized area, namely for public offers below €5m, for the offer / admission to trading on regulated market of investment instruments other than transferable instruments, a country specific prospectus is required.³¹⁴ This country-specific prospectus has to contain the minimal information required is also included in the Royal Decree of 31 October 1991, but an offerer can also opt to draft a harmonized prospectus (which opens the possibility to use the passport). Also a country-specific promotion regime exists in article 18 of the Act on the Public offering of securities and the admission of securities to trading on regulated markets offers national sub-2.5m exemptions, but they require to be a cooperative that is recognized by the National Counsel for Cooperation, and the acquisition of a stake in the cooperation is necessary to become entitled to the advantages of the cooperative.

In Bulgaria, the EU-wide prospectus regime & exemptions fully apply, even for offerings below €5 million.³¹⁵

In Cyprus, sub-€2.5 million public offerings are not regulated (and thus do not require a prospectus) following article 3, subsection (2), (h) of the Public Offer and Prospectus Law. (This becomes regulated again if the issuer asks for admission to trading on a regulated market: article 3, subsection (3) of that law).

In the Czech Republic, offerings below €200,000 –and now €1,000,000– (total offering in a period of 12 months) are exempted from the prospectus obligations, according to section 34, subsection 3(g) of the Capital Markets Undertakings Act.

In Denmark, not the full but only certain prospectus requirements apply to offers of non-listed shares (and bonds, options, etc.) when the value of the offer is between €100000 and €5m. The national regime is however largely similar to the EU-wide prospectus regime following Chapter 12 of the Danish Securities Trading Act; together with Executive Order No. 222/2010 and Guidelines No. 9320/2005. The approval of such a prospectus is free of charge (compared to normal prospectuses, that cost DKK 25000 to approve). And offers that are exempt from the prospectus requirements, may be subject to a requirement to have an information memorandum. Shares in private limited companies may not be offered to the public.

In Estonia is an offer with a consideration of less than €2.5m –now €5m– (considered over a 12 month period) eligible to make a prospectus according to a country-specific regulation of the Minister of Finance.³¹⁶

In Finland, the Securities Markets Act does not apply to sub-€2.5m –now €5m– offerings (chapter 2, section 3a, subsection 4), but Ministry of Finance Decree 2005/538 still requires an alternative prospectus (subject to approval) for these offerings. The exemptions to produce that alternative prospectus are more or less the EU-wide exemptions for other offerings (section 6), except that offerings below €1.5m are fully exempted.

³¹⁴ Belgian Law of 16 June 2006

³¹⁵ Bulgarian Law on Public Offerings of Securities, art. 79

³¹⁶ Best and Soulier (n 298).

In France, public limited companies and limited partnerships with share capital (or the foreign equivalents) can raise money for offers below €2,5m (but no more than 50% of the capital of the issuer), without the need for a prospectus. Such offers are not considered as public offerings and are hence exempted.³¹⁷ Also offers to portfolio managers are exempted.³¹⁸

Germany used its national freedom to regulate the sub-€2,5m/€5m offers in such a way that only issuers that are already admitted to regulated market do not have to prepare a prospectus for offers under that threshold. And the Act on the Prospectus for Securities Offered for Sale regulates securities offerings for securities that are not considered to be transferable securities under the Prospectus Directive - individually negotiated financial instruments or participations in GmbH limited liability companies or KG/GmbH&Co KG partnerships, or the foreign counterparts, are not considered securities under the implementation of the Prospectus Act. Also, in Germany, one needs to be aware of a country-specific “prospectus” requirement in the Civil Code that even may apply when a Europe-wide exemption of the Prospectus Directive otherwise exists.³¹⁹

In Greece, article 2 of Law 3401/2005 (which implements the prospectus requirements) excludes offerings of less than €2.5m (considered over a 12 month period) from its scope.

In Ireland, securities under the implementation of the Prospectus Directive are understood to include shares in companies and other securities equivalent to shares in companies, once those securities can be transferred freely by the holder. Part 2, article 8, (h) of the Prospectus Regulations excludes offers that expressly limit the amount of the total consideration to less than €2,500,000, from its scope. It does not contain an alternative regulated regime for such offerings either.

Italy originally excluded offerings below €2.5m (seen over a 12 month period) from the scope of the provisions of Part IV, Title II, Chapter I, of the Consolidated Law on Finance, and from the implementing Title 1 in the Consob Regulation no. 11971. However, recently, Italy implemented a specific “crowdfunding law”, Law Decree n° 179/2012, to specifically regulate the promotions below €5 million in the light of upcoming trends like crowdfunding (which will be discussed hereafter). On March 29th, 2013, the Italian securities regulator (CONSOB) published the Regulation implementing article 30 of the Law Decree n° 179/2012. The regulation requires:

- Individuals and institutions that wish to run equity crowdfunding platform operations must apply to be included in a special register that will list all the equity crowdfunding portals. Existing financial intermediaries and credit institutions will be listed separately.
- A platform operator must meet the integrity and professionalism requirements set by the regulator, as normally required for intermediaries operating in the financial markets (credit institutions and investment firms). Among the requirements, there is the ability of the platform operator to assess the business

³¹⁷ Article 211-2, AMF General Regulation

³¹⁸ Article L411-2-II, 4 of the Monetary and Financial Code

³¹⁹ §§ 311 Abs. 2 and 3, 241 Abs. 2 BGB

- plans submitted to the platform, from an economic and financial point of view rather than a technological – innovation one
- The platform operator must provide retail investors (according to MiFID classification) with a set of mandatory information regarding risks that are associated with investing in young firms (i.e. loss of capital, illiquidity, rarity of dividends, dilution, need for diversification); information and practical instructions about the right of withdrawal; the periodicity and the methods with which they will be provided with information on the status of pledged, the amount subscribed and the number of investors; fees and costs charged to investors; the applicable law and the competent court; the language or languages with which information concerning the offer is provided. The retail investor must demonstrate that they understand the nature of the activity of the portal, the nature and specificity of the financial instruments issued by innovative start-ups and the relative risk of each offer. This basically boils down to the MiFID investor classification.
 - Only innovative startups can use such crowdfunding portals. Ordinary businesses cannot. To qualify as an innovative startup, the company's shareholders must be physical persons and must hold for 24 months the majority of shares and majority of voting rights at the ordinary shareholder meeting. The company may not be active for a period of longer than 48 months. Also, the total value of yearly turnover may not exceed €5 million, the company may not distribute dividends and the business scope of the company is the development and commercialization of innovative products or services with high technological value. There is also a separate sub-category of the innovative start-up with social purposes.
 - 5% of the totality offer is required to be taken up by “professional investors”, credit institutions, financial institutions for innovation and development or innovative startups incubators. This has to take place before the offer to the public is published.
 - In order to protect retail investors, there is an obligation for innovative start-ups to include in their statutes or incorporation documents tag-along rights, thus rights to sell the shares should the controlling shareholders sell their shares to a third party.

In Luxembourg, article 4 of the Act of 10 July 2005 on prospectuses for securities excludes offerings below €2.5m (considered over a 12 month period) from the normal regime, and places such offerings under a regime with a simplified prospectus (article 28 onwards).

Liechtenstein's Securities Prospectus Act (Wertpapierprospektgesetz), article 2, 2 (h) excludes offerings below €2.5m from its scope.

Malta's Companies Act also exempts offerings below €2.5m (considered over a 12 month period) from the obligation to publish a prospectus.

In The Netherlands, there is a layered definition of financial products, which includes amongst other things (i.e. investment objects, etc.) also financial instruments, which also includes securities amongst other things (i.e. units in collective investment schemes). The implementation of the Prospectus Directive only applies to securities,

and some MiFID regulations regarding financial services do not necessarily apply to all financial products, and then this leaves some room to implement country-specific regulation. However, shares in private limited companies are considered as securities, because the degree of standardization is used as an indication to judge the degree of negotiability, which is important to judge if they qualify as securities or not. The fact that shares in private companies can be subject to transfer limitations, does not take away that they are transferable and that they have a certain degree of standardization. Otherwise, regarding prospectus requirements, The Netherlands implemented the national freedom under the Prospectus Directive, namely for offers below €2,5m/€5m, in a very liberal way: these are exempt from the publication of any prospectus. Article 53 of the Act on Financial Supervision's Exemption Regulation exempts offerings below €2.5m (considered over a 12-month period) from the prospectus obligations.

In Norway, the notion of public offers is understood to include both offers for subscription from which the preferential rights are deviated and offers for the sale of securities that are already listed, when the offer is not made specifically to certain individuals. Private offers is when only a limited number of investors are invited to subscribe, but within the scope of the Prospectus Directive, the definitions from that directive apply due to the EEA status of Norway. There are national prospectus requirements for offers below €2,5m/€5m, which are different from the prospectus requirements as they are implemented through the Prospectus Directive.³²⁰

In Poland, articles 7, 3 (6) and 7, 3b of the Act on Public Offering, Conditions Governing the Introduction of Financial Instruments to Organized Trading, and Public Companies exclude issues of less than €2.5m from the requirement to prepare, approve and publish a prospectus.

Portugal considers public offers when it is directed to undetermined persons, or when it is directed to determined persons what are however the generality of the shareholders of a public company, if the offer to those determined persons has been preceded by prospecting, collection of investment intentions or publicity and promotion, or if it is directed at more than 100 (now 150) determined persons. However, besides the other harmonized exemptions (like offers directed to qualified investors), offers for distributions of securities totaling less than €2,5m/€5m are also exempted. Therefore, Portugal used a liberal approach in its freedom under the Prospectus Directive. Regarding instruments that are considered as securities, since 2007, the Securities Code has an open clause which widens the scope of instruments that are considered to be securities (apart from traditional securities, this will now also include other legal documents that represent homogeneous legal relationships that are capable of being transferred in the market).

In The United Kingdom, there is no requirement to issue a prospectus, for offers that do not exceed €2,5m/€5m, but there are however rules that relate to financial promotions, irrespective if this takes place outside a prospectus context or not (the latter must be issued or approved by an authorized person, unless an exemption applies like communications to investment professionals, or communications with self-certified certified high net worth individuals/companies or with certified sophisticated

³²⁰ Best and Soulier (n 298).

investors). This UK-specific Financial Promotion Regime under the Financial Services Market Act 2000 (mainly articles/sections 21, 86) and the UK Financial Promotion Order 2005 requires::

- Someone who undertakes a public inducement (to engage in investment activity) in the course of his business activity, should obtain an authorization from an FSA authorized person for the content of the communication. This effectively imposes prospectus-like requirements. (Note: this requirement also applies to every inducements to engage in investment activity -both public and private- that have an effect in the United Kingdom).
- This does however not apply if:
 - o the public inducement is taking place by someone who is FSA authorized;
 - o the public inducement is addressed to investment professionals;
 - o the public inducement is addressed to persons in the business of placing promotional material;
 - o the public inducement is addressed to certified high net worth individuals; (Enclosed, I provide a certification document - you might have signed something yourself in the past)
 - o the public inducement is addressed to sophisticated investors; (Enclosed, I provide a self-certification document - you might have signed something yourself in the past)
 - o the public inducement is addressed to associations of high net worth or sophisticated investors;

Goldplating (adding burdens to EU laws) is a very typical UK practice.³²¹ The UK has 2.6 implementing documents per EU Directive, in contrast to 1 in Germany and 0.8 in Portugal.³²² The length of implementing documents is in the UK on average also 300% of that of the original EU Directive.

In Slovakia, article 42 of the Market in Financial Instruments Act offers the possibility to use and register a simplified prospectus for sub-€2.5m offerings (considered over a 12-month period). Such prospectus must contain the following information: details of the issuer, amount of the issuance, denomination of the shares, the rights that they offer, and information (financial and non-financial) that should allow investors to make a suitable assessment. And in case one wants to rely on the EU-wide exemptions instead, then this must be notified to the Securities Market Agency, no later than 3 business days before the offering starts (article 52). Also, a copy of the decision to raise the capital must be provided.

In Spain, offers below €2,5m/€5m are considered to be private placements, and are exempt from a prospectus regime.³²³

³²¹ European Parliament, 'Comparative Study on the Transposition of EC Law in Member States' (2007); Sarah Schaefer and Edward Young, 'Burdened by Brussels or the UK? Improving the Implementation of EU Directives' (Foreign Policy Centre and the Federation of Small Businesses 2006).

³²² Francis Chittenden, Tim Ambler and Mikhail Obodovski, 'How Much Regulation Is Gold Plate? A Study of UK Elaboration of EU Directives' (British Chambers of Commerce 2004).

³²³ Spanish Royal-Decree-Law 5/2005, article 30bis

Swedish private limited liability companies and their shareholders are not allowed to attempt, through advertising, to distribute their shares or subscription rights in the company or debentures or option certificates that are issued by the companies. Such companies and their shareholders may not otherwise attempt to distribute said securities by offering the securities for subscription or purchase to more than 200 persons. Shares in private companies are not intended for public circulation. And for public companies, some offerings below €2.5m (considered over a 12 month period) are not considered to be public offerings, and do therefore not require a prospectus.³²⁴

In Switzerland, where the Prospectus Directive does not apply, the notion of public offering isn't even defined in securities laws. Still, article 652a(2) (and article 1156 for bonds) of the Code of Obligations considers any invitation for subscription as public (and requires a prospectus - but there is no approval or registration requirement for the prospectus, only civil liabilities apply if it gives a false picture), unless it is only addressed to a limited group of persons and/or if the investors are contacted individually.³²⁵ Under Swiss law, the type of investor is irrelevant. But that limited group of persons is not defined (except in the context of collective investment schemes, in which case it applies to qualified investors, and if only advertisement methods are used that are customary for that type of investors), although it is generally considered to be not more than 20. Structured products may only be publicly offered in or from Switzerland if they are issued, guaranteed or distributed by a bank (or insurance company or securities dealer) and if a simplified prospectus is available for them. But structured products as such are not regulated.

Besides Switzerland, I also continue to describe the public offering situation in a number of other non-EU countries.

In Canada, the securities laws of the provinces requires a prospectus for the trade (sale, treasury issuance, offer to sell, etc.) in a security when such trade would be a distribution of the security. A distribution involves securities that are issued but that have not previously been issued, the trade of previously issued securities that have been held or controlled by a person with more than 20% of the issued or outstanding voting securities, or securities that have been previously issued but under an exemption from the prospectus requirement. There are indeed private placement exemptions that do not require a prospectus (unlike the public offers). Namely, trades to accredited investors (financial institutions, registered advisers or dealers, individuals or couples who own at least CAD 1m financial assets, individuals whose net income exceeds CAD200,000, couples whose net income exceeds CAD300,000, or a person with net assets of at least CAD 5m) are exempted from the prospectus requirement.³²⁶ Also private issuers do not have to register a prospectus. That is the case when its securities are subject to restrictions on transfer, or when the securities are beneficially owned (directly or indirectly) by no more than 50 persons, and that the securities are only issued to those persons. Also, under this exemption, the securities may only be purchased by persons (or relatives thereof) who have some link with the corporation or who have some qualifying capacity (accredited investors, etc.). Another exemption

³²⁴ Financial Instruments Trading Act 1991:880, article 2:4

³²⁵ Johannes A Buergi, 'New Standards Set For Allocation Of Securities Via Public Offerings' [2004] *World Securities Law Report BNA* 8.

³²⁶ National Instrument 45 106

applies when the minimum investment ticket is at least CAD150,000. But in general, the securities regulator always has the right to exempt an offer from the prospectus regime if it is not prejudicial to the public interest. In Quebec, distributions by an issuer to subscribers that qualify as eligible investors (accredited investors as described two paragraphs earlier, other individuals that meet certain financial thresholds, family, friends, business associates, etc.) is also exempted, if the purchase price does not exceed CAD 10000 and if an offering memorandum is also distributed (such offering memorandum must meet certain requirements, but it is not a prospectus that needs to be registered).³²⁷ The subscriber also needs to sign a risk acknowledgement. In some cases, a notification may however be required (despite the exemption to draft and register a prospectus).

In Mexico, there is an exemption from securities registration and most disclosure requirements for private placements: namely if the offer is made to institutional or qualified buyers (qualified buyers need to have average investments in securities equal or higher than 1,5m UDI, and current income in the last two fiscal years equal or higher than 500,00 UDI) or if the securities are offered for sale to fewer than 100 individuals or entities. However, the securities regulator can also individually exempt offerings, and thus render them private placements (thereby taking into consideration publicity, communication means, type of targeted investors, etc.).³²⁸

In China, the securities law considers offers to be public if securities are issued to non-specified institutions and/or individuals or if securities are issued to 200 or more specified institutions and/or individuals. Such private offers may not be made in a public manner (advertising, public inducement, or otherwise. Public offers of stocks (and obviously also corporate bonds) require prior examination and approval, which includes submitting a prospectus. Options and similar rights are not permitted (not even through a public offer). Equity-based warrants, but they may only trade on a stock exchange (the same stock exchange as the underlying stock in fact). However, there is an exemption to disclose a prospectus if the issue of new shares through private placement happens to less than ten investors.

In Hong-Kong, there is no distinction between public and private offers as such, but there's a distinction between offers from public and from private companies. Private companies may not make invitations to the public to subscribe for any shares or debentures. And offers from public companies have to follow the prospectus regime. Advertisements, invitations and documents for investment products in connection with public offers of investments, require authorization. The securities regulator may offer an exemption from compliance requirements, at the request of the applicant.³²⁹

In Japan, for both private and public offers are there rules regarding two types of instruments: securities and rights that are indicated on a security certificate, and securities and rights not indication on such a security certificate (i.e. units in a collective

³²⁷ Autorité des Marchés Financiers, *Prospectus Exemptions* (Autorité des Marchés Financiers 2006)

<<http://www.lautorite.qc.ca/files/pdf/publications/conso/investissement/Prospectuses-exemptions-AMF.pdf>> accessed 11 July 2012.

³²⁸ Best and Soulier (n 298).

³²⁹ Ibid.

investment scheme). For the first type, offers of securities that are unlikely to be transferred to other investors than qualified and sophisticated investors, are considered private offers. If that's not the case, then a threshold is in place to decide between a public or a private offer: a solicitation to more or less than 50 investors (or a potential to be transferred to more or less than 50 investors), other than qualified or sophisticated investors. For the second type, the threshold between private and public offers, is the number of investors that hold the security: namely more or less than 500. Japan updated its securities law, not so long ago through the Financial Instruments and Exchange Law in 2006.

In Singapore, there isn't anymore a distinction between public and private offers. All offers require a prospectus, except for those exemptions that relate to the terms of the offer or the target offerees: like small personal offers where the total amount to be raised does not exceed SGD 5 million over a 12 month period and where that personal offer may not be accompanied by an advertisement making an offer or calling attention to the offer or intended offer (a personal offer of securities may only be accepted by the person to whom it is made and is made to a person who is likely to be interested in that offer, depending on previous contract or connection between the offerer and offeree); or private placements that target no more than 50 persons within a 12-month period and where that offer may not be accompanied by an advertisement making an offer or calling attention to the offer or intended offer; offer made to institutional investors; offers made to accredited investors and other relevant persons if the ticket is at least SGD 200,000 for each transaction and if the offer cannot be accompanied by an advertisement making an offer or calling attention to the offer or intended offer. Such exempted offers require however a declaration, which is valid for six months. The securities regulator can grant individual grant exemptions on the application of any person interested (this can be granted if the cost of providing a prospectus for an offer of securities outweighs the resulting protection to investors, and if it would not be prejudicial to the public interest if a prospectus were dispensed with for an offer of securities). In fact, the Monetary Authority of Singapore has even the power to issue no-action letters. The definition of securities (and the associated legal requirements like disclosure/prospectus requirements) also includes units in collective investment schemes, as well as units in business trusts, debentures stocks or shares issues by an unincorporated body, etc. In fact even any product or class of products that the securities regulator may prescribe. However, it does not include bills of exchanges and promissory notes, or in fact any product or class of products that the securities regulator may prescribe.³³⁰

In India, a public offering requires a prospectus. However, according to section 67 of the Companies Act, an offer or invitation to subscribe for shares or debentures will not be deemed to be a public offer or a public invitation if these two conditions are satisfied: namely the offer or invitation is not intended to result in shares becoming available for subscription or purchase other than those who have received the offer/invitation, and the offer is a "domestic concern" of the one making and the one receiving the offer. The latter notion is comparable to the UK notion of "domestic concern". Private companies are however prohibited from making public offers or invitations, and can only raise capital through private placement. Private placements are only considered as such, if

³³⁰ Ibid.

the offer is made to no more than fifty persons. Collective investment schemes that raise funds from the public must be listed on a stock exchange (SEBI).³³¹

In Israel, according to section 15A of the Securities Law, an offer to no more than 35 persons, and a situation where no more than 35 persons acquired securities from the offerer in the previous 12 months, is not regarded as a public offer (but as a private offer instead). Sophisticated investors do not count towards the 35 persons. Sophisticated investors are joint investment trusts, funds and their management companies, insurers, banks, portfolio managers, investment counselors, stock exchange members, underwriters, large corporations, etc. Existing controlling shareholders (or managers and directors) and corporations outside Israel do also not count (if they are capable of obtaining the required information to make an investment decision). However, public offers are exempted from prospectus requirements if the offer does not exceed NIS 2,600,000 (a figure that is indexed every year) and the offer does not represent more than 5% of the issued and paid-up capital of the company on a diluted basis, or if the number of offerees and the number of purchasers from previous non-prospectus offers together, does not exceed seventy-five persons.

In Turkey, every kind of offer to the public for the purchase of capital market instruments, inviting the public to participate in a joint stock corporation or act as its founder, continuous trading of shares in stock exchanges or organized markets, or selling shares or stocks of publicly held joint stock corporations to increase capital, are all considered to be invitations to the public to purchase capital market instruments. They require a prospectus. Also, as soon as a joint stock corporation reaches 250 shareholders, it is considered to have been offering the shares to the public, and the provisions for publicly held joint stock corporations start to apply. Private placements of capital market instruments can be done either to institutional investors or high net worth individuals/sophisticated investors, although they still require a registration with the securities regulator (but no disclosure of a prospectus to the public). With respect to units in foreign mutual funds, these institutions and persons are banks, insurance companies, brokerage firms, public pension funds, private finance houses, mutual funds, investment companies, portfolio management companies, and natural and legal persons who own at least TLR2,300,000 capital market instruments. If the total sale price of the capital market instruments is below TLR190,000, the issuer may be exempt from the requirements of preparing a prospectus (and circular) provided that the requisite information is disclosed to the public through a statement that resembles a sample statement from the securities regulator.³³² Unfortunately, public offerings of new shares to raise capital (in circumstances where the preference rights of existing shareholder are restricted), or public offerings of existing shareholders' shares, are not able to benefit from this exemption.

In Russia, in principle, registration at the FSFM of securities issuances and prospectuses is required. The FSFM also approves standards for them. However, some particular instruments will need to be recognized under Article 143 of the Civil Code or other relevant securities laws, to be considered as securities. There are securities issues that require registration with the securities regulator and those which need not be

³³¹ Collective Investment Schemes Regulations, 1999

³³² Communiqué IV/39 regulates the exemptions to issue a prospectus.

registered. Besides this registration requirement for issues, in some cases, the Securities Law also require a prospectus to be registered simultaneously with registration of the securities issue when securities are to be distributed through a public offering or when a private placement to existing shareholders will take place among more than 500 existing shareholders. A prospectus may also be registered if securities are intended to be publicly traded.

3.1.2. The problem of inadequateness of prospectuses

The intentions of promotion regulations are in essence good. They overcome adverse selection problems, by decreasing the information asymmetry. In the absence of them, and in the absence of standard rights that come for instance with standard equity, investors who have no negotiation and due diligence means may lose trust in the market and may assimilate all promotions as potentially bad quality ones. Such information requirements thus create trust in the marketplace. But the function of a prospectus in relation to the typical investor in SMEs may also be questioned. Those investors are certainly “blinded by the light” through information overload.³³³ Actually, prospectuses are less appropriate to create market confidence, than the theory of addressing market failures would like to achieve and the qualitative nature should be adjusted to the destination public.

The content of prospectuses exposes a number of weaknesses:

- The format is long and complex
- The content is mainly of a legal and financial nature, with little room to explain risks that are typical for young high tech companies. Information is in practice also unreadable and full of disclaimers. In fact, they serve as legal and financial document, to limit liabilities. Nonetheless, investors should also be able to access non-financial material information. The fact that prospectuses are more legal documents than material documents, can be illustrated with the existence of listed SPACs (special-purpose acquisition companies) or other empty shells. Such entities have no real operations when they raise funds, but their prospectuses meet the requirements on prospectus regimes to use open calls.

Behavioral finance and economics might declare how investors react with information disclosed to them in traditional prospectuses, keeping in mind the cognitive limitations of every human. Less sophisticated investors, lack the will and competence to read and use the information disclosed to them in a traditional prospectus. They are both unreadable and unread.³³⁴ But behavioral finance also teaches us that investing is full of heuristics: behaving in a stressful world with too much information and too many choices, leads to systematic departure from rationality.

³³³ Troy A Paredes, ‘Blinded by the Light: Information Overload and Its Consequences for Securities Regulation’ (2003) 81 Washington University Law Quarterly 417.

³³⁴ Bruce Alan Mann, ‘Prospectuses: Unreadable or Just Unread? A Proposal to Reexamine Policies Against Permitting Projections’ (1971) 40 George Washington Law Review 222.

The cost for good quality companies to produce a full prospectus is too high.³³⁵ Investor relations are time-consuming and possibly distracting. Complying with the highest information requirements reduces the value of a company if a major part of its budget is spent on compliance (instead of business development or return to investors). Thus, the debate should not be polarized between stricter regulation and deregulation. Advocates of stricter regulation should realize that stricter measures will make it more difficult to finance the economy, and will thus come at a cost for society – even if individuals are better protected.³³⁶ It's not that we have a market for lemons, where good quality firms stay away from the market, it's that we don't have a market altogether. Addressing the information failure resulted in another market failure, under the form of a government failure. Now, if the cost to comply is so high that –although less equity needs to be given up per euro or dollar received– more equity must be sold anyway as more euros or dollars are needed to cover compliance costs, the effect is the same as in a market for lemons: companies stay away from the market. There is also a direct link between an increase in compliance requirements and the decision to stay public or go private.³³⁷ A reduction in administrative costs of 25%, is expected to lead to an increase in the level of GDP of 1.5%.³³⁸

One recommendation, which does certainly not pretend to be conclusive, can be to use a more proportional disclosure instrument for SMEs, under the form of a summary prospectus.³³⁹ This is also supported by CESR in its technical advice at level 2 on the format and content of key information disclosures for UCITS Inspiration for a summary prospectus can for instance be found in UCITS IV.³⁴⁰ Summary prospectuses that do not offer the full information, but that only serve as a lead generation should also not be considered as advertisements under the Prospectus Directive. Main features of such a summary prospectus should certainly be the use of the English language (cfr. European patent discussion). The current translation regime under the Prospectus Directive and Transparency Directive is too complex. Also, the cross-reference list should be suppressed and the use of a website instead of (only) a paper document should be mandatory.³⁴¹ Also the content that is today already the de facto standard to communicate towards prospective investors in interpersonal networks, namely business plans, may be considered as a recognized format to fulfill such summary

³³⁵ Anita Anand and Peter Klein, 'The Costs of Compliance in Canada's Securities Regulatory Regime' (2003) <http://www.wise-averties.ca/reports/WPC_11.pdf> accessed 22 May 2014; C Steven Bradford, 'Does Size Matter-An Economic Analysis of Small Business Exemptions from Regulation' (2004) 8 *Journal of Small and Emerging Business Law* 1.

³³⁶ David S Ruder, 'Balancing Investor Protection with Capital Formation Needs after the SEC Chamber of Commerce Case' (2005) 26 *Pace Law Review* 39.

³³⁷ Robert P Bartlett III, 'Going Private but Staying Public: Reexamining the Effect of Sarbanes-Oxley on Firms' Going-Private Decisions' (2009) 76 *The University of Chicago Law Review* 7.

³³⁸ Department for Business Enterprise & Regulatory Reform, *Europe: It's Your Business : The Economic Case* (Department for Business Enterprise & Regulatory Reform 2008).

³³⁹ John Kozup, Elizabeth Howlett and Michael Pagano, 'The Effects of Summary Information on Consumer Perceptions of Mutual Fund Characteristics' (2008) 42 *Journal of Consumer Affairs* 37; Len Driscoll, 'Summary Prospectus May Cause Many to Re-Consider E-Delivery and Consent Strategies' (2009) 10 *Journal of Investment Compliance* 51.

³⁴⁰ Lachlan Burn, 'KISS, but Tell All: Short-Form Disclosure for Retail Investors' (2010) 5 *Capital Markets Law Journal* 141.

³⁴¹ Gaëtane Schaecken Willemaers, *The EU Issuer-Disclosure Regime: Objectives and Proposals for Reform* (Kluwer Law International 2011).

prospectus requirements (potentially with an obligation to include material information, besides merely the traditional industry landscaping and the strategic plan and revenue model of a company).

Lighter “on-ramp” disclosure regimes for SME IPOs are also one of the main aspects of the JOBS Act in the United States. There, the upcoming relaxation of disclosure regimes, through an “on-ramp” disclosure regime, also reduces the ongoing disclosure requirements in the five years after an IPO and also reduces other obligation under accounting standards and Sarbanes Oxley, to name a few.³⁴² In Europe, lighter reporting requirements for SME-issuers should also be complemented with such greater flexibility in ongoing disclosure requirements, like a temporary exemption of quarterly reports under the Transparency Directive. But also other compliance requirement might be adjusted.

Also, the internet and telecom technology now allow to create trust building and information exchange through online deal presentation platforms and tools. This should not necessarily assume that every online promotion is one where investors would lack individual negotiation and due diligence possibilities. Regulations that regulate open calls should thus not necessarily automatically assume that the contracting thereafter would be in an anonymous way. Some basic negotiation and due diligence may be possible, even if a coordination with a large group takes place. Also, investors now have more possibilities to find metrics that may help to judge the value and the honest nature of the offering. For instance, many countries even oblige firms to publish annual accounts, even in case of private companies.³⁴³

But even if the contracting takes place in an anonymous and less individually protected way, we should take into account the fact that investors in internet-marketed campaigns are often approached to buy very small stakes that have no material influence to the wealth of an investor (sometimes with investment stakes in the region of €50, or even less). This already severely limits the risk for a potential investor, even in case the investment loses all of its value. An exemption under the form of a dollar or euro investment cap per person might for instance be more suitable. This might certainly be more appropriate in an internet-era, instead of using safe harbors that are based on numbers of people that may be addressed.³⁴⁴

3.1.3. *The importance of alternative investment objectives*

³⁴² Donald C Langevoort and Robert B Thompson, ‘Publicness in Contemporary Securities Regulation after the JOBS Act’ (2012) 101 Georgetown Law Journal 337.

³⁴³ Some examples: Norwegian Law of 17 July 1998, nr. 56; Belgian Company Code of 7 May 1999. An overview of the publication requirements for annual accounts of companies in the EU can be found at http://ec.europa.eu/youreurope/business/managing-business/keeping-accounts/index_en.htm

³⁴⁴ See for instance this crowdfunding campaign, to lobby for changes to the US securities regulations: <http://www.indiegogo.com/Change-Crowdfunding-Law>

As the internet drastically reduced search costs, it has also offered a platform for specialized groups and communities to find each other. The fragmentation of media that people consume has grown considerable through the internet, as the internet now allows to reach niche audiences.³⁴⁵ Also in the domain of financing, it allows to let investors and investees connect that do not have strict return objectives. However, the promotion regulations that want to protect investors, apply without differentiation. Investors that have more gift-giving objectives³⁴⁶, are however also affected and barred from having a window on the market due to those regulations. Other specific investment preferences that imply an openness to make losses – and that are deprived from getting in touch with opportunities – may be social responsibility³⁴⁷, social utility, solidarity, or other altruistic grounds.³⁴⁸ Recently, experimental studies revealed that altruism is even common with unrelated individuals (and which can thus not be explained by merely kin altruism³⁴⁹, reciprocal altruism³⁵⁰, or long run self-interest).

3.1.4. A market for disclosure rules, better exemptions & SME prospectus?

The multitude of national disclosure regimes for offerings below €5 million is too intimidating and too costly to comply with on a cost-border basis. Also, the disproportionate prospectus requirements are no good fit for small firms that face a growth scenario. This needs to be addressed, either by harmonization or by a market for disclosure regimes where firms can shop for national disclosure regimes that then offer a European passport. Exporting such disclosure regime may then for instance be linked with the condition that investors should expressly declare or accept that they will be subject to the investor protection regime of another state than their home state. In consumer protection law, consumers are now already protected by the state of the seller, instead of the consumer's state. And after *Centros*, the same principle exists for creditors that deal with a company as a company can now choose the member state where it wants to incorporate (and choose the company law) even if the operations take place in another member state.³⁵¹

³⁴⁵ Chris Anderson, *The Long Tail: Why the Future of Business Is Selling Less of More* (Hyperion 2008).

³⁴⁶ See for instance Marcel Mauss, *The Gift: The Form and Reason for Exchange in Archaic Societies* (W W Norton & Company 2000); Bronislaw Malinowski, *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea* (Routledge 1978).

³⁴⁷ Jonas Nilsson, 'Segmenting Socially Responsible Mutual Fund Investors: The Influence of Financial Return and Social Responsibility' (2009) 27 *International Journal of Bank Marketing* 5.

³⁴⁸ See for instance Herbert Gintis and others, 'Explaining Altruistic Behavior in Humans' (2003) 24 *Evolution & Human Behavior* 153.

³⁴⁹ Hamilton (n 43).

³⁵⁰ Trivers (n 65).

³⁵¹ Horatia Mair Watt, 'Choice of Law in Integrated and Interconnected Markets: A Matter of Political Economy' (2002) 9 *Columbia Journal of European Law* 383; Norbert Reich and Axel Halfmeier, 'Consumer Protection in the Global Village: Recent Developments in German and European Union Law' (2001) 106 *Dickinson Law Review* 111.

An often-heard critique is that such regulatory competition might create a race to the bottom and that it would increase the opportunities for fraud.³⁵² However, in case of an offering with a total value of less than €5 million, there are no risks for systematic risks, and minimum layers of protection against abuse and fraud are still present. This is also present under the form of private and criminal liability sanctions in national company laws. It should be more considered as a form of international legal pluralism, than regulatory competition.

It is also for a part a pure balancing choice that exists without any link to any market failures: namely a policy in welfare states to protect ordinary individuals from the most severe risks in society – including the risk to lose all money after a bad investment. As such, besides the market failure reasons, this additional motive should also be considered as positive. However, if there is a clear demand from a group in society (both investors and entrepreneurs) to lift some of these consumer protections, then we should really question government's and financial elite's continuous defend for such mothering approach. Also, the Treaty on the European Union does not provide for a specific basis for investor protection lawmaking, beyond those that are part of addressing market failures. The purpose is after all the creation of an internal market, and to abolish obstacles for the free movements: only within that goal can investor protection laws be dictated. But as the need for barrier-dismantling laws gradually decreased over time, the attention of European policy makers increasingly turned to investor protection issues.³⁵³ They are examples of the allegedly “positive transformative effect” doctrine.³⁵⁴ Perhaps the less sophisticated retail investors are not organized enough to serve as a pressure group to have a voice in the lawmaking process that may relax some of the views.

3.1.5. Startup firms and trade-disabled company units

Company laws also erode the attractiveness or usefulness of public offering exemptions. This comes on top of the fact that the notion of “offer to the public”³⁵⁵ in the Prospectus Directive, does not (and also must not) in every country align with contractual notion of “offer” (an expression of willingness to contract, and which becomes binding as soon as it is accepted). This threefold interpretation gives considerable room for interpretation by national authorities³⁵⁶, as the contractual interpretation can be used for goldplating and as the company law interpretation may

³⁵² Thomas Lee Hazen, ‘Crowdfunding or Fraudfunding - Social Networks and the Securities Laws - Why the Specially Tailored Exemption Must Be Conditioned on Meaningful Disclosure’ (2011) 90 North Carolina Law Review 1735; Claudio M Radaelli, ‘The Puzzle of Regulatory Competition’ (2004) 24 Journal of Public Policy 1; Dale D Murphy, *The Structure of Regulatory Competition: Corporations and Public Policies in a Global Economy* (Oxford University Press 2004).

³⁵³ Niamh Moloney, *How to Protect Investors: Lessons from the EC and the UK* (Cambridge University Press 2010).

³⁵⁴ Willemaers (n 341).

³⁵⁵ Article 2 (1) (d) of the Prospectus Directive

³⁵⁶ Guido Ferrarini and Eddy Wymeersch, *Investor Protection in Europe: Corporate Law Making, the MiFID and Beyond* (Oxford University Press 2006).

render any type of public offer impossible for many companies. Take for instance the situation in France: by default, companies are prohibited from offering shares to the public. As a sanction for violating this rule, every subscription contract will be void.³⁵⁷ Of course, public companies are saved from that rule, but “private” companies aren't. Another example can be taken from the United Kingdom: section 81 of the Companies Act prohibits private limited companies from making public offers (except companies limited by guarantee and without share capital): it can only make offers of its shares if this offer can be seen as a “domestic concern” of the offerer and the receiver.³⁵⁸ Thus, a UK private limited company can only undertake a two step process: first undertaking a financial campaign that does not yet constitute a (contractual) offer but that results in soliciting, and initiating contacts with potential investors, which dealings can result in a “domestic concern”.

A similar problem, besides the misalignment between “offering” notions under securities law and such contract/company types, arises when national company laws impose substantial formalities, in case of equity raises and share issues. This can already start with notarized shareholders resolutions to amend the articles and/or to propose to increase the share capital. Only a few European jurisdictions don't require a notarial intervention for the resolution to augment the capital: for instance the United Kingdom, where the concept of authorized share capital has been abolished, also for private companies, and where the directors may grant rights to subscribe for shares (however, the company's articles may limit this, and may require a resolution of the general meeting).³⁵⁹

Such difficulties are mainly at the level of small startups: such small startups do often have unsuitable company types for open calls and for public fundraisings. They often have private or closely held company types, which lack the state-provided protections to accept anonymous investors who lack due diligence possibilities and who lack individual negotiation power to foresee contractual protections. Therefore, such companies cannot readily sell stakes to investors in the crowd. This will be discussed here.

³⁵⁷ French Civil Code art. 1840, as amended by Order n°2009-80 from 15 January 2009, art. 15.

³⁵⁸ See section 81 Companies Act 1985 : "A private limited company commits an offense if it: offers to the public (whether for cash or otherwise) any shares in or debentures of the company; or allots or agrees to allot (whether for cash or otherwise) any shares in or debentures of the company with a view to all or any of those shares or debentures being offered for sale to the public ..."; And also Companies Act 1985 s742A: "this section does not require an offer to be treated as made to the public if it can properly be regarded, in all the circumstances: as not being calculated to result, directly or indirectly, in the shares or debentures becoming available for subscription or purchase by persons other than those receiving the offer; or as being a domestic concern of the persons receiving and making it".

³⁵⁹ UK Companies Act 2006, section 550. Recommended by The Company Law Review Steering Group, *Modern Company Law For a Competitive Economy The Strategic Framework* (Department of Trade and Industry 1999).

Here, I will illustrate some formalities that exist under company law, and I will particularly use examples of company types that are popular among startups, but that actually forbid to offer to subscribe shares to a third party. The difference between the two company types can already begin at the moment of deciding to accept new investors. Many companies may require a notarized shareholders resolution to amend the articles and/or to propose to increase the share capital. This doesn't create any particular problem at first sight, even not in cases where shareholders are already relatively geographically spread, where they don't necessarily know each other, and where they don't necessarily have the opportunity to be present in qualifying numbers during a general meeting. After all, company laws generally contain mechanisms that allow deciding on a capital raise (also in case of private companies), even if a qualifying percentage of shareholders can't attend during a first meeting.³⁶⁰ However, it can cause a problem because such mechanisms are not always offered to closely held companies: Spanish SRL's (*Sociedad de Responsabilidad Limitada*) require the agreement of half of the shareholders during a general meeting³⁶¹, and can for instance not benefit from the system that is offered to public companies (SA – *Sociedad Anonima*), where a second meeting can decide if only 25 percent of voting capital is present or if two thirds of the share capital present or represented at the meeting agree³⁶². Or take for instance French SARL's (*Société à Responsabilité Limitée*), where resolutions of an ordinary general meeting require a majority of more than 50 per cent of the share capital (although postal votes are allowed, except for approving the annual accounts).³⁶³ Barring the use of such mechanisms is certainly an element that will limit the attractiveness of working with cross-border stakeholders, because a firm takes the risk of not being able to meet qualifying majorities any more during a future general meeting, if more and more shareholders will be spread via the internet. One opinion might however be that a company where more than half of the shares are already spread over disperse group of shareholders, should better fit in a public company regime that offers standard protections to shareholders. However, another opinion might be that the dichotomy between public and private firms may be questioned, and a single model that applies to both public and private (or closely held) firms might be more suitable.³⁶⁴ Today, the notion of being public is certainly not aligned anymore with the notion of being listed. Another opinion, which is also discussed in the next part of this study, may also be to offer the flexibility to the companies themselves to actually design the company structure that they want and to offer them the possibility to include protections (either after negotiations, in case of shareholders that had negotiation power, or self-imposed to attract anonymous investors). Or, there should be some element of proportionality, or some on-ramp mechanism that gradually adjusts the compliance burden and costs, depending on the degree of public market capitalization.

³⁶⁰ For instance: French Commercial Code, art. L223-30, as amended by Law No. 2005-882 of 2 August 2005; Belgian Companies Code art. 286; etc.

³⁶¹ Spanish Corporate Enterprises Act, art.199

³⁶² Spanish Corporate Enterprises Act, art. 201

³⁶³ Christian Campbell, *Legal Aspects of Doing Business in Europe 2007* (Lulu.com 2007).

³⁶⁴ Robert P Bartlett III, 'Managing Risk on a \$25 Million Bet: Venture Capital, Agency Costs, and the False Dichotomy of the Corporation' (2006) *bepress Legal Series 1339* <<http://law.bepress.com/expresso/eps/1339>>.

A categorization between open and closed company types may be better³⁶⁵, whereby the open types can promote units to the crowd – initially by self-offering protective terms and by gradually having to comply with state-provided securities rules the more capital intensive they become and the more dispersed the shareholding becomes. These then become an optional third category, like listed companies today.

But besides difficulties on the level of the resolution to raise the capital, some company laws also require notarized subscription statements. This is for instance the case in Germany, for a GmbH.³⁶⁶ These are the most prohibitive situations, especially in case of internet-based fundraising where an investor may even reside in another country. In theory, some sort of subscription promise may be agreed on through the internet, but it will still only have the meaning of a Memorandum of Understanding or a precontract (or a contract to contract). But ultimately, the investor must meet with the rest at a notary, or he/she must provide a notarized power of attorney. In a cross-border transaction, a foreign notarized power of attorney is only in a very limited cases directly recognized by the country of the investee (depending of the notarial laws of that country, and the treaties in place), but in most cases it requires a visit to the embassy of the country of the investee (in case the embassy offers notarial services), or alternatively, it needs to undergo a super-legalization process, by obtaining an apostille.³⁶⁷ In a world where dematerialized securities and electronic bank transfers are the norm, this is certainly also a bottleneck and a situation where lawmaking lags behind business life and technical possibilities. And it might effectively have the effect of keeping potential investors without a pre-existing substantial relationship and a geographical closeness away.

Avoiding the notarized subscription requirement can obviously be solved by transforming the company into a public company first (not to be confused with a listed company, but rather to be considered as a “corporation” entity type), but this is actually a catch-22 situation: it are mostly the very kind of companies for who it is financially difficult to use a public company type, that are raising funds.

Ultimately, a capital raise also requires in many cases a resolution or notification evidencing the execution of the capital raise. This does generally not require any intervention of the new investor. This is for instance the case in Italy, even for private companies: a full subscription is only subject to a declaration to the Register of Enterprises (which does not require action from the subscriber).³⁶⁸ Another example is Belgium: a second notarial deed is necessary for the execution of the capital raise, but this does not require any action from the new investor, not even in private companies.³⁶⁹ However, there may still exist situations where the governing company law requires a resolution of the existing shareholders, to vote on accepting a particular

³⁶⁵ Jaap Winter and European Commission High-Level Group of Company Law Experts, *Report of the High Level Group of Company Law Experts on a Modern Regulatory Framework for Company Law in Europe* (European Commission 2002).

³⁶⁶ German private limited liability companies act, para. 55.

³⁶⁷ Michael Johannes Oltmanns, *European Company Structures: A Guide to Establishing a Business Entity in a European Country* (Kluwer Law International 1998).

³⁶⁸ Italian Civil Code, art. 2481 bis.

³⁶⁹ Belgian Companies Code, art. 308.

new shareholder. This cannot be done upfront, at the time of the decision to raise the capital, because it is not yet known who that new shareholder will be... Eventually one would be able to use a mechanism with a conditional subscription possibility to attract potential investors, and these investors will ultimately have to undergo the discretionary acceptance of the existing shareholders. But for potential investors, it is vastly less attractive. Also, for investors that have been attracted through the internet, it might not necessarily be feasible to meet the potential investor in person, which might reduce the ability to assess the fitness of the new investor.

In general, shareholders that physically meet should no longer be essential as comprehensive electronic processes allow communicating information and decision-making at a distance.³⁷⁰ Shareholder meetings are nothing more than a coordination mechanism to overcome the high cost of accumulated individual transaction costs. Information technology is an excellent manner to help reducing such coordination costs, while this previously required meeting in one single physical space.

3.2. The struggles of conductive infrastructure

Operators of internet platforms that facilitate open calls, and that potentially also offer some means to create investor-investee relationships or that even offer online (standard) contracting, face their own set of problems. They face the risk of being treated as intermediaries rather than infrastructure providers. Consequently, they cannot necessarily cope with the cross-border uncertainty or with the existing regulations then. Those existing regulations haven't been designed with such direct access internet infrastructure in mind. Still, such market infrastructure is developing, and this happens even completely parallel and disconnected from the traditional market infrastructure like exchanges.

But before the arrival of the internet, the computer was already responsible for a first wave of regulatory and ecosystem pressure, and consequent regulatory changes. Mutual exchanges and brokers faced competition from electronic systems. Brokers started to compete by offering a more direct and faster access channel for their clients to such exchanges –coined direct market access– resulting in competition based on price instead of differentiating by offering complementary value added services like research for growth firms. On the level of exchanges, competition came from market entrants that operated fully automated matching systems. These could be used for trading stocks that were listed on regular exchanges or not. They could even offer trading for stocks that were listed at multiple exchanges, thereby offering substantial economies instead of requiring being a member at all different exchanges individually (consider for that the situation in Europe, with the fragmented landscape). Order and quote input (and even matching) could also be performed through computers, in a much faster and more mass-oriented way, and allowed to extend the “floor” to everyone with a “screen” that was connected to the computer infrastructure. Such platforms could operate pan-European and could theoretically also compete for listings. These innovations conflicted with regulations that entrenched the national monopolies. Many countries had concentration rules that required all trades to pass through the national

³⁷⁰ Winter and Experts (n 195).

exchange. This would however gradually be liberalized. This led to a landgrab of different venues that tried to obtain a part of the listing and trading market. To be able to compete, existing venues would react and would become for-profit institutions instead of mutual organizations between brokers.

However, unlike the circumstances and the opportunities that the internet brings today, these early computerized infrastructures still required access through intermediaries. Those intermediaries performed a quasi-coordination function in a fragmented landscape. But these intermediaries completely focused on anonymous trading activity and not on fundraising or primary open capital calls. Intermediaries would also focus more on the profitable activity of the trade around standardized instruments, rather than specialized services. Effectively, brokers that previously helped to finance growth firms would withdraw from the market³⁷¹, and brokers would more become technology and access providers for trading and post-trading infrastructure. Also the investors would start an arms race and focus on high frequency trading and algorithmic trading, rather than long term investing.³⁷² The social network between non-anonymous parties (investors and firms) would largely disappear. And at the same time, the competition between the computerized venues didn't really create any pan-European market that would be accessible for SMEs. Also a market for listings has never really emerged, just like a market for disclosure regimes also did not emerge (see previous title). Still, the new exchanges did create a source of capital for some firms with difficult and unfavorable access to capital: some 3500 companies were listed on those new initiatives between 1996 and 2006, and about \$100 billion was raised on these exchanges in that timeframe.³⁷³ But overall, many of those initiatives failed, and liquidity was too fragmented. The number of IPOs has indeed been dramatically low during the past years. To illustrate it with numbers: in the US, there were 10115 IPOs between 1987 and 1999; and in Germany there were 407 IPOs in the same period: when adjusted for size differences, the difference is still a multiple.³⁷⁴ In Europe, the UK and France the only countries that come close to the US in terms of IPOs.³⁷⁵ The lack of this exit/IPO route is also one of the main reasons that too little venture capital is raised in Europe. A need for an exit venue was a reason that many of the early initiatives and ideas to create a pan-European exchange for SME's, were supported by the venture capital industry: since they make their profit when they divest their stake in a company, it was crucial to have the type of stock exchanges for small companies in order to expand their investment business.³⁷⁶ In fact, the creation and support of secondary markets is a collective action problem between primary financiers like venture

³⁷¹ Interviews with venture capitalists and specialized service providers

³⁷² Automated trading certainly also created an event that would lead to regulations that influence this domain: in 1987, there was the sharpest drop ever recorded, as computers were programmed to automatically sell shares if a certain drop in price would be observed. Circuit breakers processes were introduced since then, to counteract against too sharp price drops. See for instance Kendall Kim, *Electronic and Algorithmic Trading Technology: The Complete Guide* (Academic Press 2010).

³⁷³ Elliot Posner, *The Origins of Europe's New Stock Markets* (Harvard University Press 2009).

³⁷⁴ Jason Draho, *The IPO Decision: Why and How Companies Go Public* (Edward Elgar Publishing 2004).

³⁷⁵ Jay R Ritter, 'Differences between European and American IPO Markets' (2003) 9 *European Financial Management* 421.

³⁷⁶ Black and Gilson (n 190).

capitalists, to collectively solve their capital risk (namely the risk of not being able to find follow on capital for portfolio companies, or to find channels to divest investments).

The computerized infrastructure from existing exchanges did not only default to secondary trading, it also attracted an investor type with a particular set of homogenous properties. Investors compete between each other and are not aligned with the issuers, thereby creating negative externalities for firms (as third parties). Traders compete between each other in a zero sum game, and do expect positive input from the firms, as third parties, but do not necessarily have to bear the full costs of their scrutiny and trading and pricing behavior among their trading peers. Indeed, price-setting and nervousness among traders may have negative effects to the issuers, who are reduced to merely third parties. Investing is today more associated with “stock picking” in liquid markets where money changes hands between investors for trade in “old” shares. As a result, many firms even start to fear the public scrutiny that public trading brings. Or in fact: to protect against the adverse effects of being listed, some firms may even prefer to remain private. Still issuers were dependent on these monopolistic market actors, and had no alternative infrastructure available.

Regulations did also change and adapt under the pressure of such computerized systems, but it did only entrench the market focus on secondary trading. Today, the internet-based platforms for primary offerings do again create a level of pressure on the regulations – but such direct access platforms are most of all hindered by the regulations and by the market structure that existed until now. This hinders the emergence of conductive infrastructure that leverages the possibilities of the internet and that can help firms to raise capital.

3.2.1. A first demand for regulatory changes, coming from electronification: the breakdown of listing and trading monopolies

In the 1970s, the Toronto Stock Exchange and NASDAQ became the first exchanges to create an electronic matching system for inserted quotes from brokerage houses (without an auctioneer that set the price or without the need for a broker in a physical meeting place). For NASDAQ, quote input was initially still done over the phone before it moved to an automatic matching system 6 years later, and the Toronto stock exchange only used the automatic limit order book for inactive stocks. The Canadian system would serve as a model, for instance for the fully automated system that the Tokyo Stock Exchange would implement in 1982, but also for many other exchanges – often indirectly, and the exact same system was also licensed to the Brussels Bourse, the Paris Bourse and the Madrid Bourse as well as three other stock exchanges in Spain, to name a few.³⁷⁷ Many traditional exchanges also implemented a parallel limit order system. Also NASDAQ would serve as a role model for many other exchanges.

The automated quoting mechanism was egalitarian and transparent in nature, in contrast to non-anonymous floor based systems where the counterparty could still be

³⁷⁷ Larry Harris, *Regulated Exchanges: Dynamic Agents of Economic Growth: Dynamic Agents of Economic Growth* (Oxford University Press, USA 2010).

selected or seen. But in case of a primary offering, it does not prevent that the underwriting can still be organized in such a way that buyers or sellers may be favored for stock allocation if no laws prevent this (then at the expense of equal treatment between potential investors).³⁷⁸ The egalitarian nature makes it also limitless in terms of the members that can connect.

The NASDAQ system of mounting buy and sell price quotes, was however still an intermediated system, instead of a direct access system. It connected market makers and brokerage houses that could take up an obligation to provide permanent quote input (thus guaranteeing permanent liquidity as there is no negotiation possibility like in non-anonymous open outcry markets).³⁷⁹ They were however allowed to put the spread high but there is nonetheless permanent liquidity, and permanent competition between market makers (if they set spreads too high, their quotes will not be matched and they will not be able to enter the trades that will allow speculative income to deal to its clients or on the exchange, or to exit from those trades – possibly resulting in unsold inventory). Also, in return of such obligations, market makers enjoy advantages that are offered by the stock exchanges. For instance: they can do naked selling (taking a short position without having to lend shares). With such “dealer markets”, investors had to deal with one of those connected market makers or brokers. Other platforms with automatic matching systems would not necessarily have this liquidity requirement.

Similar electronic matching technology was also applied in the domain of off-exchange trading systems, both in the United States, as in Europe. In many cases, such systems would not act as an arbiter for admitting securities to its platform (unlike the example of NASDAQ above), but purely offer trading facilities for stocks that were listed on other venues. These systems to reduce trading costs often emerged as user-owned institutions, just like listing venues (exchanges). This user-owned nature also allowed that they don't necessarily have to strive for profits, as the cost saving may have more value to their user-owners than income from matched trades.

The creation of such alternative trading and listing venues could of course create fragmentation, if buy and sell interests were not centralized anymore. In fact, many European countries did not allow such new platforms, and still required to channel all activity to the recognized national exchange.

The fragmentation between electronic trading and listing venues can theoretically be solved through interconnection, to offset unmatched trades. It is a form of coordination that can take place through standardization of the interfaces. But as long as there is no obligation to do that, it depends on voluntary interconnection. In case of the NASDAQ platform for instance, trading platform operators can connect to NASDAQ to mount unmatched trades from their own platform. Their acceptance was a result of the

³⁷⁸ For investor favoritism at stock allocation, although in an IPO setting here, see for instance: Ely R Levy, 'Law and Economics of IPO Favoritism and Regulatory Spin, The' (2003) 33 Southwestern University Law Review 185.

³⁷⁹ See for instance the NASDAQ marketplace rules / listing rules 4000 series, under n°4600: Requirements for Nasdaq Market Makers and Other Nasdaq Market Center Participants. Available at http://nasdaq.cchwallstreet.com/NASDAQ/pdf/new_listing_rules.pdf

breakdown of a cartel that had formed among initial market makers. Market makers that competed on smaller spreads to get their quotes filled fast enough in order not to have to much risk on their own books, and also to make a profit from the trading activity, also created an incentive to mutualize again (just like happened at the origin of traditional exchanges), and to form a cartel to prevent too much profit erosion if spreads would become too narrow under such competitive setting. From a theoretical or academic point of view, the size of the spread actually depends on three things: the degree of asymmetric information between the dealer and informed traders³⁸⁰, inventory costs³⁸¹ and the remuneration for the service of providing immediacy³⁸². This cartel formation to protect the spread (and the profit erosion, or at least the size of the risk that liquidity requirements could bring for market maker's own positions) was not in the best interest of end investors. William Christie and Paul Schultz, two academics, had discovered that NASDAQ market makers colluded on bid-ask spread, through data mining that discovered bid-ask spreads as minimum 25 cents.³⁸³ Accepting lower differences than this is also not good as it results in the practice of "running ahead" by only an insignificant small difference to get the trade (today, a regulation under the name regNMS dictates a minimum difference between quotes to prevent this practice from happening). Part of the settlement was that NASDAQ agreed to new order-handling rules. Another part was the agreement to integrate trading venues- into the "quote montage system" of NASDAQ.

But the situation in Europe did initially exclude any risk for additional fragmentation as national markets held monopolies. In Europe, a "concentration rule" and a "default/exclusivity rule" existed in some European countries. For instance, Germany required banks and brokers to execute (concentrate) orders on an exchange unless an investor opts out on a per order basis.³⁸⁴

There was however the need and the desire to create pan-European exchanges. The possibility for electronic computer terminals now facilitated to idea to not only have competing listing venues in a particular national market, but also to operate on a pan-European basis. The London Stock exchange saw for instance a huge opportunity in the pan-European possibilities that screen based trading could bring as traders in virtually every corner of Europe could be connected given the advances in telecommunication

³⁸⁰ Lawrence R Glosten and Paul R Milgrom, 'Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders' (1985) 14 *Journal of financial economics* 71.

³⁸¹ Thomas Ho and Hans R Stoll, 'Optimal Dealer Pricing under Transactions and Return Uncertainty' (1981) 9 *Journal of Financial economics* 47.

³⁸² Harold Demsetz, 'The Cost of Transacting' (1968) 82 *The Quarterly Journal of Economics* 33.

³⁸³ William G Christie and Paul H Schultz, 'Why Do NASDAQ Market Makers Avoid Odd-Eighth Quotes?' (1994) 49 *The Journal of Finance* 1813.

³⁸⁴ BörsG (2002), §22 (1); Peter Gomber and others, 'Regulation and Technology in Equity Trading—The Impact of Regulatory and Technological Changes on Order Execution and the Trading Venue Landscape in Europe' in Peter-Jan Engelen and Karel Lannoo (eds), *Facing New Regulatory Frameworks in Securities Trading in Europe* (Intersentia 2009).

technology. In the second half of the 1980s, the London Stock Exchange created SEAQ to attract professional cross-border trades, and thus wanted to compete with national exchanges.³⁸⁵ It used a screen-based quote-driven system, and the matching “venue” could thus be accessed from screens outside the UK as well. The London Stock Exchange would be one of the first, but certainly not the last of the existing exchanges that would also become on the demand side for regulations that made it possible to place screens in other jurisdictions as well and thus to abolish some national monopolistic situations.

European exchanges and financial actors very much defended their system around local (national) markets, with national interests (from government, treasury, national financial elite, etc.), to protect the competitive position of the national financial industry (including the privileged stock exchange). Many exchanges were also organized as member-owned exchanges. In many cases, members owned exchanges look mainly after the interests of the members. Such exchanges usually had very few listings, and thus limited network externalities, and it implied that usually only the most established companies with solid market positions (i.e. utilities in a monopolistic position, companies with strong brand loyalty, etc.) had a listing. The national scale thus actually implied a fragmentation on the European level. Also, the threshold to obtain a listing was seriously high, and IPOs were rare. For instance, the median age of a company that went for an IPO in the US between 1980 and 2000, was just seven years.³⁸⁶ Indeed, that's still in the early growth phase of a business, and it is a huge contrast to Europe where the average age has been reported to be 40.³⁸⁷ A difference is that these mature issuers usually don't go public to raise capital for their growth, but for other reasons (mainly to provide an exit route for existing investors).

The idea to give stock markets a geographically wider member base, could also allow specialization. For instance: in small and untested companies, like the NASDAQ example. This idea was somehow unseen in Europe. Still, recognizing this untapped market would collide with the desire to create electronic pan-European venues.

Regulatory acceptance came with the end of national monopolies through abolishing concentration rules and default rules. The political attempt to reach a single market in the EU welcomed this demand to abolish national monopolies. This started with the liberalization of network industries, although there was no overall plan for this but rather a sector-by-sector approach, starting in the 1980s in different sectors. The EC-1992 White Paper of 1985 does not yet speak about the liberalization of exchange markets.³⁸⁸ The Investment Services Directive only offered a choice to Member States,

³⁸⁵ Peter Clemens Reiss and Ingrid M Werner, *Transaction Costs in Dealer Markets: Evidence from the London Stock Exchange* (National Bureau of Economic Research 1994).

³⁸⁶ Tim Loughran and Jay Ritter, ‘Why Has IPO Underpricing Changed Over Time?’ (2004) 33 *Financial Management*.

³⁸⁷ Kristian Rydqvist and Kenneth Högholm, ‘Going Public in the 1980s: Evidence from Sweden’ (1995) 1 *European Financial Management* 287; Giancarlo Giudici and Peter Roosenboom, ‘Pricing Initial Public Offerings on Europe’s New Stock Markets’ (2004) 10 *Advances in Financial Economics* 25.

³⁸⁸ Commission of the European Communities, ‘Completing the Internal Market’ (1985) COM(85) 310 <http://europa.eu/documents/comm/white_papers/pdf/com1985_0310_f_en.pdf> accessed 11 September 2012.

to abolish concentration rules – not an obligation. Their existence would still remain legal under art 4(3) of the 1993 Investment Services Directive. Initially, liberalization would depend on the goodwill of individual countries. In the UK, the 1986 Financial Services Act designed the notion of "Registered Investment Exchanges" (RIEs)³⁸⁹, and abolished the monopoly of the LSE to quote and trade shares.

Individual countries that would abolish the monopoly of its exchange(s) –like the example of the UK- was however not enough, and some interventions therefore had to come from the European level, in order to abandon the monopolistic system. To start, the Investment Services Directive (ISD, Council Directive 93/22/EEC, now succeeded by the MiFID directive) extended the mutual recognition principle; so licensed financial actors would be able to operate in other European member states without requiring a license in every country besides its home/initial country. After the ISD, the MiFID directive would guarantee liberalizations of both the concentration and default rule. However, for operators of Regulated Markets, such passporting regime was not foreseen. Regulated Markets are the notion under MiFID for the venues that maintained an "official list" in a country. That is a notion that is in use under the Listing Directive, and where admission is not only subject to the venue's rules but also to a decision from a country's competent authority which now had to be a public authority. Shares that have been granted permission from a country's listing authority to list on an official list have the status of being "admitted to trading on a regulated market", a label that is in use in different laws. Nonetheless, competition between such listing venues (which maintained an "official list") in a national market was now accepted, as well as the placing screens on a cross border basis.

But in the MiFID directive, the passporting regime was however explicitly foreseen for Multilateral Trading Facilities (MTFs): off-exchange trading venues rather than listing venues. This is for instance reflected in Art. 31.5 of MiFID: "Member States shall, without further legal or administrative requirement, allow investment firms and market operators operating MTFs from other Member States to provide appropriate arrangements on their territory so as to facilitate access to and use of their systems by remote users or participants established in their territory". But in contrast to the United States, the bulk of the trading venues that emerged under that label, operate as standalone systems and do not act as intermediary system that can feed unmatched bid and ask prices to listing venues that would consolidate quotes. Some examples of MTFs that also trade exchange-traded stocks:

- Chi-X (one of the biggest markets for European stocks – with a 13% market share in 2010 as reported by Thomson Reuters, and with 19% market share in 2011)
- Turquoise, owned by nine investment banks who committed themselves to a liquidity during six months after startup, to attract trades (2.5% market share in 2010 as reported by Thomson Reuters, and 6% in 2011)
- BATS Trading Europe, owned by 10 investment banks and brokers (with a 3.7% market share in 2010 as reported by Thomson Reuters, and 5% in 2011).

Some even used these MTF venue types to create "listing venues". Thus, such venues also act as a securities arbiter to accept Over the Counter (OTC) shares for which

³⁸⁹ Section 36 of the UK Financial Services Act of 1986

issuers apply to be traded on such venues. Technically speaking the notion of listing cannot be used for such venues, as they do not maintain an official list and as the listing has not been accepted by the designated national authority. The simple fact of being admitted to trade the shares on such system does also not trigger a prospectus requirement -unlike being listed on a traditional stock exchange- under the laws that implement the Prospectus Directive. The Prospectus Directive, and the laws that implement the directive, only require a prospectus when there is a public offer or when the securities get listed on a regulated market (but MTFs are not Regulated Markets). This may therefore be a substantial saving for companies, and a sales argument for MTFs. Stocks that only trade through an alternative trading venue, and not on a traditional exchange (i.e. a Regulated Market in Europe), can thus benefit from a more liberal regulatory setting. For instance, the Market Abuse Directive and the Takeover Directive only apply to shares traded on a regulated market and not to shares traded on an MTF.³⁹⁰

MiFID foresees that MTFs can be operated by a Market Operator, as well as by an Investment Firm. In the United States, such off-exchange trading venues are called Electronic Communication Networks (ECNs), and in December 1998, the SEC determined that such ECNs could also register as broker-dealers or as exchanges.³⁹¹ In case of exchanges, they would be self-regulatory agencies (SROs). The choice also involved a trade-off between some advantages and disadvantages: the ongoing obligations for self-regulation were costlier, but as an exchange it was possible to connect to the quote montage system of NASDAQ and to connect to the Intermarket Trading System (ITS) which is a form of state-provided standardization to coordinate between the fragmented venues and that will be discussed further. In April 1999, the United States also adopted the Regulation ATS (Alternative Trading Systems), creating an intermediate market participant category, positioned between the broker-dealers and the full-fledged exchanges. ECNs and ATSS are not the same. ATSS are broader, as it encompasses alternative trading venues that operate both continuous auction markets, as well as batch auction markets. In contrast, Electronic Communication Networks only relates to the continuous auction markets with a proper price discovery mechanism. The other group within ATSS, namely the batch auction markets with no proper price discovery mechanism are then called "crossing networks". Such trading venues can indeed be classified according to a number of variables: continuous versus periodic trading, dealer's presence, transparent versus opaque, etc.³⁹² Similarly to electronic exchanges that may be organized as an order-driven market, such ECNs/MTFs/ATSS have mostly matching systems for limit order books. But besides cost-savings however,

³⁹⁰ See Article 1(4) of Directive 2003/6/EC on insider dealing and market manipulation (market abuse) (OJ 2003 L 96/16); and Article 1(1) of Directive 2004/25/EC on takeover bids (OJ 2009 L 142/12)

³⁹¹ Eric Benhamou and Thomas Serval, 'On the Competition between ECNs, Stock Markets and Market Makers' in Kurt Bauknecht, Sanjay Kumar Madria and Günther Pernul (eds), *Electronic Commerce and Web Technologies* (Springer 2000).

³⁹² Hans Degryse, Mark Van Achter and Gunther Wuyts, 'Dark Liquidity Pools: Issues in Competition, Design and Regulation of Crossing Networks' in Karel Lannoo and Peter-Jan Engelen (eds), *Facing New Regulatory Frameworks in Securities Trading in Europe* (Intersentia 2009); Bruno Biais, Larry Glosten and Chester Spatt, 'Market Microstructure: A Survey of Microfoundations, Empirical Results, and Policy Implications' (2005) 8 *Journal of Financial Markets* 217.

ECNs/MTFs/ATSS may offer anonymity (i.e. if a large order comes in). ECNs/MTFs/ATSS have different policies regarding information on their order book. Sometimes, only subscribers can see the entire order book, while others (Archipelago for instance) display their order book on the internet.

Outside Europe, there are still countries where such concentration and default rules are still present. This is for instance the case in China. There operate two state-owned stock exchanges in China (Shanghai and Shenzhen). Besides these venues, market making or reselling or secondary trading by privately operated institutions is forbidden.

Theoretically, new entrants and more fragmentation could emerge in the European landscape. But there continued to be de facto national monopolies however, as it was a formidable task to create an exchange from scratch. Also, for instance in the UK, there were other factors that would still effectively offer some exclusivity over listings to the existing national exchange. Namely, the LSE was awarded the authority to be the competent listing authority, and thus the institute that would decide if a company could be granted a listing or not. Such a competent listing authority was required under the EEC Admissions and Listing Particulars Directive (80/390/EEC), but the Directive leaves the choice of having a public institution (a securities regulator) or a private institution (i.e. a stock exchange). It is in strong contrast to some other European countries, where securities regulators became the competent listing authorities. The latter excludes the risk for anticompetitive behavior by denying a listing at a competing venue. Later, in the spring of 2000, this authority would also migrate from the LSE to the UK securities regulator.³⁹³

New entrants thus faced a difficult situation. Also existing exchanges started to compete more heavily. In general, the increased competition would be accompanied by changes in the governance structure of stock exchanges, from mutual to for-profit organizations, due to competitive forces that emerged in the market. These traditional exchanges mainly became for-profit institutions that would also raise capital and undertake competing initiatives. The trend was first evident in the smaller exchanges, and has later been extended to the larger ones. A list of such exchanges that went through that process of demutualization:³⁹⁴

- OMX Group (founded 1985; demutualized 1987)
- Borsa Italiana (1997; demutualized 1997)
- Amsterdam Stock Exchange (founded 1602; demutualized 1997)
- London Stock Exchange (founded 1801; demutualized 2000)
- Euronext Stock Exchange (founded 2000; demutualized 2000)
- Deutsche Börse (founded 1993; demutualized 2000)
- Oslo Stock Exchange (founded 1819; demutualized 2001)
- BME Spanish Exchanges (founded 1995; demutualized 2001)
- SWX Swiss Exchange (founded 1993; demutualized 2002)

Existing exchanges competed by starting “lite” exchanges, under the form of entry segments, to compete with the new listing venues in Europe. These step-up mechanisms inherently continued the fragmentation problem because they still often

³⁹³ Andrew Rosling and Theodore Goddard, ‘FSA Takes Over LSE Responsibility as UK Listing Authority’ (2000) 19 *International Financial Law Review* 13.

³⁹⁴ Posner, *The Origins of Europe’s New Stock Markets* (n 373).

focused on national markets, and the national markets didn't really have an incentive to promote these "second class" exchanges. But creating different national "second class" exchanges - each with their different information standards, did not only hinder the creation of one single market with a choice of different listing standards. It is also not really attractive for investors that wanted to be able to compare different companies, or that wanted to assess the risk of investing in the company. Having to understand and adapt to different information standards, is time-consuming and thus costly for investors. Perhaps, lowering the information standards might have been an ad-hoc solution to attract more companies to the exchange, but investors really ask for widely accepted information standards.³⁹⁵ Examples of such "junior" segment markets, and their listing requirements:³⁹⁶

- The Nouveau Marché in France, which required a €1.5m equity base prior to listing and had no requirements on history of company accounts. The minimum float was 20% of the shares, with a minimum of 100,000 shares and a minimum of €5m. The latter two are in contrast to the normal listing requirements with a history of 3 years of company accounts, and a requirement to float a minimum of 25% of the shares. Also, the Nouveau Marché didn't impose to use English, and it allowed a choice between French GAAP, IAS or US GAAP when it came to information disclosures (the regular market requires IFRS now).
- The Neuer Markt in Germany, which also required €1.5m equity base prior to listing, a history of 3 years of company accounts (although with some flexibility) and a requirement to float at least 20% in a minimum of 100,000 shares with a minimum of €5m. Compare this with the regular requirements of €750,000 equity, a history of 3 years of company accounts, and a required free float of at least 10,000 shares. The Neuer Markt did however impose the use of English, and the use of international disclosure standards, just like the regular market.

London's Alternative Investment Market (AIM) was the most successful survivor of the intense competitive forces between the different new listing venues for small companies that existed in the 90's. It was not a NASDAQ clone at all as the information standards towards investors were much more inferior.³⁹⁷ Or at least, it implied a less costly compliance model.³⁹⁸ For instance, instead of a prospectus, the company must produce a less comprehensive admission document in relation to its application for admission to trading on AIM in accordance with the AIM Rules. A property of exchanges that have been inspired by the AIM, is the exemption from many investor protection rules.³⁹⁹ It has however an introduction mechanism for potential companies, which relies on network-based reputation. Firms that are approved by the exchange to bring companies to the market but which would suffer reputation damage if they would bring

³⁹⁵ See for instance; Alan G Ahearne, William L Grier and Francis E Warnock, 'Information Costs and Home Bias: An Analysis of US Holdings of Foreign Equities' (2004) 62 *Journal of International Economics* 313.

³⁹⁶ Posner, *The Origins of Europe's New Stock Markets* (n 373).

³⁹⁷ 'Editorial Comment: Taking Aim for Global Success' *Financial Times* (6 October 2004) <<http://www.ft.com/intl/cms/s/0/59a06a02-1734-11d9-bbe8-00000e2511c8.html#axzz32YbKoC7b>> accessed 23 March 2013.

³⁹⁸ Jose Miguel Mendoza, 'Securities Regulation in Low-Tier Listing Venues: The Rise of the Alternative Investment Market' (2008) 13 *Fordham Journal of Corporate & Financial Law* 257.

³⁹⁹ Silvio Vismara, Stefano Paleari and Jay R Ritter, 'Europe's Second Markets for Small Companies' (2012) 18 *European Financial Management* 352.

non-performing companies to the market. Most European initiatives would not survive the competition and the dotcom bubble, but small company exchanges that would thereafter emerge in Europe, would therefore start to adopt this successful AIM model. Euronext's Alternext and Entry Standard from the Deutsche Boerse replicate some AIM aspects.

The AIM started with a first mover advantage, like the other lite and feeder exchanges or segments that were started by existing exchanges: it could benefit from its connection with the London Stock Exchange. It already started with a base of existing members, and it also had the legal authority, technical infrastructure and regulatory apparatus it could rely on from the London Stock Exchange. The London Stock Exchange even transferred some stocks to that AIM after its creation. The AIM format certainly also has its roots in the long history of the London Stock Exchange of two tiered markets, with the official market/list on one hand, and a junior, less regulated market at the other had. The London Stock Exchange had a laissez faire attitude for a long time, and it was for a long time not concerned with the quality of the securities that were trade in the market.⁴⁰⁰ Already in 1889, it was observed by Gibson, that the Committee would decline “to admit to quotations the questionable enterprises of ‘shady’ promoters” but would not “indicate any opinion, personal or official, as to the value of such issues, or their real genuineness or soundness. That is entirely beyond their province, and persons buying issues that have been ‘listed’ should scrutinize the property and investigate the value for themselves. Caveat emptor.”⁴⁰¹ Also in the early 20th century, companies would have a choice not to fall under the typical requirements for an LSE quotation, but to still be able to have their company’s stock traded on the exchange. Therefore, they had to apply for a “Special Settlement”.⁴⁰² Stocks would then not be listed on the Official List, but on regular dates -“Special Settlement Dates”- such stocks would be introduced all at once and from then on the would become part of the normal account system but the distribution of pricing data of such stocks would only happen from 1916 onwards. It was in fact an early junior market, within the therefore two-tiered stock exchange, and companies would be able to “on-ramp” to the Official List. Among the 196 companies that carried out Special Settlement IPOs between 1909 and 1913 that by 1916 had not been acquired, liquidated for value, or gone bankrupt, 32 had graduated to the Official List of the LSE.⁴⁰³ This “Special Settlement” option could also be chosen if their application for the regular quotation had failed. The LSE Committee would not entertain an application for Special Settlement unless there were transactions to be settled and it had the power to keep off the market the shares of companies where undesirable practices had occurred. Special Settlement IPOs were commonplace and were thus almost entirely unregulated. Such circumvention of the more regular rules, would also be an aspect of the later AIM exchange.

The regulatory changes that followed the pressure of electronification, thus resulted in a higher attention for trading instead of fundraising. The resulting infrastructure does perform poorly in acting as a conductive platform for firms that want to search for investors, or for the actual fundraisings. The same poor performance is true for the

⁴⁰⁰ Burhop, Chambers and Cheffins (n 205).

⁴⁰¹ George Rutledge Gibson, *The Stock Exchanges of London, Paris, and New York: A Comparison* (GP Putnam 1889).

⁴⁰² Burhop, Chambers and Cheffins (n 205).

⁴⁰³ Ibid.

regulations. Another result is the increased level of fragmentation among both listing and trading venues. This can theoretically be solved through standard interfaces that allow some form of coordination between different venues and to allow one central entry point. Also, I already highlighted that the new breed of listing venues like NASDAQ and AIM still maintained a structure that requires intermediaries. The role of intermediaries would become even more entrenched, as regulations in Europe would use intermediaries for a coordinating function in that fragmented landscape. In the United States, an interlinking system would coordinate in a fragmented landscape. This will be discussed next.

3.2.2. Entrenchment of intermediaries: pre-trade liquidity consolidators and post-trade infrastructure members

Intermediaries are today more technology providers that offer access and routing between clients and venues and post-trade infrastructure. Brokers may be inclined to direct the business to a venue that is most beneficial for them but not necessarily for their client. Regulations created strict rules to prevent this. With a landscape of fragmentation of liquidity among different competing venues, it is worth considering how rulemakers or markets themselves have adopted rule to prevent this from having any adverse effect on the end investors.

In Europe, brokers are bound to the best execution rule. The best executions obligation that brokers have, does only apply to the different venues where a particular broker executes its clients orders. It must only include those venues that enable them to obtain on a consistent basis the best possible result for the execution of the client orders.

In the United States, a system is in use that consolidates the liquidity information from the different platforms. It is a form of coordination to create one central access point in an otherwise fragmented landscape. The SEC adopted Regulation NMS (National Market System) in December 1998 (that came into effect on April 16, 1999). There is however no European counterpart.⁴⁰⁴ Nonetheless, in Europe post-trade information must be published: including the time of execution, the execution price, and the associated trading volume. However, despite this theoretical access and publication, this comes at a cost to obtain the datafeeds and therefore, price transparency is costly. It is also not working for order consolidation. Therefore, in the United States there is also an order routing system in place since 1981 that even applies to trading venues, and that potentially obliges them to transfer orders to another venue if that would be in the interest of the client (the trade through rule, now changed to the order protection rule, which depends on the access rule).⁴⁰⁵ This does however not apply to (nonelectronic) “slow markets”. In Europe, a trading venue is not obliged to connect with a listing venue to offset unmatched trades in order to create one liquidity pool.

⁴⁰⁴ Andreas Storkenmaier and Martin Wagener, ‘Do We Need a European “National Market System”?’ Competition, Arbitrage, and Suboptimal Executions’ (2011) <<http://papers.ssrn.com/abstract=1760778>> accessed 2 February 2013.

⁴⁰⁵ Giovanni Petrella, ‘MiFID, Reg NMS and Competition across Trading Venues in Europe and the USA’ (2010) 18 Journal of Financial Regulation and Compliance 257.

Given the fact that prices in quote and order driven systems are already available pre-trade, it becomes an obvious question if it should be allowed to keep those secret (in a dark pool), or if exchanges should make to public by law. This is separate from the question if the linkages should be standardized to allow coordination between venues. There is contradicting academic research that both demonstrates positive, as well as the negative impacts of openness⁴⁰⁶, but the MiFID directive in Europe has chosen to require that regulated markets and MTFs make real time interests available to investors.⁴⁰⁷ National authorities could initially waive that requirement.⁴⁰⁸

The whole ecosystem is recognized by a lot of interconnected but different communication systems, that each rely on proprietary protocols:

- Stock exchanges have each their proprietary protocol for order entries (or automated trading)
- Stock exchanges have each their proprietary protocol for quote and price data (stock exchanges consider quotes and prices as their most valuable asset)
- Data vendors / resellers like Reuters and Bloomberg have their proprietary protocols to provide the data

To perform the mechanical venue aggregation and “best execution” guarantee, brokers rely on software. These software systems are described as Automated Order Routing Systems (AORs), or Smart Order Routing Technology (SORT). Brokers have thus moved away from the intermediary role towards an entrenched role of technology providers and access providers that have a consolidation role in fragmented markets. Even despite the internet and the theoretical possibility to directly access the electronic trading system chain, Direct Market Access still passes through the broker’s computer network. Also for the post-trade execution, intermediaries are necessary to effectively access the silos and networks around post-trade infrastructure.

3.2.3. Direct access internet-based platforms for primary & secondary equity trading

While the existing infrastructure, and the regulations that surround it, rather evolved to systems that mainly serve investors and intermediaries, some try to jumpstart internet-

⁴⁰⁶ Ananth Madhavan, David Porter and Daniel Weaver, ‘Should Securities Markets Be Transparent?’ (2005) 8 Journal of Financial Markets 265; Ekkehart Boehmer, Gideon Saar and Lei Yu, ‘Lifting the Veil: An Analysis of Pre-Trade Transparency at the NYSE’ (2005) 60 Journal of Finance 783.

⁴⁰⁷ Article 29, compared to the similar article 44 in case of regulated markets, in combination with article 17 of the “Level 2” implementing regulation

⁴⁰⁸ Article 29, compared to the similar article 44 in case of regulated markets, but article 18 of the “Level 2” implementing regulations foresee some conditions if national regulators want to waive these transparency requirements: they especially apply to crossing systems that “import” prices from other venues or from systems where the trade is privately negotiated before it takes place through the MTF. Iceberg orders or stop orders are also excluded from transparency requirements

based mini-exchanges with a focus that is more on primary trading. If a standard instruments like equity is used, then such platforms would of course be able to use economies of scope and economies of scale to offer both primary and secondary trading. The question is only why we don't see a lot of such platforms arise. The barriers that such direct marketplaces face will be discussed here.

From a purely technical point of view, traditional exchanges do not offer direct internet-based access themselves as they rely on legacy computer systems, instead of web systems, and also as the communication systems are dedicated instead of web-based. Web standards are only used in the communication from exchanges to investors (i.e. web publication of the order book, or of trade information), but not in the direction from the investor to the exchange. End-users thus still go through the services and computer systems of intermediaries who then connect to exchanges and clearing and settlement infrastructure providers via dedicated lines and proprietary protocols.⁴⁰⁹

From a high level abstract point of view, technology merely replaced the telephone lines. However, I have pointed out that brokers have lost their other values in the market, once they moved to competitive online retail brokering: namely their advisory role and matching role. That remaining role, namely the one of a technology provider that offers online direct market access, is actually one that can technically be performed by the exchanges and clearing and settlement providers themselves. Or potentially only the order input can be directed directly to the venues, while the execution still requires a broker or bank given the high capital and trust requirements to participate in clearing and settlement infrastructure.⁴¹⁰

Despite the fact that there is no convincing technical reason to impose the use of intermediaries to access a platform, existing rules find it however still comfortable to assume such intermediary. This also offers a split in responsibilities between the platforms and those intermediaries, which would not be present if users connect directly to such a platform, or at least this responsibility would not completely have to be assumed by the platform. Indeed, intermediation also partly allows easing the regulatory oversight.

In general, regulations like MiFID do not directly envision the combination of both brokerage and platform activities into one entity, or at least it requires multiple licenses that were conceptually not intended to be combined into one entity. Such direct access platform operators may then exercise those MiFID regulated activities that can all be exercised under the license of an Investment Firm:

- ⇒ Placing of financial instruments without a firm commitment basis;
- ⇒ Reception and transmission of orders in relation to one or more financial instrument
- ⇒ Operation of a Multilateral Trading Facility

⁴⁰⁹ Claudiu Vinte, 'The Informatics of the Equity Markets - A Collaborative Approach' (2009) 13 *Informatica Economica* 76.

⁴¹⁰ Ming Fan, Jan Stallaert and Andrew B Whinston, 'The Internet and the Future of Financial Markets' (2000) 43 *Communications of the ACM* 82.

Alternativa is an example of a Swedish-French online platform that is structured as a combination of an exchange and a brokerage firm⁴¹¹. The investors can choose to trade directly on the market or use traditional brokers. Such online systems where investors obtain direct standard equity may be more investor friendly than engineered transactions as offered by equity crowdfunding platforms that will be discussed later.

However, internet-based platforms also often try to operate outside such expensive compliance regimes like MiFID, and they may try to find interpretations that put them apart. To start, uncertainty can arise around the activity of reception and transmission of orders.⁴¹² This is typically an activity that is performed by the intermediary, but not by the platform itself. In case a platform would offer direct access, then there is a risk that some regulators might potentially consider that the situation of going through a confirmation screen and consequently sending confirmation emails to the parties (for communicating that an investor decided to underwrite one or more of the investee's securities) would qualify as accepting and transmitting of orders.

The second regulated activity is that of private placements. Although private placements are not defined in the MiFID directive, it is a relatively common financial activity, and there is a relatively common understanding that this activity whereby investment firms place financial instruments, happens on behalf of the issuer.⁴¹³ Thus, when a platform is merely giving the technical means to an issuer to place its shares with investors, an interpretation may be that this platform should not be considered as acting on behalf of that issuer (instead, the issuer acts on behalf of himself). However, the problem is again the legal uncertainty: there is a risk that national regulators might classify such activity as a placement activity, even if it is performed in an impersonal way through a direct access internet-based platform.

Finally, I highlighted before that the MiFID directive created the notion of Multilateral Trading Facilities (MTFs). The directive defines an MTF in article 4 as a multilateral system, operated by an Investment Firm or a Market Operator, which brings together multiple third-party buying and selling interests in financial instruments -in accordance with non-discretionary rules- in a way that results in a contract. However, internet platforms that mainly serve for primary offerings where one offerer sets the price, and where there is no mechanisms to set the market price, may fall outside this definition. But again, the real risk is situated on the level of potential interpretations. But irrespective of today's regime for MTF's, a MiFID consultation paper clarifies that the

⁴¹¹ <http://www.alternativa.se> and <https://www.alternativa.fr>

⁴¹² In that respect, it should be noted that for the purposes of the Directive, the business of the reception and transmission of orders should also include bringing together two or more investors, thereby bringing about a transaction between those investors. Although this interpretation stems from the recitals (n° 20), whose legally binding capacity might be challenged, it limits the field of operation for crowdfunding platforms (that want to operate in a non-regulated area, or that don't want to face the information requirements towards "clients", or the problems that the inducement rule might create) to primary share emissions, and does not allow to benefit from economies of scope to also offer a secondary market platform.

⁴¹³ See: Questions & Answers on Single Market Legislation: question ID 152 submitted on 07/02/2007: <http://ec.europa.eu/yqol/index.cfm?fuseaction=question.show&questionId=152>; See also UK Financial Services Authority, Perimeter Guidance relating to MIFID (document PS07/5), Answer to question 22.

European lawmaker doesn't necessarily intend to leave all platforms outside the scope of the MiFID: "in order to address evolving market practices and technological developments [...] to regulate all organised trading occurring outside the current range of MiFID venues."...⁴¹⁴ Indeed, the upcoming MiFID II will also regulate "Organized Trading Facilities", which might potentially even include such peer to peer internet-based platforms.

The most problematic part may however not necessarily be the compliance with a license as investment firm, which is certainly doable when the platform is sufficiently financed or when the regulatory cover of a partner can be used. It is however, the fact that MiFID basically entrenches the requirement to use intermediaries instead of being able to open the platform to end investors directly. MTFs, must comply with art. 42.3 of MiFID regarding the admission of members and participants: these which must be fit and proper; have sufficient level of trading ability and competence; have adequate organizational arrangements; and have sufficient resources for the role they perform according to MTF rules established to guarantee the settlement of the transactions. More exactly, in implementing art. 42.3, MTFs often set some criteria regarding prospective members. They must for example be a regulated investment firms or credit institutions, or be able to demonstrate sufficient experience in trading securities (e.g. being member of other trading venues). It is also often required that they have adequate internal control systems, expertise and financial resources. Especially the requirement to have adequate settlement arrangements in place prior to joining the MTF, may be difficult to meet for end investors in case of direct access. Adequate settlement arrangements in reality imply joining clearing and settlement service providers. The central institutions, CSDs, are rarely directly accessible by end investors. They thus require the services of a broker, a bank or a settlement agent. After all, membership requirements to join a clearing and settlement infrastructure provider will normally include heavy capital requirements. Also technical connectivity requirements may be out of reach for end investors.

Some countries that had/have thus effectively a requirement to use an investment services provider to trade on a regulated market or an MTF are for instance Belgium (article 24 of the Law on Financial Supervision) and France (article L. 421-6 of the M&FC). Such requirements to use an intermediary may also exist in the case of primary offerings, like in the Belgian Law of 22 April 2003. Primary offering are typically performed with bookbuilders that engage one or more underwriters: that are banks that buy the shares that need to be offered to the public, and that resell them to the public with a small markup (for instance 5%). Those bookbuilders will typically impose the requirement that the minimum required amount of money has at least been committed – which is only available to institutions or very rich individuals but which cannot be met by normal end investors. The incentive to use bookbuilders instead of offering equity directly to end-investors, is obviously profit maximization. This service mainly exist due to information problems: investors know very little about a company before it becomes public, and the company doesn't know how interested the investors will be to buy shares. Investment banks step in in this gap and advice how the sale should occur under these realities. However, this profit maximization should also be

⁴¹⁴ Public consultation review of the markets in financial instruments directive (MiFID); http://ec.europa.eu/internal_market/consultations/docs/2010/mifid/consultation_paper_en.pdf

put in perspective: they could give a preference to allocate shares to investors that would potentially create future business for the bookbuilder, even at such a degree that they are prepared to offer them shares at a lower price than what the market would theoretically be willing to pay (thus creating a conflict of interest, detriment for the issuer). Some jurisdictions may choose to forbid discrimination in allocation.

It is however not always compulsory to use an underwriter or a bookbuilder. In some markets, or at some exchanges it sometimes happens that the free float of shares is marketed and sold to the public by the company itself, often called a Direct Public Offering. Such Direct Public Offering can even take place apart from a listing, and it may thus theoretically be performed through internet infrastructure that allows promoting the offering directly, but that does not offer listing services or that does not use the notion of listings (or maximum a listing-on-demand). Listing is an activity that is reserved to operators of Regulated Markets.

Direct access internet platforms may also offer an auctioning system for instance, to still offer a pricing mechanism that bookbuilders would otherwise perform. There, investors can compete between their peers to obtain shares, by means of bidding. Highest bidders will first be allocated shares. In contrast to a traditional process, the bids from potential investors are binding (instead of expressions of interest) and they are not merely an information revelation tool.

3.2.4. Do upcoming legal interventions address government failures?

The upcoming MiFID II Directive, will besides MTFs also create the notion of OTFs, namely Organized Trading Facilities, and SME markets:

- MTF will according MiFID, article 4, no. 15 remain “a multilateral system, operated by an investment firm or a market operator, which brings together multiple third-party buying and selling interests in financial instruments – in the system and in accordance with non-discretionary rules – in a way that results in a contract”.
- OTFs will under MiFID II be venues that have “a degree of discretion over how a transaction will be executed”,
- SME markets (art. 35) will be a sub-form of MTFs (thus explicitly recognizing their listing capacity, instead a merely a trading venue function).

Some rules that will apply to such SME markets, which require a specific registration provided by the home authority to the applicant MTF, are requirements for procedures to ensure that:

- the majority of issuers are small and medium-sized enterprises;
- appropriate criteria are set for initial and ongoing admission to trading of financial instruments
- when initially admitted to trading there is sufficient information to enable investors’ informed judgment (prospectus rules apply)
- there is appropriate ongoing periodic financial reporting by the issuer
- issuers and their management comply with relevant requirements related to Market Abuse Regulation

- the storage and public dissemination of regulatory information concerning the issuers is regularly performed
- there are effective systems and controls to prevent market abuses

An implications of listing on an SME markets will be that if a financial instrument of an issuer is admitted to trading on one SME, it may also be traded on another SME growth market without the consent of the issuer (no obligation for the issuer).

However, issues that have been discussed above, namely the deeply entrenched fact of having to use intermediaries, instead of allowing direct access access, is still visible in art. 51, as Regulated Markets, MTFs or OTFs that provide direct electronic access must:

- ensure members providing the services are authorized investment firms under MiFID
- ensure persons having access are suitable
- ensure members or participants retain responsibility for orders and trades executed using that service
- adopt controls and thresholds concerning trading through electronic access
- distinguish and if necessary stop orders by a person using electronic access separately from orders or trading members
- ensure their fees and rules on co-location services are transparent, fair and non discriminatory
- upon request by the authority make available data or give access to the order book to monitor trading

Thus, and this is perhaps unfortunate, it still assumes the compulsory (instead of voluntary) use of intermediaries to access such market. But on the positive side, MiFID II has thus recognized the importance for better public equity trading and fundraising for SMEs. In fact, it can be considered as an articulation of the fact that SME markets need listing venues that are less demanding than traditional markets, through creating a specific label: SME growth markets. This new MiFID label will certainly have a useful function on its own, as it provides an opportunity for other legislation to make exemptions or special allowances for these markets – simply by using this label in conjunction with a specific set of rules. The new venue label will have to go a long way of course, and will have to propagate through other regulations. The introduction of an SME growth market category, however, is only the first step in making the new label viable: subsequent legislation must support these venues and the companies listed on them: potential candidates to adopt specific sets of rules may for instance be the Prospectus and Transparency directives for the issuers and Market Abuse regulation for the market participants.

After all, MiFID II does only foresee very limited rules itself for such SME growth markets. For instance, it continues to use the current system of MiFID-regulated MTFs in conjunction with the Prospectus Directive: there is no disclosure required when securities of a firm start trading on an MTF – such disclosure is only required at the time of a public offering itself (which may however take place simultaneously at the moment the securities start trading on the MTF) or if the rules of the venue would foresee some disclosure during the introduction of the securities to the venue.

MiFID II also thankfully shifts a part of the compliance obligations to the SME marketplace itself. One of the aspects of article 35 of MiFID II is the requirement for market operators, to have effective systems and controls to prevent market abuses. Shifting part of the compliance obligation to the market operator, should be applauded as it enhancing market quality and investor confidence, while not being an extra burden or cost that should be at the expense of the companies that trade on the market. Of course, I realize that while I applaud the deal presentation and deal promoting possibilities that the hypothetical disintermediated platforms may have, that this may however create particular stress to police such platform to still comply.

3.2.5. Quasi equity and the crowdfunding market infrastructure

Although the internet can theoretically bring direct access platforms that are conducive for fundraisings for technology-driven firms, path-dependent regulations thus heavily limit their emergence. However, there are also other elements in the legal infrastructure that have an adverse effect on the emergence of direct access internet-based platforms.

Earlier, I discussed that many startup firms use company types that are trade disabled and that cannot raise funds with the public. They can also not use the type of infrastructure that has been discussed until now. However, internet entrepreneurs sought creative ways to still offer platforms that cater to such companies, and to work around those limitations that they have. This led to the creative practice of equity and profit-sharing crowdfunding platforms, among substitutes and other forms of crowdfunding like pre-ordering⁴¹⁵, where the offering of straight equity is actually rare or non-existent. In reality, most platforms offer quasi-equity, or instruments that mimic equity in the investee. But by stepping away from the standard equity, users are not necessarily presented with the most investor-friendly or the most crystal-clear terms.

The barriers and formalities that small firms face (i.e. involvements of trusted third parties like notaries) are a reason why some internet entrepreneurs have discovered a business opportunity to offer crowdfunding for such companies that would otherwise probably not be able to offer equity to the public at all.

For instance, platforms have designed transaction models that repack the company's stakes in a vehicle that can actually market and sell its own units to the public. Savvy platform operators thus found mechanisms like using intermediate legal entities ('special purpose vehicles' if you like) that would be able to issue notes publicly more easily.

Another solution is engineering contractual investment instruments with similar pay-off characteristics like equity and that can be sold to the public, without facing barriers under company law.

⁴¹⁵ Paul Belleflamme, Thomas Lambert and Armin Schwienbacher, 'Crowdfunding: Tapping the Right Crowd' (2014) 29 *Journal of Business Venturing* 585.

This is in general what crowdfunding platforms (which will be discussed later) actually do today, and where they draw their market from. Thus, they rarely function like marketplaces where buyers can directly buy equity from issuers (but even such a setup would face limitations that will be discussed under a next title). Exceptions are of course possible. For example: platforms that act as nominee for direct equity in an investee (like UK-based Seedrs⁴¹⁶).

I prefer to call both models “transaction engineered” models. And even if the popular literature still classifies them as equity crowdfunding, it is not always equity from a legal point of view, due to these transformations. Equity-like is sometimes more appropriate.

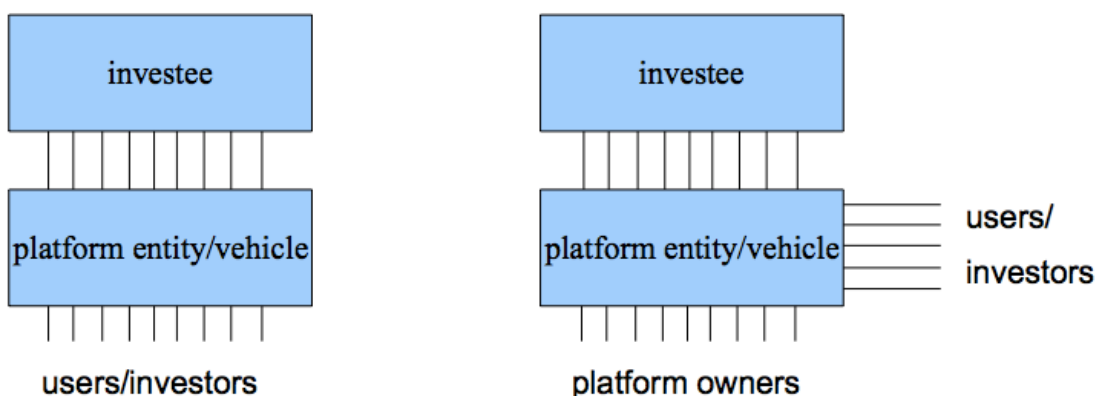


Figure 3: fund-based (l) versus contract-based (r) transaction engineered crowdfunding

Of course, these two “engineered” models, to circumvent the limitations of selling securities under company laws, are not conclusive. In exceptional cases, crowdfunding platforms might still use other legal instruments or structures. For instance, I assumed until now that investees would use legal entity types with corporate characteristics. But some entrepreneurs may even choose other structures: for instance contractual partnerships which may not face so many limitations to accept new contractual parties.⁴¹⁷ Such structures are however not very popular in continental Europe, as there may be default rules and mandatory rules that kick in unexpectedly, thereby creating legal consequences that parties do not want or that they experience as uncertain about their legal status. Also, they may expose the entrepreneur to unlimited liability. Still, the German crowdfunding market makes a lot of use of silent partnership as the market is familiar with those legal structures there.

In “transaction engineered” models, it is very common that the crowdfunding platform, or at least a related entity, becomes a counterparty or issuer, but the transaction will ultimately put an investor in a similar financial payoff situation as if he would have underwritten shares in the portfolio/underlying company

When using the intermediate holding solution, this may certainly offer the same payoff structure as a direct investment in the investee, but it obviously requires a holding

⁴¹⁶ www.seedrs.com

⁴¹⁷ For contractual company types, see for instance: Larry E Ribstein, *The Rise of the Incorporation* (Oxford University Press 2010).

vehicle that does not require difficult formalities to obtain a stake in it, not even for the payment of the stake.⁴¹⁸ Potential vehicles are some public stock companies, or cooperative entities in some jurisdictions. Symbid⁴¹⁹, a Dutch platform, uses for instance a cooperative because it easily allows accepting new members/investors (after a successful campaign, investors receive a membership stake in another special-purpose holding vehicle, that is specifically set up for the final investee). In case contractual instruments are sold, then this offers much more freedom to customize it, without the traditional formal requirements that may be imposed when a security in an entity is obtained (except from the public offering rules and exceptions, as those may still apply).

The wide availability of different models, where each platform tries to defend its model and tries to seek hegemony in the market (also towards lawmakers that look to improve their legal framework), may certainly be confusing for lawmakers, users and investors.

But such models often imply that the platform operator will be part of the holding structure for a long time. A platform that continues to hold and manage the stakes in the investee, after a successful campaign, is for instance Hong-Kong based GrowVC⁴²⁰, under a contract-based design. But in case of contract-based models it should be noted that such contracts may in some cases be considered as derivative securities by securities regulations.⁴²¹ However, such contracts should also be applauded for letting revive a forgotten type of financial instrument that has been widely used in project finance in the past (i.e. for mining concessions, for film productions): hybrid instruments that contractually design the features that may either be debt- or equity-like, or something in-between. Such hybrid instruments will be discussed in the next part of this study, as they face regulatory barriers on the fiscal level.

And in case of holding-based models, it may be noted that this unconsciously resulted in crowdfunded “pledge funds”, namely funds that do not operate as the typical blind pools with substantial agency problems as the manager makes the investment decisions, which may potentially be influenced by his opportunistic behavior. Instead, the active investment decision from the investor reduces many sources of agency costs that put him in conflict with the manager over the capital that can be distributed to the investors or that can otherwise be used to subsidize opportunistic behavior from the manager, except for sources of conflict and agency problems that are linked to decisions that need to be made during the holding of the stakes in the investee (i.e. voting decisions, exit decisions, all to the extent that the investor would have no influence – which may not always be true).

⁴¹⁸ The fact that many company laws also require that contributions must be paid to a bank account, hasn't been discussed yet (see for instance: French Commercial Code art. L223-9; Belgian Companies Code art. 311; etc.), but it is already more hindering than being able to accept credit card payments to pay for the stake in an entity.

⁴¹⁹ www.symbid.com

⁴²⁰ www.growvc.com

⁴²¹ See for instance Prospectus Directive, article 2, 1 (a) which refers to the Investment Services Directive 93/22/EEC, article 1, 4; and which has been replaced by the similar MiFID directive article 4, 17 and 18

A problem with some of these arrangements is that the liquidity or mobility of the instruments is tied or limited to the platforms. Therefore, either we must explore possibilities to allow that such platforms also organize a secondary market for their platform-specific instruments (effectively secondary markets for negotiable instruments), or we must explore better opportunities for entrepreneurs to actually be able to sell equity in their company as this is already a highly standardized instrument for which market infrastructure is also available (i.e. listing and trading venues that are excellent for secondary trading). Both routes do not have to be mutually exclusive. However, in case of the latter route, where entrepreneurs would actually be given more opportunities to default to selling equity instead of being forced to use alternative instruments that may potentially put them in lock-in situations with platforms, it is also important to reconsider the settlement and depository systems of shares, to allow mobility of shares between different market infrastructure for trading. As I will highlight later under clearing and settlement discussions, this should also include a regained interest in dematerialized and centrally run (through centralized information systems) shareholder registers, instead of defaulting to dematerialized shares.

Internet entrepreneurs in various parts of the world thus try to create platforms that offer various equity-like instruments that can be marketed and sold to the public. However, the practice of doing so (as a platform) may touch the regulations regarding investment services, brokerage services and exchange platform operations, although most platforms may want to avoid this. The essence is that many platforms essentially combine the marketing aspect with a deal closing aspect.

As these platforms have an incentive to have enough “conversions” (namely visitors that do not only consider the marketing, but that also in a transaction on the platform), they also perform a function or at least also have an incentive to positively influence the investment decision of clients. This means that potentially, agency problems may need to be addressed. However, regulators rarely have this luxury to reason in such principle-based terms, and rather have to decide if such platforms fall within one of the categories of intermediaries under regulations that mainly had another type of actor in mind when they were drafted.

What model a platform ultimately offers, depends often on the national interpretation of supranational rules like MiFID (or on the national exceptions that are adopted under article 3 of MiFID). Since the Markets in Financial Instruments Directive (MiFID Directive 2004/39/EC), there's little room for unregulated activities in Europe. The scope of regulated activities goes much further than investment advice alone. Such platforms also don't generally make (personal) recommendations to investors or potential investors or to their agents.⁴²² But the main problem will come from the scope of other regulated activities. Regulations like the MiFID directive, and certainly its national implementations and interpretations, struggle with the kind of innovative financial services like crowdfunding. A main consequence will be that the transaction

⁴²² And should generally not be considered as offerers of investment advice, by following the guidance paper with reference number CESR/09/665 from the Committee of European Securities Regulators. Investment advice is one of the regulated activities by the MiFID, since it appears in the list of regulated activities in Annex I, Section A.

engineered model will reinforce and entrench itself: after all, if the crowdfunding platform operator would still consider himself as a marketplace operator, then the transaction engineered nature will in most cases result in a classification under a category that resembles more a broker/intermediary than a market operator (if the activity is considered as a regulated one). The platform operator would face a regulatory regime where compliance is more intended to address agency costs and potential negative externalities from the self-interest of the intermediary, than the monopoly-addressing nature that rules for market operators may have. It is in fact a bit odd to place platforms in a category that basically addresses agency problems and information asymmetries between principals (clients) and agents (investment service providers, thus intermediaries), while most platforms initially intended to be more a type of facilitator to passively bring parties together (like a market operator). It is often a result of the regulations that they take a second best structure and that they often a second best transaction model (that closely resembles equity), but by doing so they actually also become more an agent instead of merely a platform operator.

Depending on the extremeness of an interpretation, the relevant regulated activities may be:

- ⇒ Placing of financial instruments without a firm commitment basis;
- ⇒ Placing of financial instruments on a firm commitment basis;
- ⇒ Execution of orders on behalf of clients;
- ⇒ Reception and transmission of orders in relation to one or more financial instrument
- ⇒ Services related to underwriting

It is debatable if such crowdfunding platforms qualify for one or more of such activities, and good reasons can be provided to motivate against potential motivations. For instance, the financial market authority in Austria generally accepts the practice that shares in a private company (GmbH) are not considered falling within the definition of a financial instrument (which need to be “transferable” securities under article 4(1)(18) of the MiFID directive).⁴²³ And since the activities are only regulated when they apply to financial instruments, it effectively means that many crowdfunding platforms would not undertake a MiFID regulated activity there. However, the Finnish Act on Investment Firms and the guidelines issues by the Finish FSA considers shares in unlisted companies as financial instruments.⁴²⁴ But uncertainty over interpretations will not always be situated at the applicability of the MiFID directive in general. It might also be at the level of individual regulated activities. To start, an inherent characteristic of

⁴²³ See: Dorda Brugger Jordis Rechtsanwälte GmbH, Austria, in MiFID – Technical Briefing Note, An EVCA Special Paper, European Private Equity & Venture Capital Association, 2008, 3.1

⁴²⁴ See: Attorneys at Law Borenius & Kempainen, Finland, in the above mentioned publication. Of course, Artificially reducing the transferability of a share, if the applicable company laws didn't already limit the transferability, to avoid it being classified as a financial instrument, might be an option in such cases, but it makes the crowdfunding campaign process less appealing to firms and to investors: investors see a reduction in exit possibilities, and firms have to offer an illiquidity discount. However, it should be questioned if the practice where private parties react to regulations by restricting the liquidity of a share, is really desirable when fostering innovation is also at stake.

transaction-engineered platforms, is that they will act as an underwriter once a campaign has ended successfully. This comes very close to the MiFID regulated activities, namely the “Underwriting of financial instruments and/or placing of financial instruments”, as listed in Annex I Section A of the MiFID Directive. However, such platforms normally don't offer this service, as it is done by typical securities underwriters (investment banks for instance) in the regular financial circuit, which should be understood as bearing the risk of having to underwrite the remaining of the offered securities if no buyers for all the securities could be found, or just not. Crowdfunding platforms never commit themselves to such type of obligation, but they merely offer a conditional standby commitment, where they will underwrite a share issuance in case it was able to collect enough funds itself. But it is an inherent risk that some regulators might (inadvertently) consider this “standby commitment” to fall within the scope of the regulated activity. And even if a regulator would not consider it to be a placement or underwriting activity, there's still a chance that the activity would be considered as a service related to underwriting, which is an ancillary service under MiFID: this means that it should be licensed at national level, requiring such a national license in every country where the service is offered (which makes cross-border operations very expensive). Another example to illustrate interpretation problems is the activity of reception and transmission of an order: this may for instance be a problem in case a platform-dependent special purpose vehicle that actually accepts and holds the payments from the users/investors, is a separate legal entity from the platform operator. However, there is a very high likelihood that some national regulators would consider this to be the acceptance and transmission of orders by platform operating entity towards the separate entity. Compare this to a private equity fund management company that processes an order from a client to invest in a private equity fund that is managed by the management company and which is for some regulators the activity of reception and transmission of an order. Finally, other activities will offer less uncertainty: for instance, if crowdfunding platforms would operate by way of acting as a proxy for the investor, than it will not give rise to a lot of doubt to certainly classify this as an execution of orders on behalf of clients.

However, besides entrenching platforms in a role that they had not in mind in the first place (namely intermediary instead of market operator), it is also a problem of legal uncertainty since national lawmakers and supervisors might disagree on certain qualifications and interpretations. This makes it very difficult to operate a platform on a cross-border basis, and we can openly ask the question if the rules should not adapt to this situation in order to solve this uncertainty, either by creating a carve-out, by creating certainty under a harmonized regime (like the JOBS Act did, in the United States), or by leaving room for country-specific choices (and potentially even considering a passport for non-harmonized regulatory regimes to create some regulatory competition like we see in the company law domain following the *Centros*, *Überseering* and *Inspire Art* decisions that created a market for incorporation). But law- and policymakers should certainly not be blinded by the pressure of the different “models” that each try to fight for hegemony, and self-promote their model, and thereby also trying to use the law- and policymaker as a tool to create barriers to entry for competitors under other models.

Also, under the current situation, if a transaction engineered platform would be considered as a MiFID regulated activity, it immediately opens Pandora's box of

secondary problems besides the prohibitively expensive compliance costs: namely the problem if website users (investors, potential investors) should be considered as clients, and consequently approached in a regulated way, and also if the commission based model of the platforms violates the MiFID inducement rule which forces investment firms to act in the best interest of its clients. But this implies a choice between two sources for the fees or the commissions: either they have to come from the clients itself, or alternatively from a third party under the conditions that the calculation method is clearly disclosed and that fee/commission system must be designed to enhance the quality of relevant service to the client and not impair compliance with the firm's duty to act in the best interest of the client.⁴²⁵ Now, most crowdfunding platforms operate on a commission basis, which has to be paid by the investees. The platforms are generally free or close to free for investors. Therefore, if users/investors are considered as clients, this inducement rule might prove to be very impractical for the system since it might be problematic to prove that a platform operates in the best interest of the investor, if the main self-interest of the platform is to sell as much stakes as possible.

Platforms would also be forced to categorize their clients in advance, but while the process alone where information must be solicited from the user-client already makes using the platform less appealing and less of a one-click experience, it should not be an insurmountable problem. Anyway, as soon as a client is categorized as a retail client (the bulk of the users of today's crowdfunding platforms) or as a professional client, the platform operator would be obliged to give him or her advice, and if regulators would require personalized advice to a certain extend, then this would defeat the whole purpose of a website. Perhaps, the example of the recent Italian "crowdfunding law" (Law Decree n° 179/2012), to specifically regulate the country-specific promotions below €5 million, is a good way to go and to solve uncertainty. Especially for this aspect of the implementing regulation for article 30 of the Law: a platform operator must provide retail investors (according to MiFID classification) with a set of mandatory information regarding risks that are associated with investing in young firms (for example loss of capital, illiquidity, rarity of dividends, dilution, need for diversification); information and practical instructions about the right of withdrawal; the periodicity and the methods with which they will be provided with information on the status of pledged, the amount subscribed and the number of investors; fees and costs charged to investors; the applicable law and the competent court; the language or languages with which information concerning the offer is provided. The retail investor must demonstrate that they understand the nature of the activity of the portal, the nature and specificity of the financial instruments issued by innovative start-ups and the relative risk of each offer. Similar provisions can also be found in the JOBS Act, which also contains yet to be implemented regulations for crowdfunding "portals" (= platforms).

⁴²⁵ A conflict with the inducement rule, stems from rule in article 19 of the MiFID directive, and is more specified in article 26 of the MiFID Level 2 Directive, where there is effectively a choice between two sources for the fees or the commissions: either they have to come from the clients itself, or alternatively from a third party under the conditions that the calculation method is clearly disclosed and that fee/commission system must be designed to enhance the quality of relevant service to the client and not impair compliance with the firm's duty to act in the best interest of the client.

The only advantage that a crowdfunding platform would have, when it qualifies for some MiFID regulated activities, is that it can thus benefit from the European passport that is provided by the MiFID directive, and which allows to easily operate on a cross-border basis (at least, if there would be no other cross-border barriers).

Also, while the implications and uncertainties regarding the European MiFID directive have been discussed, it should be highlighted that these cannot easily be compared with the situation for American crowdfunding platforms, where the notion of “broker-dealer” will decide if they perform a licensed activity or not: namely “any person engaged in the business of effecting transactions in securities for the account of others” (brokers) or “a person or entity engaged in the business of buying and selling securities for such person’s own account” (dealers). In the definition of brokers, effecting transactions can also merely be facilitating negotiations or order-taking, order-routing or handling customer’s securities. For the SEC, receiving a transaction-based remuneration also tips towards a classification as broker-dealer. Applied to crowdfunding, it may be debatable if all crowdfunding platforms are acting “on behalf of others”, if a finder is receiving some form of commission or transaction-based compensation, it will generally be deemed a broker-dealer by the SEC, and it will not only require to register with the SEC, but also with every state where the platform will be active towards users, which implies a significant compliance cost for such platforms.

Then, for the case of the holding-based approaches, as long as they are considered as closed ended funds (which they normally will, as redemption is not possible), the marketing of their equity stakes (or other units) will still qualify to fall under the prospectus regime and exceptions that have been described above, just like ordinary firms. If they would be considered as open-ended entities (I.e. due to the possibility to underwrite new shares during a continuous time), then they may become victim of country-specific non-UCITS marketing and managing rules that are completely blind for this self-organized mechanism to take away agency problems. They will however certainly not fall under the harmonized UCITS definition under this unlikely case, as the UCITS IV directive 2009/65/EC only applies when collective investments in mainly listed transferable securities, or other liquid financial assets are made; and with units which are repurchased or redeemed at the request of holders. And if we continue this unlikely classification, then because of their unregulated nature under the UCITS directive, this could make them subject to the definition of an Alternative Investment Fund, under the Directive on Alternative Investment Fund Managers (AIFMD 2011/61/EU). This definition is very wide, and it captures both open-ended and closed-ended funds, both retail and professional funds and applies irrespective of the investment class and irrespective of the legal form: still it will not meet the €100m de minimis threshold of for the harmonized (passporting) regime. Article 3 AIFMD still requires that member states implement a minimal regime consisting of at least a registration requirement, and information requirement. Also, the Directive expressly gives the possibility to implement stricter rules and not every member state has to allow the marketing of AIFMs to retail investors (and unfortunately, the exception under the form of a European passport for venture capital funds that would otherwise have to operate in the regulatory fragmented and unharmonized zone where the AIFM directive does not yet apply, is only relevant when eligible counterparties are approached).

Due to different interpretations, a transaction model might be acceptable in one country, but might stumble on problems in another country, even if they largely transact around the same set of European rules. Because the transaction cost is considered too high to comply with the regulations, many platform operators prefer to qualify as a non-MiFID licensed business.

However, the problems for crowdfunding platforms do not end under these regulations that have been discussed. For instance, collecting and holding money before it will be released to the entrepreneur or before it may become available again to the investor, may be subject to severe limitations as such platforms cannot hold accounts like traditional retail brokers or banks can do as they lack a credit institution license (required for reimbursable deposits⁴²⁶), or like an e-money institute should have⁴²⁷. Still, a goal of internet-based platforms is also to secure the commitments of investors, even before the actual equity raising. The most secure way is by collecting money from users/investors at the moment of the commitment, to prevent dealing with individuals that would not honor their commitment later on (this involves high individual transaction costs). The funds are then readily available when the time has come to underwrite the capital raise with the investee. This saves the hassle from separating (underwriting) contract formation from actually claiming payment obligations (the theoretical difference between the existence and the execution/settlement of a contract).

For such payment settlement, platforms rely in many cases on upfront fund “uploads” or payments at committing to invest (even before the goal is reached), with neither of them repayable on demand – or at most through an automatic repayment in case of a failed funding round. This way, they are not to be considered as a credit institution. Even when the funds are not used to offer credits, member states are still free to regulate the activity of receiving deposits or reclaimable funds alone (in isolation of applying them towards credits). For instance, in The Netherlands, article 3:5 from the Law on Financial Supervision forbids to attract reclaimable deposits, outside of limited group of people. In essence, you act as a bank if you would do so, and it would require an appropriate license. To “solve” that, internet-based platforms may not offer a possibility to claim money back from, in case of a failed fundraising campaign (but it is not forbidden to give the users/investors the possibility to use the funds for other purposes then, i.e. to allocate it for another campaign⁴²⁸). This does however heavily reduce the attractiveness of some platforms. Another problem is, that electronic money

⁴²⁶ See Directive 2006/48/EC, relating to the taking up and pursuit of the business of credit institutions, article 4 (1) (a). ⁶³ Directive 2006/48/EC, article 5.

⁴²⁷ Directive 2006/48/EC, article 4 (1) (b), and Directive 2000/46/EC, which is succeeded by Directive 2009/110/EC. Electronic money is defined as electronically stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions as defined in point 5 of Article 4 of Directive 2007/64/EC (“an act, initiated by the payer or by the payee, of placing, transferring or withdrawing funds, irrespective of any underlying obligations between the payer and the payee”), and which is accepted by a natural or legal person other than the electronic money issuer (in this case this would be the investee). This definition implies that some transactions will fall within the scope, if a member state chooses not to exempt electronic money institutions with less than €5 million outstanding credit (member states have the option to exempt certain situations).

⁴²⁸ A dutch crowdfunding platform that is organized that way, is sybid.com

institutions are also considered as credit institutions. Some transactions may fall within the scope within the scope of electronic money.

Another solution to prevent falling under the scope of such regulations is that platforms contract with a suitably licensed party that will hold the money of investors, whereby the platform operator thus more starts to act as a technology provider. Another set of problems for disintermediated platforms is thus not only the securities settlement (discussed later) but also the cash settlement.

Also, if platforms want to segregate client money from their own funds, then this segregation practice is not everywhere recognized. Common law firms may use trust like principles for that, and Dutch firms may use foundations for that. But the use of different institutions the reach the same goal, is already problematic as such as it may not follow market practices of other countries and may therefore be unattractive for users in other countries. The same problem of segregation event exists on a finer level: not every construct will allow segregation on the level of each individual investor. Trust principles do not require much formalism, and can thus easily be applied for the holding of every individual investor separately. But a foundation will not be created for every single investor – and investor money can then still be pooled even if it is segregated from the operational entity that runs the platform.

Also, using segregated bank accounts, that are not exposed to risk in case the platform operator would go bankrupt, is not in every country possible or generally used without special legal constructions (i.e through a separate foundation, or trust like solutions).

We observed that country-specific particularities heavily hindered the possibilities to undertake business cross-border, which consequently also limits the scale of operations that crowdfunding platforms would like to reach. In fact, it would certainly be worth considering to create legal certainty for such platforms, as they may act as incubators for the firms that they fund and it may also be a selection pool for companies that can later opt for a listing on a traditional exchange. Such companies will also already have useful experience with public scrutiny.

The actual quasi-equity crowdfunding models that have emerged, through regulatory forces and limitations in company law, are actually interesting in their own right. For instance, the sale of contractual rights that could be designed to mimic equity features can also be adjusted to optimize the pay off structure even more, so it becomes a hybrid between debt and equity. This may combine the best of both worlds, although at a cost of losing crystal-clear understanding and expectations at the level of the user. For instance, platforms may model contractual rights in such a way that the pay-off is based on a percentage of the revenue, instead of the residual gains like equity. This revenue sharing pay-off is something that will be more extensively discussed in the next part of this study, as it also faces barriers under the legal infrastructure.

3.2.6. Regulations that hinder conductive search-only infrastructure

Today, the internet is thus putting new pressure on the regulations. And although crowdfunding is getting a lot of attention these days, we must recognize that they actually combine two functions: namely the marketing of open calls (including potential investor relationships, and trust building with those potential investors), and the deal-closing function. In fact, it starts to combine two functions again that were already present in the early days of floor-based exchanges, but where only the deal closing function survived once electronic exchanges emerged (the split off function of offering marketing channels and marketing means, worsened instead of further developed).

Some infrastructure is arising that solely offers the marketing function, parallel to crowdfunding platforms that combine the two functions. When only a small number of more substantial investors are sought, where individual negotiation costs are still manageable, such online marketing or syndication platforms may act as a good facilitator. Due to the particularities of young companies, and especially the risks involved, the deal closing aspect can sometimes be more effective offline, on a customized basis than on an online standardized basis. For instance a platform for business angels to co-invest in specific deals can create efficiencies in this domain, and it can also be extended to later rounds of financing.

Such platforms can potentially be classified as an intermediary, although this sometimes depends on the remuneration and fee model of such platforms as it might be dependent on the outcome of potential investments which may they create certain incentives for the platform to present the investments better than they really are. The same struggle exists with allocating responsibility for content. However, platforms are not technically providing the material information on which a user will take an "investment" decision. The material information or the content is actually provided by the project managers themselves, and the platform operators merely police the information. Platform operators experience a lot of uncertainty about this position: as they are a contractual counterparty towards investors, they know that regulations and contractual liabilities can point to them, despite the fact that they have not an active (but merely a passive/policing) input in the information on which investors act. They are remunerated based on a commission that is dependent on the user actually making an investment. Thus, theoretically, platforms still have an interest in inducing people to invest (in the vocabulary of e-commerce: that the conversion rate from merely viewers to actual funders would be high) - even if this incentive is exercised in a passive and mass-communicated way instead of an active and personal way like traditional regulations to address agency problems had in mind.

A transaction-based remuneration is a criterion that the SEC uses in the United States to classify an entity as a broker-dealer. Nonetheless, a no-action letter has been issued ("Angel Capital Electronic Network").⁴²⁹ It draws the line whether an online matching system needs to register as a broker-dealer or as an investment advisor or not: this is not required as long as no advice is provided regarding the merits of particular investments, if there is no participation in the negotiations between members of the

⁴²⁹ Donald C Langevoort, 'Angels on the Internet: The Elusive Promise of Technological Disintermediation for Unregistered Offerings of Securities' (1998) 2 *Journal of Small and Emerging Business Law* 1; Jane Kaufman Winn, 'Regulating the Use of the Internet in Securities Markets' (1998) 54 *The Business Lawyer* 443.

platform, and as long as the platform only charges flat fees (certainly not transaction-based) from its users that merely serve to cover administrative costs.⁴³⁰

Technically, the SEC has determined that the computer matching services and investment symposiums do not constitute general solicitations, even though an entrepreneur who participates in those investor forums does not have a preexisting relationship with each investor. Such website may even serve to create preexisting relationships, if it is not specifically run by an issuer (but by an intermediary for instance, who is not performing general solicitation for a specific offering but who generally builds and rents is network of preexisting relationships). And if an investor takes the initiative to approach presenting entrepreneurs, then this is not considered to be a general solicitation.⁴³¹

Internet based platforms that were already active around the turn of the millennium were for instance Local Fund and Funding Match in the US, and the Private Equity and Entrepreneur Exchange and Aussie Opportunities in Australia. Of course, many initiatives in the offline world have also performed such deal presentation, coordination and syndication functions in the past: business angel networks, venture events, but even investor media.

3.3. The forgotten element: post-trade infrastructure

For those companies that took a legal form that allows to openly sell equity to third parties or to have publicly tradable equity, the problem is thus not only to have suitable promotion infrastructure (and perhaps also contracting infrastructure). For a swift settlement of their transactions, such companies also need to have access to infrastructure that manages the ownership change information in a way that is compatible with the underlying legal principles. Those principles make a sale opposable to both the company (i.e. to exercise voting rights) and to third parties (i.e. later buyers). This is mainly a matter of information processing, according to a unified system that offers certainty if everyone follows one single state-provided system. But these state-provided systems are often very formalistic and therefore very slow. To accelerate trades, clearing and settlement infrastructure providers created a more efficient system for the members that participate in that system. The problem is however that the path dependency of paper-based shareholder regimes have created overly complex systems that are many times more complex than registry systems should be. Small companies are often practically “ineligible” to participate in such costly infrastructure. However, participating in such costly infrastructure is often a prerequisite to participate in trading venues. For investors, it also means that they need to rely on intermediaries to participate in that infrastructure, as a permitted participant will need to pay systems fees, have specific high-end computer systems. Thus, only large institutions will qualify to meet these minimum terms.⁴³² This will thereby

⁴³⁰ Abraham Cable, 'Fending for Themselves: Why Securities Regulations Should Encourage Angel Groups' (2010) 13 University of Pennsylvania Journal of Business Law 107.

⁴³¹ Ibid.

⁴³² Philip R Wood, *Set-Off And Netting, Derivatives, Clearing Systems* (Sweet & Maxwell 2007).

effectively transform investor's direct equity holdings into an intermediated form of ownership.

The high participation threshold in such clearing and settlement infrastructure is however not the only problem. Every country has historically created its own infrastructure – and this is very costly for a number of reasons. First of all, it creates duplicate costs. Secondly, it is costly for an intermediary or other user to pay the costs to participate in multiple systems (to be able to offer cross-border access to clients), or at least it requires the services of yet another intermediary abroad (this stacking of intermediaries indeed creates an accumulation of costs).⁴³³ Policymakers assumed that this problem of disconnected holding chains would automatically solve itself, through market forces – either leading to international central services (like Euroclear and Clearstream), to intermediaries that use other sub-intermediaries or to interconnected national services.⁴³⁴

Just like with exchanges, two schools of thought and possible outcomes are possible to solve this societal cost: the first school recognizes the network externalities (the more users, the more useful it becomes for the users) and they thus imagine an outcome where market forces will create a single service that serves the different trading and promotion infrastructures on a cross-border (pan-European) basis. Although this will be a monopolist, the saving on duplicate costs will offer a societal advantage (and at least antitrust laws can temper the incentive to charge monopoly rents). The second school considers a setup where information technology allows interlinking different systems in a standardized way in order to make the cost of having multiple infrastructures only a marginal element.⁴³⁵

In a communication to the European Council and Parliament in 2004, the European Commission refused to take any position or to suggest any market architecture to solve the silo problem, and to maximize social welfare. It stated "Market forces will determine the "final" structure of the Clearing and Settlement industry".⁴³⁶ However, the outcome that we have today is not a social optimum as the depositories are still organized nationally and cross-border settlement, or participation in trades cross-border is still costly.

Also with earlier lawmaking initiatives, substantive law of cross-border securities movements was considered more important than improving the institutional setting. Indeed, existing regulations have mainly focused on providing legal certainty and protecting participants in clearing and settlement systems. Also addressing issues relating to the legal protection of third parties, like collateral systems, were considered

⁴³³ Changmin Chun, *Cross-Border Transactions of Intermediated Securities: A Comparative Analysis in Substantive Law and Private International Law* (Springer 2012).

⁴³⁴ Karel Lannoo and Mattias Levin, *The Securities Settlement Industry in the EU: Structure Costs and the Way Forward* (CEPS 2001).

⁴³⁵ Peter-Jan Engelen and Karel Lannoo, *Facing New Regulatory Frameworks in Securities Trading in Europe* (Intersentia 2010).

⁴³⁶ European Commission, 'Commission's Communication to the Council and the European Parliament Entitled "Clearing and Settlement in the European Union - The Way Forward"' (21 July 2004) <http://ec.europa.eu/internal_market/financial-markets/docs/clearing/2004-consultation/ministry-finance-fi_en.pdf> accessed 26 August 2013.

more important than the infrastructural issues. For instance, Directive 98/26/EC of 19 May 1998 on Settlement Finality in Payment and Securities Settlement Systems, whose basic goal is to ensure finality (bindingness) for transfers of cash and book-entry securities in a clearing and settlement system. Relating to infrastructural aspects, the Finality Directive merely states that “Member States may impose supervision or authorization requirements on systems which fall under their jurisdiction”. Also international initiatives focused more on the rights that are attributed to securities. Namely The Hague Securities Convention (yet to be ratified by many countries) addresses conflict of law questions regarding rights in respect of securities held with an intermediary. Then the Unidroit Convention on Intermediated Securities defines a common substantive regime governing some essential aspects of holding and transferring intermediated securities (i.e. the exercise of rights by securities account-holders, the integrity of the link between open accounts and securities held by an intermediary, measures to protect account-holders in the event of insolvency, etc.). However, the latter convention allows the domestic rules regarding Central Securities Depositories (CSDs) to take precedence over those of the convention itself.

While state-provided law did not step in to solve this costly cross-border problem, a Code of Conduct that was promoted by Commissioner McCreevy, hoped to create a self-regulatory approach and hoped to facilitate an interlinked model, through interconnection (interoperability) between these infrastructures.⁴³⁷ However, no standardization efforts took place in the market to improve the interlinking between different decentralized infrastructure providers (from a European point of view, not from a national point of view), and the links remained costly and underdeveloped.

As this self-regulatory intention to create linkages between decentralized infrastructure hasn't been successful, and just like in the domain of central counterparties and exchanges, a regulatory move recently emerged and this has been towards stimulating competition. But parallel to that regulatory move, a state-sponsored standard is created to solve the coordination problem between the fragmented infrastructure providers. Since no standard to lower the interlinking costs emerged in a market-driven way, a government-sponsored pan-European central infrastructure is currently under development by the European Central Bank: the Target 2 Securities system.⁴³⁸ But despite this standardization, I will also highlight the remaining prohibitively high threshold for small companies to participate in such system.

3.3.1. Two systems under company & property law

In many domains, one of two systems is in use to keep track of belongings. Register-based systems are often in use for “numbered” or individually identifiable elements. And account-based tracking systems, with credit and debit operations in accounts, are often in use for fungible goods. The latter system has historically been used in such cases:

⁴³⁷ Torsten Schaper, ‘Trends in European Cross-Border Securities Settlement – TARGET2-Securities and the Code of Conduct’ in Daniel J Veit and others (eds), *Enterprise Applications and Services in the Finance Industry* (Springer 2008).

⁴³⁸ <https://www.ecb.europa.eu/paym/t2s/html/index.en.html>

- The emerging banking model, that started as a safekeeping/custodian function for gold (and other valuable) and where transactions monetary transactions proved to be more practical to merely agree over the claims over immobilized gold than using the gold itself; or
- The safekeeping of physical shares, which was later also performed at the exchanges and which allowed to settle trades through merely altering bookkeeping records of claims over stocks, instead of physically shifting physical shares. This system is called immobilization. The keeping of physical shares resulted in a classification as a depository institution, a custodian or a safekeeper, with all regulatory and compliance consequences.

Many countries' company laws basically recognize one or both of these fundamental publication types to evidence the ownership and transfer of shares. Such "publication" or "evidencing" systems mainly serve as a protection towards adverse claimants, as adverse claimants need to resolve their diverse claims through alternative mechanisms (i.e. monetary damages) when their claims do not match with the information from this "publicity":

- Systems for shares where the investor can freely arrange the transition of his share, without any involvement from the issuer, nor any obligation to provide information towards the issuer regarding the transfer. This system works with bearer shares. Thus, the information of "being a shareholder" resides with the investor itself (or with an intermediary), and it allows him to manifest himself towards the company as a shareholder. In some instances, a variation of the existed under the form of negotiable or order instruments where the indicated name on the share (if indicated) could order to perform the entitled right to another person, eventually also added to the certificate. Such system of relatively readily transferable shares emerged with the Dutch East Indian Company in 1602.
- Systems for shares where the investor does not hold a physical instrument as such, or where such physical instrument/certificate merely serves as a confirmation document for a certain registry entry, but where the shareholdings are recorded in a ledger that is managed by the issuer. Only then can he manifest himself as shareholder. Thus, investors that arrange a trade need to report it to the issuer, and issuers can reach out to its shareholders directly. This system was in use with many 18th century joint stock companies, up until today in some countries. It requires the approval and registration of new shareholders in record books of the company, which in the past required in-person attendance at the company transfer office.⁴³⁹

In general, with regards to bearer securities, the rules on transfer of movables apply. In respect of transfer of registered securities, rules on assignment/registration rather apply. Also for ownership stakes in company forms that do not allow sales to third parties, should one follow the rules of assignment (those company types and their units –for instance units in a German GmbH or a German partnership– can in principle not participate in bookkeeping systems). Many company laws offer the option to choose the form of a share. For instance, in Portugal or also in France, where an investor has the

⁴³⁹ Geoffrey Poitras, *Valuation of Equity Securities: History, Theory and Application* (World Scientific 2010).

choice between the two forms of securities in a company, unless the charter of incorporation provides otherwise (Art. L. 228-1 Commercial Code; art. L. 211- 4 of the MFC).

3.3.2. A trend to dematerialized shares instead of dematerialized registers

Now, as we face the omnipresent trend towards electrification, one might consider that the intangible form (the registry-based form) would be a better fit for information systems, as the register can easily be digitalized. However, this does not take into account the path dependency. Indeed, historically, preference has mainly been given to the tangible, physical form. And it are mainly holding chains that were once based on physical shares that are now digitalized. Thus, it are immobilization systems that are dematerialized now. However, participating in such digitalized or bookkeeping system often implies the acceptance of an ownership system that among its participants deviates from the company law system.

These bookkeeping systems, registry-based versus account-based, are however interchangeable from an information theory point of view. On the basis of one information set can the other be constructed. In a register-based system, the table resembles the shareholdings of the company, while in an account-based system, the accounts resemble the holdings per participant. In fact, they can perfectly reconstructed from each other, under the condition that all shares are represented in the system.

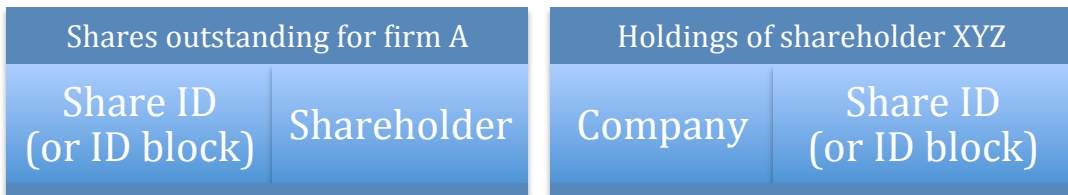


Figure 4: registry-based versus account-based database systems: not a huge difference

For this account based system, it would be important to treat the deposited/immobilized shares as commodities, and thus as fungible items. Physical share certificates or bearer shares held unique numbers (to prevent forgery and fraud by means of duplication). This fungibility was agreed on contractually with the participants, to keep track of the amount of shares with identical properties, instead of the individual shares with their individual numbers. It would be unworkable if the account holder would be entitled to the return of any specific securities. Instead, they are only entitled to the return of an equivalent amount and type of securities. This may be contractually stipulated or it may be foreseen in a state-provided legal intervention that facilitates or recognizes such bookkeeping practice on top of the generic company law ownership regime.⁴⁴⁰ Then, no individual link between the depositor and the exact deposited shares would be needed:

⁴⁴⁰ Jack I Samet, 'Concept of Fungibility in Securities Laws, The' (1971) 27 Business Lawyer 383.

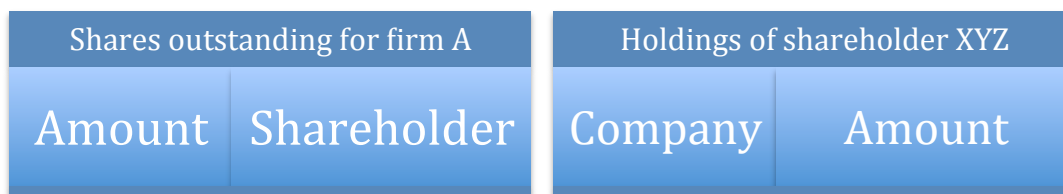


Figure 5: The effect of fungibility in register-based and account-based systems

Law- and policymakers have also another reason to facilitate bookkeeping systems, besides fostering market infrastructure: due to the fact that bearer shares were often used for secondary reason (i.e. tax avoidance and evasion), law- and rulemakers have also been looking to reduce the number of bearer shares in circulation during the past years. This led to a situation where legal intervention would not only recognize bookkeeping systems and their fungibility element but it would effectively create a trend to replace physical shares with “dematerialized” shares: namely shares that would only have an existence as account-entries, and that would skip the step to first create them as physical shares that would shortly thereafter be immobilized at an account provider. In Europe, Denmark was the first country to dematerialize securities in 1981.⁴⁴¹ Many countries followed, even with total dematerialization. For instance, France through its dematerialization Law no 81-1160, dated 30 December 1981, which codified in Article L.211-4 of the Monetary and Financial Code: all securities issued in France and subject to French Law are since then dematerialized. In fact, such dematerialized shares from the start can then not be claimed anymore or not be exported anymore from accounts. However, that also means that all other users of physical shares, who did not participate in the market infrastructure of an account provider, would now have to use such system (or would have to default to registered shares).

Thus, public equity trading in many countries has now defaulted to account-based systems for immobilized/dematerialized shares. Some central securities depositories, that organize the root accounts (towards intermediaries, that then offer accounts to end-investors) for dematerialized share issues, immobilized share deposits or global assignments of shares also simply did not offer any functionality for register-based shareholdings, under the form of dematerialized registers or not even their tradition accounts. For instance, Clearstream (Germany’s CSD) refused for a long time to supply settlement services for registered shares issues under German law. This was however considered as anticompetitive, as Clearstream was the only CSD available in that market (as in all national markets, there is currently only one CSD available) and as this refusal to supply services to this form of shares was therefore considered as a misuse of its dominant position.⁴⁴² Only about 70% of European CSDs offer services for registry-based systems.⁴⁴³ Also legal interventions to facilitate bookkeeping system deeply entrenched these account-based systems over the dematerialization of registers

⁴⁴¹ Chan and others (n 288).

⁴⁴² David Henry, ‘Clarifying and Settling Access to Clearing and Settlement in the EU’ (2006) 17 European Business Law Review 999.

⁴⁴³ European Central Securities Depositories Association, ‘Issuer Services: Report by ECSDA Ad Hoc Task Force on Issuer Services’ (European Central Securities Depositories Association 2008) <http://www.ecsda.eu/uploads/tx_doctrinary/2008_01_ECSDA_Issuer_Services_Report.pdf> accessed 5 September 2013.

instead. During the past decades, multiple countries have especially enacted rules to force this dematerialization or immobilization for exchange-traded securities, and are also moving towards full dematerialization with some lag. For instance, Greek Law 2396/1996 requires dematerialization for shares (through a national CSD) that are listed on the Athens Exchange as well as in any Stock Exchange operating in Greece. On a European level, an upcoming Central Securities Depository Regulation foresees immediate Europe-wide dematerialization for securities that participate in organized trade, and a full dematerialization by 2020.⁴⁴⁴

The central market infrastructure provider for bookkeeping securities may however offer facilities for both registered as well as physical (potentially dematerialized) shares. An example of a country where both bearer and registered shares can be considered as bookkeeping shares, is for instance Slovenia (Art. 5 of ZNVP). For registered shares, the national CSD (KDD) holds a dematerialized ledger on behalf of the issuer and in case buyers and sellers enter a transfer in a share ledger of registered shares, then pursuant to Art. 232 of Companies Act (ZGD) a notification is provided to the issuer. Also the law- and policymaker can recognize both share systems for dematerialization. France recognizes both registered and bearer shares as book-entry shares following the dematerialization law n° 81-1160 dated December 30, 1981 and as codified in Article L. 211-4 of the MFC. Some countries even consider only the registered shares as the dematerialized variety: Hungary considers materialized securities by law as registered securities.⁴⁴⁵ Or Lithuania for instance, only recognizes registered shares and those registered shares will thus be the only one the “dematerialize”.⁴⁴⁶ However, a contrarian example is for instance Belgium: companies can issue dematerialized and registered shares, compared to bearer and registered shares in the past.⁴⁴⁷ There, dematerialized shares are considered as a replacement of bearer shares but not as a grouping that entails both bearer and registered shares. Or the case of Spain, where article 9 of the Securities Market Act states that “Transfer of book-entry securities takes place by means of account transfer. The inscription of the transfer in favor of the acquirer will produce the same legal effects than the delivery of the physical securities”.

The United Kingdom, Ireland, Australia, and a number of other UK-related countries have however developed electronic market infrastructure that is only based around registry-based systems, through effectively centralizing the company-specific registers in one central information system for the participating companies.⁴⁴⁸ In Australia this system for dematerialized registers is called CHES. In the UK and Ireland, this system is called CREST. However, the Irish principle is still that the issuer’s register should be kept at the level of the issuer or his (subcontracted) registrar. In fact, centralizing the

⁴⁴⁴ Proposal for a regulation of the European Parliament and of the Council on improving securities settlement in the European Union and on central securities depositories (CSDs) and amending Directive 98/26/EC

⁴⁴⁵ European Commission, ‘EU Clearing and Settlement Legal Certainty Group Questionnaire Horizontal Answers’ (2006) <http://ec.europa.eu/internal_market/financial-markets/docs/certainty/background/comparative_survey_en.pdf> accessed 10 October 2013.

⁴⁴⁶ Ibid.

⁴⁴⁷ Ibid.

⁴⁴⁸ Antony Dapiran, ‘Replace the Clearing System’ (2008) 28 *International Financial Law Review* 36.

dematerialized registers in CREST is not possible, like in the UK. Thus, in Ireland, CREST more serves as an instrument to match seller's transfer instructions with buyer's confirmation instructions and to communicate such match with the issuer/registrar in order to update registers.⁴⁴⁹ Bearer instruments can participate in these systems, by first depositing them (in case of the United Kingdom: CREST Depository Interests – CDIs – where CREST does actually not act as the deposit taker itself, but where other actors act as depositories). Such register-based systems have the advantage that the shareholders that appear in those registers may directly exercise shareholder rights against the companies. Indeed, for corporate actions (i.e. voting, dividend distribution), such registry-based systems are much less expensive than intermediated systems that are based on chains of accounts between the CSD and an investor.⁴⁵⁰

3.3.3. Duality between book-entry and company law ownership rights

The fact that registered shares do not always allow to be included in market infrastructure does not make them unavailable. Company law may still offer them, but the transfer procedures may then also be fully subject to those under company law. Those procedures may make them unavailable to be included in such electronic bookkeeping systems that are offered by CSDs: for instance, updating the shareholder register (and thus effectively leading to “settlement”) would in many countries, like in The Netherlands, require to demonstrate a deed of transfer instead of merely sending some instructions like a dematerialized account-based system allows. Or, there are in many cases also other formal requirements under the form of a physical signature to confirm a transfer in the register (with uncertainty on a country-per-country basis about the possibilities to perform this with a digital signature), or the requirement to hold the authoritative register at the registered office of the company (a digitalized version would be non-authoritative).

And when bookkeeping systems are used among a group of participants (certainly before such systems would become compulsory), the system may deviate from the ownership information that the company law foresees. The owner that is noted in the books can possibly only exercise rights against the account provider, from a strict legal point of view. Exercising corporate rights against the issuer (the rights attached to securities) may in some situations be exercised as well. This may be through a direct recognition of the bookkeeping system under national law, or it may be through a system where the account holder relies on the cooperation of the account provider for the exercise of his rights. The depository has no right to dispose of the depositor's securities, to manage them, or to perform any actions with securities on behalf of the depositor, except for those performed on the depositor's order in cases provided for by the depository contract.⁴⁵¹

⁴⁴⁹ European Commission, 'EU Clearing and Settlement Legal Certainty Group Questionnaire Horizontal Answers' (n 445).

⁴⁵⁰ Francis Groves, *Corporate Actions - A Concise Guide: An Introduction to Securities Events* (Harriman House Limited 2012).

⁴⁵¹ Eva Micheler, *Property in Securities: A Comparative Study* (Cambridge University Press 2007).

Account-based systems have at least one intermediary between the shareholder that appears in the accounts and the issuer. However, often there are many more intermediary account providers in-between, in which case one can call it a “chain”. In some countries, there are specific regulations to follow as such intermediate account provider between the CSD and the end-investor. For instance in Germany: providing a securities account (Depotkonto) makes one subject to the accounting system applicable to banks that offer (securities) safekeeping for customers.⁴⁵² Or, in France, offering a securities account requires an authorization (except if the issuer is offering the securities account for its own shares – effectively like a shareholder registry). Only the following entities are then allowed to maintain securities accounts (Art. L. 542- 1 of the MFC): credit institutions, investment firms, or entities that are principally established to maintain securities accounts. Also in Italy is the function of a securities account inherently a function of custody of the securities, and consequently is the contract between the client and the custodian qualified as a “deposit” under Italian law.⁴⁵³

Also in case of registered shares, it is possible to have a chain if the name that appears in the register is not necessarily the beneficial shareholder – but this is then based on nominee or trust contracts rather than historical situations that implied a form of custodianship or safekeeping.

Even when a state-provided system recognizes the book-entry systems and rights, to facilitate such bookkeeping system, those rights may rather be a form of *sui generis* rights rather than replacements of the ownership rights under company law. These are than a juxtaposition on top of those ownership rights.

In fact, many countries have created special ownership regimes that take into account the market practice that is in many cases based on chained structures in account-based models. Just like some countries facilitated the fungibility element, or offered certainty regarding adverse claimants as the evidencing regime does not necessarily follow the normal company law and property law principles anymore. Without the creation of such specific ownership regimes, then it was left to the private parties to create a working mechanism with the common toolbox: for instance through contractual claims. However, if the investor would merely have a contractual claim towards an intermediary and if the intermediary would be the ultimate owner (from a property and company law perspective), then this would obviously obstruct how an end investor can exercise corporate actions. It would even create unwanted situations in case of insolvency of the intermediary, as these securities would not be segregated from his assets. In case of insolvency of the account provider, investors in Belgium are since the legal intervention protected through right to exercise a return against the pool of fungible book-entry securities in its Royal Decree 62. That pool is thus not considered as a property of the intermediary or top account provider. Another example is the Czech Republic, where section 34 of Securities Act foresees that fungible securities held in safekeeping are not effected by insolvency of the intermediary / account provider and that the liquidator is obliged to hand these securities over to the owners.

⁴⁵² European Commission, ‘EU Clearing and Settlement Legal Certainty Group Questionnaire Horizontal Answers’ (n 445).

⁴⁵³ *Ibid.*

Here follow some examples of national regimes that created sui generis ownership rights or co-ownership rights in a pool of securities, which applies for an investor towards his intermediary or potentially towards the top of the chain.⁴⁵⁴ For instance, in Belgium, Royal Decree 62 foresees a co-ownership right, which is enforceable against the intermediary with who securities are held on account while the shareholder right can be directly asserted against the issuer. In Denmark, an account holder is also considered as the owner (shareholder) against the issuer. Also in the Czech Republic the transfer of securities in books of intermediaries is also considered as a transfer of ownership of a portion of pooled securities. But also in Estonia is a transfer of a bookkeeping entry a sui generis right, namely a transfer of a bundle of rights arising from the credit entry. This principle that such book-entry securities are a co-ownership of securities that entitle the account-holder to exercise all right arising out of these securities against the issuer is also present in Germany. In fact, the list can go on. Perhaps, The Netherlands can be given as a last example where securities that are subject to the Securities Giro Transfer and Administration Act, are also co-ownership rights in collective deposits of securities.

Besides the co-ownership right in a pool of (fungible) securities which is segregated in case of insolvency of the account provider, such bookkeeping rights are also often recognized as a bundle that also includes other rights that facilitate the exercise the rights that the account holder has in respect of the securities to which the book entries relate (voting rights, dividend rights, rights to subscribe for further securities, etc.).⁴⁵⁵ The title of the interest holder is usually the book-entry and not the actual securities or interests to which it relates and the intermediary holds.

In most cases, account holders will not be recognized by owners by the top-tier account providers, and will only have a possibility to exercise their book-entry-right towards the immediate account provider. In other cases is the book-entry right valid *erga omnes* from the sole registration. Thus, although a book-entry right holder has a revendication right that becomes exercisable in the event of insolvency of the intermediary (to receive an equal quantity from the higher account-holder, or rather as a right towards the insolvent immediate intermediary that is superior to the claims of the general creditors), it does not mean that under normal operations an ownership right can be claimed to other parties than the immediate intermediary and the issuer (and towards the latter, not the book-keeping right is claimed, but rather rights that are attached to securities to which the book-entry relates).⁴⁵⁶

Also for the intermediaries, one can question how the book-entry rights towards their account holders can be interpreted. This of course only applies to situations where the account provider holds an omnibus account himself, and where the end investor does not appear in the top-book-entries. In some jurisdictions, the rights for which that the account provider appears as holder in the higher account provider can be classified as

⁴⁵⁴ Ibid.

⁴⁵⁵ Eva Micheler, 'Intermediated Securities and Legal Certainty' (LSE Law, Society and Economy 2014) 3/2014 <http://www.lse.ac.uk/collections/law/wps/WPS2014-03_Micheler.pdf> accessed 9 April 2014.

⁴⁵⁶ Randall D Guynn, *Modernizing Securities Ownership, Transfer and Pledging Laws: A Discussion Paper on the Need for International Harmonization* (International Bar Association 1996).

not being part of the intermediaries' assets and, not even under normal operations.⁴⁵⁷ This is for instance the case if the account provider acts as a nominee, when this notion is recognized. In other systems, such securities are included in the assets of the “custodian” institution that holds the omnibus accounts, for instance on a trust basis when this legal notion is recognized.

However, despite the fact that many countries have recognized and converged to a system where together with the fungibility notion a special ownership right could be created under the form of a co-ownership right in a pool of (fungible) securities, there is still no exactly identical system that is used across countries. Instead, there are very substantial differences between countries. This creates serious problems on a cross-border basis. For instance, in chain that stretches cross-border or in a situation where an issuer would decide to work with different account providers in different countries, for different issues, it might result in situations where different persons might each be considered as the legal owner towards an issuer.⁴⁵⁸ For such conflict of law reasons, the European Commission is currently preparing a Securities Law Directive.

3.3.4. Reducing coordination costs of cross-border settlement: T2S

With multiple CSDs that mainly operate on a national basis, cross-border transactions are rather expensive as the intermediary has to become a member of multiple CSDs, or as he needs the services or other (foreign) intermediaries. The participation fees, under the form of fixed and variable costs, vary widely among CSDs. Most CSDs charge a fixed general fee to participate in their system, and a specific fee per individual account. Part of the cost to connect to one or multiple CSD(s) also depends on the costs to realize a technical interface for data interchange with the CSD's computer system. Especially the fixed costs result in relatively high charges for smaller members. These costs of the intermediaries are obviously passed on to the end clients.

A discussion on different possible topologies for international clearing and settlement is not widely taking place, but over the last years, different market-driven attempts have tried to use alternative industry structure to solve the cross-border problem. In general, processing can take place in a decentralized network, or in a centralized network.⁴⁵⁹

Two CSDs have emerged that merged a number of national CSDs, and that thus progressed to a centralized approach but that could not get beyond a certain integration point: Euroclear and Clearstream. But for those that stayed national (decentralized), the account-based topology of most CSDs theoretically allows that the national CSDs would hold accounts with each other, and thereby acting as a relay/intermediary for their clients (who are intermediaries for end clients).

⁴⁵⁷ European Commission, 'EU Clearing and Settlement Legal Certainty Group Questionnaire Horizontal Answers' (n 445).

⁴⁵⁸ Pierre-Henri Conac, Ulrich Segna and Luc Thévenoz, *Intermediated Securities: The Impact of the Geneva Securities Convention and the Future European Legislation* (Cambridge University Press 2013).

⁴⁵⁹ Torsten Schaper, 'Elimination of Technical Barriers in European Securities Regulation', *Facing New Regulatory Frameworks in Securities Trading in Europe* (Intersentia 2009).

In 1997, the national European CSDs formed the European Central Securities Depository Association (ECSDA) and they proposed to expand this already existing market practice where CSDs link together.⁴⁶⁰ Initially, the idea was that each national CSD would link with every other national CSD. Thus, each CSD would have an account at every other CSD. Then, each CSD would be a gateway to every other CSD, for that CSD's participants and would be able to hold foreign securities on behalf of its participants. But with 27 CSDs in the EU, and the total number of connections to be $n*(n-1)$, this would imply 702 links ($27*26$). In practice however, substantially less links have been established. Once this proved to be unrealistic, a solution with "relayed links" was proposed. There, a CSD that had a link with to another CSD, would offer access to that link to other CSDs that were connected to it.⁴⁶¹

This model, with links between CSDs is recognized by the very high cost of the total network, since every connection between CSDs costs a considerable amount of money (for implementation, even if the link is only rarely used) and the number of links quickly goes up when the number of CSDs goes up. Also, each CSD needs to have accounts in the CSDs of the counterparts.⁴⁶² The links between CSDs are costly, as they are not standardized (i.e. not in terms of account format nor in terms of IT connectivity). That is one of the reasons why national CSDs only have created limited links with each other. There is thus a coordination problem to increase the interlinking, as it requires a form of standard setting.

This costly cross-border settlement situation can clearly be considered as a market failure, as no single market can develop. Euroclear (an international CSD) concludes that annual excess costs from the costly cross border settlement market resulted in a €5 billion figure, while the European Commission assumes that cross-border equity transactions in Europe cost two to six times more than domestic transactions and that aggregate excess costs add to €2 billion to €5 billion.⁴⁶³ Of the total costs of the different cross-border settlement channels that had been described before, ICSDs and CSDs accounted for 2.5% each, local agents for 35%, and costs related to additional back office facilities for around 60%.⁴⁶⁴ The social welfare benefits of a more interlinked infrastructure were estimated to lead to an increase between 0.2% and 0.6% of the EU GDP per year.⁴⁶⁵

However, instead of only creating new regulations to solve this coordination problem that requires standardization, policymakers actually opted for a state-sponsored

⁴⁶⁰ Linda S Goldberg and others, 'Securities Trading and Settlement in Europe: Issues and Outlook' (2002) 8 *Current Issues in Economics and Finance*.

⁴⁶¹ Lannoo (n 272).

⁴⁶² Daekeun Park and Changyong Rhee, 'Building Infrastructure for Asian Bond Markets: Settlement and Credit Rating' (Bank for International Settlements 2006) BIS Papers chapters.

⁴⁶³ Expert Group on Market Infrastructures, 'EGMI Report' (European Commission 2011) <http://ec.europa.eu/internal_market/financial-markets/docs/clearing/egmi/101011_report_en.pdf> accessed 12 December 2013.

⁴⁶⁴ Ibid.

⁴⁶⁵ Jenni Laininen, 'Restructuring the European Post-Trading Industry - A Quest for Efficient Financial Markets' (Aalto University 2011) <<https://aaltodoc.aalto.fi:443/handle/123456789/760>> accessed 15 January 2014.

solution: the European Central bank launched the Target2-Securities initiative in July 2008, to reshape the clearing and settlement business in Europe.⁴⁶⁶ The European Central Bank's project is to create a single technical platform where all CSDs can use a single technical interface (a standard) and can therefore much easier create accounts with each other. In this model, there are still national CSDs, but instead of having links between them, they all deal with one central hub. Therefore, there are only as many links as there are CSDs, and the national CSD members still only have to interface with one common technical system that will host their accounts.

For payment settlement, the European Central Bank already had experience with such model. Cash settlements virtually always rely on a topology of commercial banks that hold reserves in central bank money, and payments that take place between account holders of commercial banks that hold central bank money accounts in the same central bank, can easily settle a payment between each other through the exchange of confirmation message that eventually results in a mutation of the reserve accounts at the central bank. When banks do not hold reserve accounts a same central bank, the topology became also more complex as agents might have been needed that hold accounts at commercial banks that have reserve accounts at the same central bank where the counterparty's commercial bank participates. Another possibility could exist in the Eurozone, through interlinkages between central banks. This is specifically possible in the Eurozone especially since the central banks all use the same monetary unit; however as this would have also created substantial costs to have an interlinking (possibly requiring customized computer interfacing) of all central banks with each other, this was initially facilitated through central communication and settlement with a "hub" model where every central bank was connected to the same platform. That platform was managed by the European Central Bank under the name "Target".⁴⁶⁷ However, soon after, it was replaced by a hub/platform system where also commercial banks could connect to: the resulting Target2 system is open to 1000 European direct participants and gives access to more than 3000 worldwide banks.⁴⁶⁸ One of the reasons for the very high connection rate, is the use of internationally used SWIFT FIN and XML message interchange standards. Therefore, Target2 was fully interoperable with already existing market standards, systems and functions.

The background of adopting such similar model, as the Target and Target2 models, must be seen under the existence of two models of securities settlement provider, depending on their function in the cash settlement system as well: namely an outsourced model in some countries (whereby security and cash movements takes place by the same actor/CSD and where that CSD thus has the authority to control some payments on the books of a central bank), and with a non-outsourced model (a CSD is not authorized to manage the money, and thus the central bank also has to manage the securities). The Target2-Securities System decided for a system where the CSDs would transfer the securities balances and outstanding transactions to the central hub. That central system is in connection with the already existing Target2 platform to allow

⁴⁶⁶ Chun (n 433).

⁴⁶⁷ Yutaka Kurihara, Sadayoshi Takaya and Nobuyoshi Yamori, *Global Information Technology and Competitive Financial Alliances* (Idea Group 2006).

⁴⁶⁸ Philip Brown, 'TARGET2-Securities: A Platform for Solving Some of the Key Structural Issues Raised by the Financial Crisis and Its Aftermath' (2013) 6 *Journal of Securities Operations & Custody* 122.

smooth “Delivery versus Payment” (DvP), which reduces the counterparty risk between the two settlements (securities and payment).⁴⁶⁹ Before, links between national CSDs often only supported “Free of Payment” (FoP) settlement, where there existed a danger that the cash settlement would fail. As a result, such connections were used very little in practice (free of payment is of course still possible under the Target2-Securities platform). There are however exceptions: Euroclear and Clearstream are for instance also licensed as banks: at the moment of a transfer of securities, the account balance of the buyer’s account is debited and the seller’s account is credited. The payment thus already happens in-house and against the transfer securities.⁴⁷⁰ And besides managing simultaneous payment streams, there may also be arrangement that use lending facilities with a settlement bank. Also, as many instructions are initiated by a CCP clearinghouse (for exchange transactions), that entity dispatches securities settlement and the payment settlement instructions simultaneously, or even uses margin deposits to settle some obligations in-house.

Although CSDs are not under an obligation to participate in the Target2-Securities project, 23 national CSDs have signed up.⁴⁷¹ A principle of the T2S platform is that it will be account-based (as described earlier, and as compared to dematerialized registry systems – CREST from the UK will therefore not participate⁴⁷²) and that securities accounts will be kept on T2S and will be attributed legally to each CSD. Thus, CSD will still be able to open, maintain or close accounts for itself or for its members in the system. Thus, the CSDs that join T2S must outsource settlement to T2S and allow it to make changes and modifications in the balances of accounts for which they are responsible. Another principle is that it requires the CSDs to delegate management of securities and cash accounts to central banks.

A substantial problem is however that existing CSDs have announced an increase in fees that they will charge to their members, for the added costs to participate in the Target2-Securities system.⁴⁷³ Thus, instead of making the market infrastructure more accessible, the threshold becomes higher. This is especially problematic for small and growth firms.

The United States has an alternative way to coordinate: namely a single CSD that provides services to the entire market. The Depository Trust Company provides settlement services for different US markets. Initially, this was however under the form

⁴⁶⁹ Michel Tison and others, *Perspectives in Company Law and Financial Regulation* (Cambridge University Press 2009).

⁴⁷⁰ Wood, *Set-Off And Netting, Derivatives, Clearing Systems* (n 432).

⁴⁷¹ François Dubrau, ‘CSD Regulation: A Major Change for the Post-Trade Arena’ (2014) 6 *Journal of Securities Operations & Custody* 212.

⁴⁷² Jeremy Grant, ‘UK Turns down ECB Securities Project’ *Financial Times* (21 July 2011) <<http://www.ft.com/intl/cms/s/0/03b6fd5a-b06f-11e0-a5a7-00144feab49a.html#axzz34jiY5UUj>> accessed 15 August 2013.

⁴⁷³ Sophie Baker, ‘CSD Giants Ask Clients to Help Cover T2S Investments’ <<http://media.efinancialnews.com/story/2012-12-24/csd-t2s-settlement-costs-euroclear-clearstream?ea9c8a2de0ee111045601ab04d673622>> accessed 16 January 2014; Robert Almanas, ‘T2S: Time to Seize the Day’ <<http://www.bankingtech.com/179681/t2s-time-to-seize-the-day/>> accessed 15 January 2014.

of the Depository Trust Company (DTC) and National Securities Clearing Corporation (NSCC), which were later combined to the DTCC holding company (in 1999).⁴⁷⁴

3.3.5. Increasing competition for securities depositories

Besides, or parallel to the (non-compulsory) Target2-Securities coordination project from the European Central Bank, the European Commission already indicated in 2004 that it would adopt a high level directive to provide a common regulatory and supervisory framework for securities clearing and settlement, to improve the cross-border problem.⁴⁷⁵ However, this would be dropped in favor of supporting a self-regulatory approach. This self-regulatory approach initiated a theoretical route to create links between CSDs, as discussed above. In November 2006, CSDs signed a Code of Conduct validated by the European Commission.⁴⁷⁶ Price transparency, freedom of access, interoperability and non-discriminatory access the key commitments in this code. The implementation of the Code consists of three phases: implementation of price transparency, access and interoperability, and service unbundling and it was finalized in 2007.⁴⁷⁷

However, I already mentioned that this code failed to create linkages and it did also not particularly create a route for welcoming new entrants to increase the competition between CSDs. Such competition could lead to cross-border entities, but only two emerged in reality (and they were even logically organized as an umbrella entity over national CSDs).

It was only by 2008 that the Commission would reconsider a lawmaking approach, with a request to CESR to identify regulatory arrangements for post-trading infrastructures and to advise on possible solutions for the cross-border problem set.⁴⁷⁸ On an institutional level, the choice between improving the cross-border settlement situation seemed one between further price and access regulation, or forcing trading platforms to divest their stakes in CSDs. As the former one would have been difficult to control, the latter option was more likely.⁴⁷⁹

And recently, on 7 March 2012, the Commission adopted a proposal for a Regulation on improving securities settlement in the European Union and on central securities depositories (CSDs) and amending Directive 98/26/EC. This Regulation introduces the

⁴⁷⁴ Chun (n 433).

⁴⁷⁵ European Commission, 'Commission's Communication to the Council and the European Parliament Entitled "Clearing and Settlement in the European Union - The Way Forward"' (n 436).

⁴⁷⁶ Schaper, 'Trends in European Cross-Border Securities Settlement - TARGET2-Securities and the Code of Conduct' (n 437).

⁴⁷⁷ Schaper, 'Elimination of Technical Barriers in European Securities Regulation' (n 459).

⁴⁷⁸ European Commission, 'Formal Mandate to CESR for Technical Advice on Identifying Regulatory Arrangements for Post-Trading Infrastructures and Advising on Possible Solutions in Terms of Bridging Any Potential Differences in These Arrangements' (28 July 2008)

<http://ec.europa.eu/internal_market/financial-markets/docs/clearing/2008_07_28_cesr_mandate_en.pdf> accessed 11 January 2014.

⁴⁷⁹ Lannoo and Levin (n 434).

hub and spoke or passporting principle for CSDs, and it thus opens cross-border competition. Also, the Regulation introduces an obligation of dematerialization for most securities, harmonized settlement periods for most transactions in such securities, settlement discipline measures and common rules for CSDs.

An additional driver to regulate actors like CSDs now also exists under the form of addressing systemic risks. After all, since most of the financial instruments start to trade via such infrastructural systems, the effects of an obstruction or an unorderly winddown of a settlement provider, would have far-reaching implications. Besides that, they are also excellent information tools to monitor the processes in the market as they effectively have the complete market of many types of securities on their books.

Also besides such initiative to tackle the institutional settlement setting, in order to allow competition and new entrants, there are still plans for initiatives that need to improve the substantive law for cross-border securities movements. For instance, a potential Securities Law Directive where a harmonized regime should regulate the legal framework governing the holding and transfer of securities held through accounts, as well as the treatment of rights flowing from securities held through such accounts.

Previously, with merely country-specific regulations for CSDs, and with interlinks that were too expensive to realize, CSDs still only focused on their national markets where they had a monopoly. And although the Target2-Securities initiative will improve the cross-border settlement of securities, it does not create competitiveness as such between account-providers/CSDs. Many national rules effectively restricted the issuer's ability to choose the CSD for its issue process, and firms therefore effectively had to issue shares to such a national CSD monopoly holder. Such non-competition is not necessarily in the best interest of the participants and the issuers (as CSDs can charge monopoly rents). Therefore, the CSD regulation opened the possibility to have competition on a European level in this domain. This should then prevent the situation where CSDs can charge monopoly rents without losing market share. But too much competition and duplicate costs is in fact also not desirable – it is thus expected that a number of large cross-border players will emerge in this industry that is after all recognized by economies of scale.

While more competition can prevent monopoly rents in the market, the cost reduction objectives of the upcoming CSD regulation are not present on all levels. An important aspect of the upcoming regulation is that it very much entrenches the market practice accounts for dematerialized shares, instead of dematerialized registers. Such dematerialized shares have a history of deposit-takers, safekeepers and custodians instead of merely information or technology providers. Thus, it entrenches a much more compliance-costly model. As discussed above, account-based systems require the intervention of intermediaries. This higher cost is then passed on to the end-users and it ultimately increases the threshold for small firms that also want to use such infrastructure (certainly for its connection with other infrastructure like trading infrastructure). Dematerialization was initially based on immobilization of physical shares that needed depositing. That required rules that considered the notion of safekeeping and custodian. Due to path dependency, the regulatory needs for intermediaries in the chain between a CSD and an end-investor or issuer still requires such heavy compliance regimes, despite the fact that they are now merely account

providers (merely an information technology function) and that they do not necessarily keep valuable items anymore.

Under the harmonized CSD Regulation, which is thus very suggestive for the dematerialized share system instead of the less demanding dematerialized register system, these core services define a central securities depository as an actor that performs at least the settlement service plus one other service (notary service, or top account provider):⁴⁸⁰

- Initial recording of securities in a book-entry system ('notary service');
- Maintaining securities accounts at the top tier level ('central maintenance service');
- Operating a securities settlement system ('settlement service').

'settlement' means the completion of a securities transaction with the aim of discharging the obligations of participants through the transfer of funds or securities;

'securities settlement system' means a system under the first and second indents of point (a) of Article 2 of Directive 98/26/EC whose business consists of the execution of transfer orders as defined in the second indent of point (i) of Article 2 of Directive 98/26/EC;

'securities account' means an account on which securities may be credited or debited;

'transferable securities' means transferable securities as defined in point (18) of Article 4 of Directive 2004/39/EC;

Another disadvantage of entrenching account-based systems over register-based systems, is that such systems basically break the direct link that could otherwise exist between a company and its shareholders. This account-based system may be particularly good for secondary markets, but it is not particularly good for companies/issuers. For an issuer, it puts him in a situation of dependency, where he gets little insight in his shareholder base. Considering the path dependent development of CSDs, namely as facilitators for physical shares where the issuer would not have insight in the transactions anyway, this is understandable. If the CSD does however maintain the central register (it is only an ancillary service under the upcoming Regulation), then this CSD maintenance of the central register is to be distinguished from the CSD notary service, as this (outsourced) registry function is the function of maintaining the "central" register, while the notary function is for "entering" a particular issue's shares in the top tier of the account-based settlement system.

Register-based share systems are thus friendlier in terms of notification towards the issuer, and are more cost-effective for corporate actions.⁴⁸¹ For instance, cross-border voting is much more cost-efficient, as it does not require the cooperation of many intermediaries.⁴⁸² In such systems, shareholdings towards the issuer can be highly transparent, except if shareholders use nominee or trustee holder structures. For instance, the UK settlement system, CREST, is a direct holding system. This means that

⁴⁸⁰ Proposal for a Regulation on improving securities settlement in the European Union and on central securities depositories (CSDs) and amending Directive 98/26/EC

⁴⁸¹ Groves (n 450).

⁴⁸² Christiane Hölz, 'Barriers to Shareholders Engagement' (The European Federation of Financial Services Users 2012) <http://www.eurofinuse.org/fileadmin/user_upload/documents/Research_Reports/FINAL_Barriers_to_Shareholder_Engagement.pdf> accessed 3 March 2013.

participants in CREST can hold their securities directly from their issues, and not through an intermediary.⁴⁸³ In reality however, in such systems the securities may still in many cases be recorded on an indirect basis for beneficiary clients, through nominee and trustee notions. But at least, these are not depositories or custodians.

This lower recognition of issuer-friendly registry-based systems in the CSD Regulation, despite their advantages for issuers, is also reflected in the design choices of the Target2-Securities platform. In the T2S platform, registration details should be passed on completely outside T2S. T2S should not contain information serving the registration process that is not relevant for settlement.

In many cases, CSDs thus put issuers in a position of dependency, instead of acting as a facilitator for them. For that reason, some countries correctly consider the national CSD as an intermediary itself (Denmark for instance).⁴⁸⁴ Such setup of course greatly reduces the operational burden for the intermediaries that participate in the CSD system as they can use the market practice of omnibus accounts. One of the effects is that CSD systems in many countries also are not required to hold information about the end investor in their accounts – and even if a transparency requirement exists in some circumstances then it would imply a manual request that travels up from the CSD via intermediaries up to the end intermediary. Still, some CSDs forbid the use of omnibus accounts and even require from its intermediaries to disclose information on the end investor.⁴⁸⁵ Effectively, intermediaries are then more technical gateways than sub-account providers. Indeed, in transparent systems like Sweden, Finland and Greece, the national law considers the CSD as the sole securities account provider and under such systems, all intermediaries are considered as transparent service providers which intervene in the management of the account of the end investor at the level of the CSD but these intermediaries are not considered as account holder nor account provider.⁴⁸⁶ Denmark has a hybrid model where the intermediary can act as account manager, or where an omnibus account can also be held. However, even if a name of an end investor appears in the books of a CSD, it does not inherently mean that this end investor would have rights against the CSD as he is not necessarily in a contractual relation with that CSD (for instance, in the United States, a third party whose name may appear on an account has no rights under DTC's Rules). CSDs exist where end investors can even directly manage an account, without the need for an intermediary, and where they can have rights against the CSD itself (due to the direct contractual relation): in Denmark for instance, substantially large end-investors can directly interact with the CSD.⁴⁸⁷

But irrespective of transparency mechanisms, I have highlighted that it might still be possible to have nominee shareholders in the book-entries. Some countries or CSDs also have look-through mechanisms in place to have insight into this, or at least

⁴⁸³ Micheler, *Property in Securities* (n 451).

⁴⁸⁴ European Commission, 'EU Clearing and Settlement Legal Certainty Group Questionnaire Horizontal Answers' (n 445).

⁴⁸⁵ Ibid.

⁴⁸⁶ Ibid.

⁴⁸⁷ Jan Hellström, 'Electronic Securities: The Introduction of an Electronic Registration and Settlement System for the Norwegian Securities Market' in John Impagliazzo, Per Lundin and Benkt Wangler (eds), *History of Nordic Computing 3* (Springer 2011).

notification mechanisms to be aware when a seemingly legal owner in fact merely acts for another beneficial owner.⁴⁸⁸

Some countries, like Greece, Latvia and Finland, require that an account opener in an intermediated system indicates if he acts as final investor or as nominee, without requiring to actually give information about the final investor then.⁴⁸⁹ Sometimes, for instance in Greece and Luxembourg, national money laundering or other national transparency requirements, may allow that the intermediary performs a query about the ultimate identity (if it was indicated that one acted as nominee, or even if there was no obligation to indicate this).⁴⁹⁰ In some cases, issuers can even mandate registration in the name of the end investor, or impose limits on registration in the name of an intermediary. Indeed, issuers have an interest in shareholder (or end investor) identification, to know who is entitled to vote at a general meeting and to encourage long-term share ownership (by, for example, granting extra rights to shareholders that hold positions for a significant period of time).

While most CSDs require no transparency, France, Slovenia and Lithuania are however examples where details of the end investor must be communicated, if someone acts as a nominee or another fiduciary capacity.⁴⁹¹ Also in Slovakia for instance, when a trade has been closed the instructions must include details on the seller, the beneficial owner or on the actual buyer (although their identity in settlement instruction is represented by certain numbers from which it is not possible to identify final investors).⁴⁹²

This issue of transparency was addressed by the Task Force on Shareholder Transparency, who analyzed shareholder visibility in European cross-border situations and presented its final report in March 2011.⁴⁹³ Besides a description of decentralized and centralized models for exchanging shareholder information, it also contains a number of proposals:

- A proposal for a disclosure request/response message standard to be considered by the ISO community;
- A proposal to amend the Transparency Directive to facilitate exchange of shareholder information on a cross-border basis;
- A proposal for market practices for exchanging shareholders' disclosure requests and responses (including an arrangement for cooperation between CSDs).

⁴⁸⁸ European Commission, 'EU Clearing and Settlement Legal Certainty Group Questionnaire Horizontal Answers' (n 445).

⁴⁸⁹ Ibid.

⁴⁹⁰ Ibid.

⁴⁹¹ Ibid.

⁴⁹² Ibid.

⁴⁹³ T2 Advisory Group, 'T2S Task Force on Shareholder Transparency Final Report and Recommendations' (ECB 2011) <https://www.ecb.europa.eu/paym/t2s/progress/pdf/subtrans/st_final_report_110307.pdf?df4de2ade84dec967ba2b3902a51d9d2> accessed 22 April 2013.

3.3.6. Conclusion: a double marginalization problem

Just like the trading infrastructure, this post-trade infrastructure became optimized towards the secondary trading setting, at a cost for the primary market. CSDs do merely have an interest in primary market services to fuel their main market: namely the secondary market.

The conclusion for many SMEs is thus very much a situation of “ineligibility” to use the ecosystems and the market infrastructure. It is prohibitively expensive, also due to the numerous intermediaries that are present. Firms are now stuck with the procedures under company law, which are not always a good fit for the information age.

On top of that comes the situation that many startup companies choose for cheap company types, which are inevitably closely held company types or flexible company types. These companies are marginalized twice, as these don't have the type of units that can have access to the electronic settlement systems. These units are often not considered as shares or securities as such. Just like it has been highlighted earlier that those company types are also not allowed to do public promotions.

4. Conclusions and recommendations

Open calls thus use open market mechanisms instead of networking mechanisms. They are more cost-effective to deal with a large group of potential investors, than dealing with potential investors one by one. But this promotion mechanism is recognized by very polarized regulations, and by prohibitive compliance costs if the open/public route is chosen. This is out of reach for SME's, especially technology-driven firms that start small. The balance between protecting market confidence and offering firms access to finance is not proportional to the normal growth path of such a firm. A recommendation may be to change the “one-size-fits-all” securities regulation regime towards a more staged compliance regime. The information production standard that now applies as soon as any public open market promotion is used, is overly general and supposes both homogenous firms and homogenous investors. And just like not all firms are big corporations, so are not all investors purely driven by strict return objectives. Crowdfunding demonstrates for instance that some investors even consider their participation as a membership in something positive. State-provided standards should leave some room for the differentiation that exists in the market. One way to offer such differentiation, and to offer private agents a choice among standards that can best fit their needs instead of only having to conform to one homogenous standard, may be through global or European regulatory pluralism.⁴⁹⁴ Today, a country's securities laws and rules on financial promotion apply as soon as a capital call is made on the country's territory – which virtually happens automatically in case of internet-based capital calls. This principle only changes if a European passport is obtained, but this requires a costly prospectus on the basis of the European rules from the Prospectus Directive. Instead, for the thresholds where that Prospectus Directive does not yet apply (which is, below

⁴⁹⁴ Ralf Michaels, 'Re-State-Ment of Non-State Law: The State, Choice of Law, and the Challenge from Global Legal Pluralism, The' (2005) 51 Wayne Law Review 1209.

€5 million), a system like in company law and consumer law could offer a choice among regulatory regimes. Firms can choose the regulatory regime of a country of implantation/registration, and then leave the choice to counterparties to contract with them or not and to be subject to the rules that the firm selected for its implantation.

And besides independent ad hoc approaches, firms and investors are thus also helped by infrastructure that brings them together. Especially the internet offers new and improved ways to create such infrastructure. However, infrastructure has in the past been heavily intermediated, and this intermediated access has also been entrenched in regulations. As a result, existing infrastructure is more conducive in the interest of investors and intermediaries, but less in the interest of firms. Also regulations have made a sharp distinction between brokerage/intermediation activities and between the exploitation of a platform, but the exploitation of a platform always implicitly assumed that intermediaries would be connected to it instead of investors and firms directly. Despite the upcoming enrichment of platforms types under MiFID II, there should also be more attention to allow platforms to be of a direct access nature. That would offer more regulatory support for the private initiatives that want to use the possibilities of the internet to create conducive platforms for investors and firms.

Also, the emergence of more platforms would lead to more fragmentation in a market that is normally recognized by positive network effects. To prevent the destruction of these network effects due to fragmentation, a level of interfacing between different platforms may be desirable: a form of consolidation interconnectedness.⁴⁹⁵ Trading venues should indeed strive to a design that allows interconnectedness to minimize the fragmentation problem, by way of integration (stacking in fact). But market did not develop such form of interlinking organically, but the state can certainly impose a form of standardization to encourage a level of interconnectedness. This is what happened in the United States, where non-matched trades can be consolidated at the listing venue, but where an intermarket system can also serve as an entry point. It can also be useful in Europe to have such central consolidation point and to come to infrastructure that links across various markets.⁴⁹⁶

Fragmented trading, fundraising and listing venues are not the only domain that can be helped by a higher degree of interconnectedness. Enabling regulations to simplify interoperability and integration also have their function in the domain of post-trade infrastructure. Indeed, the European lawmaker and the European Central Bank are deploying a standardization effort in this domain. However, the type of interlinking that will result out of it will not reduce the threshold for SMEs, to use such infrastructure. More attention should be given to include those firms as well, as it can have a cascading effect: other infrastructure (trading and listing infrastructure) becomes then more accessible for them as well. One way to make this post-trade infrastructure more accessible for SMEs is to stimulate dematerialized registry-based systems, as dematerialized registers do not require the costly intermediation chain that dematerialized shares require. Such systems are for instance more cost-effective for cross-border corporate actions like voting, as the information between firms and

⁴⁹⁵ Fabrice Demarigny, 'An EU-Listing Small Business Act' (2010) ECMI Research Report <<http://www.eurocapitalmarkets.org/node/455>> accessed 10 October 2013.

⁴⁹⁶ Charles Goldfinger, 'ISD II Directive Debate about the Trading Venue Diversity' (2003) ECMI Research Report <<http://www.eurocapitalmarkets.org/node/151>> accessed 12 January 2014.

shareholders needs to travel via less (or no) intermediaries. Some standard setting may be necessary to use efficient communication methods for such corporate actions.

Of course, also complementary services may be fostered. There is for instance a lack of appropriate research coverage for SMEs. Information is a common good, and private parties do not produce it adequately. The suggestion to foster research for publicly traded SMEs was also suggested in the recent report to ESMA on Helping Small and Medium Sized Companies Access Funding (ESMA/2012/SMSG/59).⁴⁹⁷ One of the major problems in SME markets, is indeed the end of investor research for such firms, which is highly necessary due to their risk characteristics and their heterogeneous nature. Such companies with no or little track record expose the most asymmetric information and should be most helped to foresee information. This lack of research was partially a result of the move towards electronic trading. With traditional brokers, before the internet era, interaction with a broker still relied on some human element that allowed to promote (often by telephone calls) small cap stocks. Research could then be used as element to back up their claims. Of course, there was also a downside to this, as it was also a clear example of agency problems: namely the agent that tried to convince the principal, while potentially holding back information.

⁴⁹⁷ Available online at <http://www.esma.europa.eu/system/files/2012-smsg-59.pdf>

**Part 3: Individualized contracting for financial resources,
hindered by entrenched legal standard infrastructure for
coordinated situations**

A third part will look at direct and indirect investor-investee relationships. This supposes the situation where counterparties have been found, but where the contracting step still needs to take place. This part has a slightly reverse mindset than the previous and the next part. In the previous and next part, the existence of unaddressed coordination failures is highlighted, together with market initiatives to address them. Those market initiatives are then insufficiently supported in the legal infrastructure. This part however tackles situations where the lawmakers have foreseen a mechanism to reduce coordination costs, namely the state-standard of corporations and its common equity instrument to deal with large crowds of (potential) investors. This entity type specifically caters to situations where individual investors might not have negotiation power when a large number of investors are sought for which individual negotiations would result in a prohibitively expensive accumulation of transaction costs. However, reality proves that this structure is also heavily used in situations where investment terms are negotiated (with only a small number of parties involved), where the transaction is embedded in a social network and where parties can obtain information. Then, the transactional design often results in an outcome that is partially dictated by traces of the state-provided standards, while parties may actually come up with more suitable arrangements for their need if they had the full freedom. Here it is thus rather the availability instead of the lack of coordination mechanisms that hinders private mechanisms from emerging in the market. Or rather, it is rather the rigidity of a standard, and the lack of any form or differentiation that poses problems.

This corporate standard specifically anticipated post-transaction problems between investors and investees that are known as agency problems. But this is a theory that especially applies to replaceable management that does routine jobs, and it applies less to innovative entrepreneurs. Also, this theory is especially relevant in case equity is used instead of debt. Equity gives right to a residual claim only, and increases the exposure to opportunistic hazards. State-provided corporate regimes have provided protection mechanisms to prevent market breakdown when one would not be able to negotiate individual protections against such opportunistic hazards. Equity investments are today the gold standard when investing in technology-driven firms, even when the circle of investors is so small that individual negotiation is possible. However, more flexible investment types may be better suited for investments in technology-driven firms, when such level of individual negotiation is possible. These may be instruments that go beyond the polarized choice of debt and equity that has been embedded for two centuries in various laws and regulations. Hybrid investment avoid some equity-related problems like valuation issues, and avoid the problem that one needs to find a buyer in the secondary market to obtain a return (unless one holds equity to have a real option in acquiring the firm, as a complimentary resource). However, existing regulatory infrastructure tries to force those instruments into debt or equity classifications. This low level of support is costly and different interpretations create heavy uncertainty.

Equity is also the standard to invest in venture capital funds – which are effectively blind pools that are fully controlled by an additional level of managers and with an additional degree or potential for opportunistic hazards. It is a stacked use of corporate principles: namely full delegation to a manager – a mechanism that would be suitable when many participants would be involved to solve coordination costs. However, unbundled investment models may better serve a setting with a low number of

participants. Such settings allow a reduced role and mandate of the managers, which certainly do not need to have full discretionary powers. Such settings allow that investors have much more involvement in the selection and potentially also the management. However, jurisdictions with legal infrastructures that concentrate around corporations are particularly inflexible to welcome such customized models.

1. Investor-firm relationship

Given the limited focus of this study, namely to focus on technology driven firms, this study mainly considers investments through equity instead of debt. Equity is deferrable and residual. It is therefore the investment instrument of choice for such firms that face a substantial amount of external uncertainty. Debt servicing –at least standard debt with fixed returns– may create an excessive amount of stress or at least a risk for bankruptcy for such firms. Debt may also simply not be available to such firms as there may also be factors that prevent lenders to offer loans: for instance a lack of tradable assets or a lack of personal guarantees. Although in theory, the availability of venture capital backing and intellectual property can serve as a substitute for such criteria.⁴⁹⁸

Hereafter I first give a short historical development of the corporation and the standard equity investment instrument. As a residual instrument, equity implies an inherent conflicting interest as the ones in control can expropriate wealth from the residual claims that the investors ultimately have and one can in fact already profit from the initial amounts of money that have been made available by the investors before they are even invested into projects (instead of merely waiting to expropriate returns that have been generated from projects). The so-called agency problems that are caused by the separation of ownership and control have received wide academic and non-academic coverage. A seminal work is for instance *The Modern Corporation and Private Property* by Adolf A. Berle and Gardiner Means, which focuses on widely dispersed public shareholding (where customization of the equity investment is not at hand, and where everybody is a common equity holder).⁴⁹⁹ As it is not always possible to differentiate upfront between the managers that will be able to perform well and those that will enter into self-dealing, the market may break down. For that reason, state-provided corporate regimes have foreseen standard protections for equity holders that may lack due diligence and negotiation possibilities. In many ways, the corporate form is a standard contract.⁵⁰⁰ This lack of due diligence and negotiation power may be the result of the large number of investors – the accumulation of individual transaction costs would be excessive. One standard set of terms that is acceptable for the whole group is then cheaper from a transactional point of view. By overcoming a collective action problem, the state has provided a mechanism that allowed for investors and investees to contract swiftly and instantly. And although this expropriation risk still exists in the relationship between an investor and an entrepreneur, it should generally

⁴⁹⁸ Darian M Ibrahim, 'Debt as Venture Capital' (2010) 2010 University of Illinois Law Review 1169.

⁴⁹⁹ Adolf Augustus Berle and Gardiner Gardiner Coit Means, *The Modern Corporation and Private Property* (Macmillan 1932).

⁵⁰⁰ Joseph A McCahery and Erik PM Vermeulen, *Corporate Governance of Non-Listed Companies* (Oxford University Press 2010).

be understood that it may be inadequate to still call an entrepreneur in an innovative firm an agent: his ideas drive the venture and he is much less replaceable than scientific management in traditional industries. This understanding may also require a move away from the rigid corporate thinking.

After this historic overview, I will describe market-driven governance mechanisms that have emerged to protect against agency problems, both in standardized settings (particularly interesting for anonymous investors without negotiation or due diligence possibility) and in negotiated settings. In negotiated settings, they are often added to the state-provided standard protections. This creates a high level of control for the investors. Often even an excessively high level. However, for fully negotiated settings, a departure from standard debt and equity may offer advantages. I will discuss hybrid instruments that fit between equity and debt, and which may have lower exposure to expropriation problems by design. This can be obtained by repayment obligations with less room for discretion and opportunism. I will however discuss the unsupportive role of the legal system to accommodate such instruments. This will ultimately lead to a recommendation to allow more market-driven freedom, instead of forcing all activity into a rigid standard.

1.1. The emergence of corporations and the equity investment instrument

1.1.1. *The history of joint undertakings (companies)*

Even without the support of state-provided rules, simply a level of trust (i.e. in a community) already creates a stable environment to cooperate with partners towards a joint goal or a joint undertaking, and to trust on their cooperation. For that, the personal identity of that partner is important, and he or she is not simply replaceable. Kindship and close personal relations were and are very important in such structures.⁵⁰¹ This is also understandable, not only from a trust perspective to form the structure, but also for the governance, as there may be a joint liability for debts and obligations that partners can bear. After all, each individual party has equal control over the assets but they also share equally in profits and losses (possibly caused by others).⁵⁰² Especially for craftsmen businesses or for merchants that did not need external capital, such partnership allowed to undertake jointly owned and operated operations, or to make ad hoc arrangements. They work best when they involve partners with similar talents and who make similar contributions.⁵⁰³ Such multi-ownership structures were and are typically organized in an egalitarian way, instead of a hierarchical way.

⁵⁰¹ Poitras (n 439).

⁵⁰² See for instance the writings of Fama and Jensen: Eugene F Fama and Michael C Jensen, 'Separation of Ownership and Control' [1983] *Journal of law and economics* 301; Eugene F Fama and Michael C Jensen, 'Organizational Forms and Investment Decisions' (1985) 14 *Journal of financial Economics* 101; Eugene F Fama and Michael C Jensen, 'Agency Problems and Residual Claims' (1983) 26 *Journal of law and Economics* 327.

⁵⁰³ Ernst and Bleeke (n 191).

These principles would also be the fundamentals for the *societas* in medieval Italian city-states. These would evolve into structures with more flexibility, namely the *commenda* and the *compagnie*.⁵⁰⁴ The partnership model has indeed existed much longer among merchants, and the full historic chain is only limited by the availability of historic recordings. But in writings like the Treviso Arithmetic (1478) and Chuquet's Triparty (1484), the concept of a company as a partnership of merchants already appeared.⁵⁰⁵

Already in Ancient Rome, there existed such small business entities.⁵⁰⁶ The *societas* could associate partners (*manceps*) to undertake activities.⁵⁰⁷ As the concept of a legal entity did not yet exist, all partners acted as counterparty for any contract entered into by such *societas*. Other partners (*socii*) could serve as collateral for such contracts.

Even today, contract law or even reputational mechanisms that are embedded in a social network offer the possibility to operate egalitarian partnerships. Contract law only offers generic legal sanctions and third party enforcement. In some cases, default or mandatory partnership provision may step in, if private parties have an arrangement that can be qualified as a partnership agreement to which such default or mandatory rules apply. For instance, from 1844 onwards in the UK it had been mandatory for partnerships with more than 20 partners to become a company – a limit that has now been removed.⁵⁰⁸

1.1.2. *The history of jointly owned undertakings, with passive and active participants*

Besides the merchants of which the identity was important in a partnership, and who could not be replaced without the acceptance of all partners, there was already a variation accepted in France and Italy during the Middle Ages (but not before the 13th century). That variation also included partners who purely had a financing role but

⁵⁰⁴ CE Walker, 'The History of the Joint Stock Company' (1931) 6 Accounting Review 97; John H Pryor, 'The Origins of the Commenda Contract' (1977) 52 Speculum 5; Maria Brouwer, 'Managing Uncertainty through Profit Sharing Contracts from Medieval Italy to Silicon Valley' (2005) 9 Journal of Management & Governance 237.

⁵⁰⁵ Edith Dudley Sylla, 'Une Arithmétique Commerciale Du XVe Siècle: Le "Compendy de La Praticque Des Nombres" de Barthélemy de Romans.' (2005) 96 Isis 429.

⁵⁰⁶ Henry Hansmann, Reinier Kraakman and Richard Squire, 'Legal Entities, Asset Partitioning, and the Evolution of Organizations'

<http://www.law.harvard.edu/programs/corp_gov/papers/Hansmann_Paper.pdf> accessed 20 February 2014; Henry Hansmann, Reinier Kraakman and Richard Squire, 'Law and the Rise of the Firm' (2006) 119 Harvard Law Review 1333; Barbara Abatino, Giuseppe Dari-Mattiacci and Enrico C Perotti, 'Depersonalization of Business in Ancient Rome' (2011) 31 Oxford Journal of Legal Studies 365; Ulrike Malmendier, 'Law and Finance "at the Origin"' (2009) 47 Journal of Economic Literature 1076.

⁵⁰⁷ Andreas M Fleckner, 'Corporate Law Lessons from Ancient Rome'

<<https://blogs.law.harvard.edu/corpgov/2011/06/19/corporate-law-lessons-from-ancient-rome/>> accessed 20 February 2014.

⁵⁰⁸ John Flood, 'Megalaw in the UK: Professionalism or Corporatism—A Preliminary Report' (1988) 64 Indiana Law Journal 569; Denis J Keenan, *Smith & Keenan's Advanced Business Law* (Longman 2000).

whose capabilities or identity are otherwise of no interest to the partnership or to those who deal with the partnership. Those investors with a financing role enjoyed a limitation of liabilities and commitments that had been taken up by controlling partners: the concept of the limited partnership dates at least as far back as twelfth-century Italy, where it was known as a *commandita*.⁵⁰⁹ In France, the structure was called the *société en commandite simple*⁵¹⁰, and was for instance particularly in use in capital-intensive activities like maritime activities. One or more seamen would partner with a financier (a bourgeois or noblemen, who did not lose his nobility by participating in a financing capacity only instead of a merchant capacity). Those delivered capital or capital intensive assets that the seamen could use for the undertaking. In return, they would participate in the profits of the sea voyage. This financier could only lose these assets or capital if the undertaking failed. At that moment, this was one of the few systems to work with capital-intensive assets or activities, as lending against interest was forbidden under Catholic rules. Financiers thus had to participate in the risk, and shared the upside.

Such *commandites* thus have two capacities among their members: the merchants whose personal capacity and identity is important and who run the undertaking, and financiers who were not involved in the decisions to run the business. Those were therefore also not liable towards third parties - at least not beyond their investment. Their position was thus very similar to lenders.

The *société en commandite* was recognized in France's first commercial code, Colbert's Ordinance of 1673, and a more precise specification of the form was included in its 1807 commercial code, which received significant attention in other countries.⁵¹¹ This model with dual capacities among the members, would even be picked up by the common law world.⁵¹² Limited-partnership statutes represented an important legal innovation, since they grafted a civil-law institution into the common law. There, it became known as the limited partnership. The inclusion of "limited" in the structure's name pointed to the limited liability property instead of a limitation regarding potential activities.⁵¹³ An example of a country that picked it up, was Ireland in 1782.⁵¹⁴ In United

⁵⁰⁹ Francis Joseph Troubat, *The Law of Commandatary and Limited Partnership in the United States* (J Kay, jun & brother 1853); Max Weber, *The History of Commercial Partnerships in the Middle Ages* (Rowman & Littlefield 2003).

⁵¹⁰ For the history in France, see for instance: Freedeman (n 193).

⁵¹¹ See Charles M Cook, *The American Codification Movement: A Study of Antebellum Legal Reform* (Greenwood Press 1981). The first English translation of the 1807 commercial code appeared in 1814, in J Rodman, *The Commercial Code of France* (C Wiley 1814).

⁵¹² On the debates over the introduction of the *commandite* in England, see John Saville, 'Sleeping Partnership and Limited Liability, 1850-18561' (1956) 8 *The Economic History Review* 418.

⁵¹³ Sir Matthew Baillie Begbie, *Partnership 'En Commandite': Or Partnership with Limited Liabilities (according to the Commercial Practice of the Continent of Europe and the United States of America) for the Employment of Capital, the Circulation of Wages and the Revival of Our Home and Colonial Trade* (Wilson 1848); Troubat (n 509); Clement Bates, *The Law of Limited Partnership* (Boston, Little, Brown, and company 1886); Stanley E Howard, 'The Limited Partnership Association in New Jersey' (1936) 9 *The Journal of Business* 258; Robert A Kessler, 'With Limited Liability For All: Why Not a Partnership Corporation' (1967) 36 *Fordham Law Review* 235. In Louisiana, who was once a French colony and who thus adopted the organization type through that way, the form was later renamed as the partnership in *commendam*.

States, New York was the first of the common-law states to authorize the formation of such limited partnerships in 1822. By 1886, limited partnerships had been authorized in all but three of the then-existing states and territories.⁵¹⁵

Some limited-partnership statutes would expressly require that the financing partner (who was thus offered limited liability) could have no managing role. Partners with a management role then remained personally liable. Statutes also imposed registration requirements for such structures, together with the publication of the registration certificate in order to obtain that limited liability. However, when the existence of a financing partner is rather “silent”, and rather of an arm’s length nature (like a lender), then this also prevents liability.⁵¹⁶ In some countries, the registration was rather necessary to become a separate legal entity.

The institution of *commendite* or limited liability partnership appears to have facilitated investments that were unlikely to have occurred in its absence. Financers of limited partnerships were far less likely to be related to the managers, in contrast to partners in normal partnerships. The institution of the limited partnership may have facilitated efficient matches, but still not on a mass-scale as the inclusion of a partner normally relied on individualized negotiations and acceptances. Also, if a partner left or died, the partnership would dissolve; and the stake of the special partner was totally illiquid – it could not be sold or transferred without dissolving the firm. In 1838, Pennsylvania modified its limited-partnership statute to make the stakes of the special partners transferable, although the consent of the other partners was required. Other jurisdictions followed.⁵¹⁷ In France, a modified version of the limited partnership with fully transferable shares developed, known as the *société en commandite par action*, but this form was not explicitly authorized in the original 1807 code.⁵¹⁸

However, with parties of different productivity and capital levels, the asymmetry between parties then gives an incentive whereby those productive partners can engage in opportunistic behavior towards parties that are less involved in operations. Designing mechanisms to deal with it, are often costly and still incomplete. This will become clear hereafter. For those settings, the lawmaker would step in, especially to protect those that could not obtain individual protections. This would then also solve a coordination problem, and it could supercharge the onboarding of investors.

1.1.3. The history of the jointly owned stock corporations, with hired management

The inception of corporations was not necessarily to solve coordination problems when a large group of investors was needed. Rather, the “invention” of the concept of a corporate body, was the result of a need for institutions that outlived the lives or the

⁵¹⁴ EA French, ‘The Origin of General Limited Liability in the United Kingdom’ (1990) 21 Accounting and Business Research 15.

⁵¹⁵ Eric Hilt and Katharine O’Banion, ‘The Limited Partnership in New York, 1822–1858: Partnerships Without Kinship’ (2009) 69 The Journal of Economic History 615.

⁵¹⁶ Kessler (n 513).

⁵¹⁷ Troubat (n 509).

⁵¹⁸ Freedeman (n 193).

substitutions of the members. This initiated the need for a body with a legal existence independent of its members. Especially for an undertaking that could undertake multiple projects (instead of one single ship voyage, for instance), would this be a useful addition. As a result, the design would “lock in” the participants by giving them only a very limited right to dissociate. This should be understood in conjunction with the joint development of organized secondary markets, which offered a route for shareholders that wanted to get rid of their units. Those units were tradable. However, as the previous part has discussed, this system of secondary markets was particularly adequate in case all trades concentrated around a small number of generally known corporations, but it is less adequate in case of a large number of little known firms where transactions are then very slow and costly to find information about the state of such companies. Thus, effectively, for the bulk of the companies, there is no effective exit mechanism, compared to the early days of corporations – where all corporations were Big Corporations.

Here, I will discuss the emergence of this going concern property, as well as the move from a very selective use of this structure –subject to obtaining state licenses– to a widespread adoption where parties can just declare that they wish to adopt such structure.

Besides legal bodies that outlived their members, also other needs would spark the design of a corporate structure. Pooling money from a large group of people was one of them, especially in the era of ship voyages. The pooling of money that was undertaken by seamen initially happened on a project-per-project basis. Such project would dissolve after the completion of a voyage. As described above, the financing needs could be met through structures that combined financing partners with managing partners (merchants). The merchants did not have to negotiate individual investment arrangements. When they had enough bargaining power they could just present a standard set of investment terms – this exclusion of individual transaction costs solved a coordination problem when a large crowd was addressed. A standard share could then also easily be traded, as I described above that the tradability of investment units would grow. However, even when a standard share in such pooling would allow transferring it before the termination of the project, a valuation problem would arise whenever someone wanted to transfer such shares in the meantime. This valuation problem was luckily still relatively straightforward in such single project cases. The only major problem could come from the different timing of investments into the project. The lack of reinvestment and the lack of third party managers that would have discretionary power to decide on such reinvestment, would make this valuation problem much less complicated than the evolutions that would take place later, and that would also create substantial opportunities for opportunistic behavior by managers.

The shared ownership of ship journeys, on a project-per-project basis, was particularly popular in Holland, in the 15th and 16 century.⁵¹⁹ However, although such single projects would obtain monopolies for trade with certain cities and remote places, and although the expenses could be spread across a number of people, it was certainly not the case that such monopolies offered much advantages or that they would cancel out

⁵¹⁹ Riemersma (n 192).

external risks and uncertainties. A project was still an all or nothing undertaking (a ship could not come back) and the same type of spice could be imported by different ships, each having operated under its own and distinct monopoly. However, once they were put in the market in Holland, they all competed in the same market. Therefore, Johan van Oldenbarnevelt and prince Maurits forced to bundle all forces of the different Dutch cities, under the form of one going concern undertaking that would be granted a monopoly of 21 years on the trade with India, from 1602 onwards.⁵²⁰ That undertaking was the Dutch East Indian Company. Due to this ongoing of “multiproject” characteristic, a board system was established. Just like the investors, the board members would not be liable for obligations that the company had. Payoff would now be under the form of dividends, which would compete with reinvestment into new projects (ship voyages).

Similar developments would also simultaneously take place in other merchant nations, like England for instance which chartered of the Company of Merchant Adventurers.⁵²¹ Or also the example of Russia can be given, with the formation of the Muscovy Company to conduct ongoing trade between Moscow and London.⁵²² The concession of an adventurous monopoly was thus one of the early incentives to create the foundations of a legal innovation. Also the exploration and exploitation of new territories could be financed that way. The colonization would require the financing of activities, which required a pooling and a long blockage of funds. Those overseas or seagoing activities could also collide with war operations against competing initiatives of other nations (who were also offered a monopoly there). Thus, it was often a commercial and a military undertaking all-in-one. This phenomenon would continue to exist in the years that followed, and it was not unusual that money would be raised for war reasons: in 1789 for instance, bonds started to trade in New York to finance the war against England. However, this war financing often happened in a much more hidden way.

Overcoming a coordination problem to finance capital-intensive activities with investments from many members was thus a driver to come up with an innovative mechanism. But the mechanism would open Pandora’s box of potential managerial opportunism. A lack of control over the use of the funds (which took place many thousand kilometers away) allowed an easy opportunity for self-dealing for the managers, or for inducing investors to invest at overvaluations. The Mississippi Company with John Law in France was an example of a company that overvalued its assets to lure investors to invest.⁵²³ These are early examples of moral hazard, and they could lead to market breakdown if investors would realize that it is difficult to differentiate between honest and dishonest firms (regarding the use of the funds), and if no individual due diligence and protection mechanisms could be implemented.

When there would be a move towards more mundane uses of corporations, besides the privileged concessions of state monopolies initially, strict government regulation would start to include investor protections against this new phenomenon of managerial opportunism. Starting a corporation would for instance require government approval and it would be subject to a strict government regulation. Such regulations were often a

⁵²⁰ Gelderblom, de Jong and Jonker (n 194).; Dari-Mattiacci and others (n 194).

⁵²¹ Davis (n 197).

⁵²² Stimson (n 198).

⁵²³ Smith, *A History of the Global Stock Market* (n 201).

reaction against abuses of corporations in the past, like the Mississippi case that was described above, or the case of the South Sea Company in the United Kingdom and the Bubble Act that responded to that. Managers in corporations are not committed to the contractual obligations of the corporation, in contrast to managing partners in a partnership. Situations of self-dealing or fraud demanded a right to exercise a liability claim against them to prevent market breakdown if investors would not have the bargaining power to include this in an individually negotiated arrangement. Typically, legal tools to address agency problems tend to be introduced after experiencing serious corporate failures. The Bubble Act was an early example. Later examples were for instance the crash of the Ivar Kreuger empire in 1932 or the recent crash of Enron.⁵²⁴ Recent examples of regulatory responses are for instance the Sarbanes-Oxley Act of 2002 in the United States.

With the industrialization, the demand for such corporate entity substantially grew, as the need to pool and concentrate monetary resources also substantially grew. The specific need to obtain a governmental charter was therefore abandoned in France in 1867.⁵²⁵ Already from 1844 onwards, the creation of corporates happened through registration in the UK.⁵²⁶ The switch from privilege to simple registration spread throughout continental Europe and the United States. The increased availability of a liability limiting structure increased risk taking, which proved to offer welfare effects that emerged from experimenting with risky activities. This societal surplus came at an individual cost for counterparties when they traded with a limited liability entity that could file for bankruptcy due to its risk taking. A reaction to this was often a requirement for minimum capital, to have a buffer to service those counterparties. Even today –where incorporation has become a right instead of a privilege, some formalities are still present to receive that “limited liability” property in exchange.

1.1.4. The history of limited liability companies

Policymakers have thus realized the positive social welfare effects of having private agents that experiment and that take controlled risks, especially in terms of competitiveness of a region or country in an increasingly globalized setting. This led to the adoption of other limited liability structures, besides the corporations that assumed open calls towards large crowds without individual negotiation power. The limited liability companies are an example of that. In contrast to corporations, they offer more flexible internal governance rules instead of the state-imposed rules and they may potentially also not come with minority protection mechanisms like in corporate structures. But as they miss a number of protections, they cannot sell units to the public that would lack individual negotiation or due diligence power (public that would thus not be familiar with the company and its members), and units would not be traded. Or a transfer would at least be cumbersome in some ways: for instance requiring a formal notarial act, and an approval by the other members.

⁵²⁴ Jurg Gerber and Eric L Jensen, *Encyclopedia of White-Collar Crime* (Greenwood Publishing Group 2007); Gary Giroux, *Business Scandals, Corruption, and Reform: An Encyclopedia* (ABC-CLIO 2013).

⁵²⁵ Freedeman (n 193).

⁵²⁶ Maltby (n 207).

Those structures were first introduced in Germany, in 1892. Great Britain and France followed in 1907 and in 1925 respectively.⁵²⁷ In the United States, courts would initially hinder the creation of such companies.⁵²⁸ But then, since their introduction in 1988 in the United States, limited liability companies (LLCs) have gained much popularity.⁵²⁹ The popularity of the LLC has often to do with its tax treatment like a partnership.

Recently there has been an incentive to provide limited liability to sole entrepreneurs and managing partners of partnerships as well.⁵³⁰ A quarter of a century ago, professional partnerships became concerned with the individual liability of their partners. Jersey came with an innovation to offer those managing partners limited liability. When this created an exodus of partnerships from Britain to Jersey, Britain also passed the Limited Liability Partnership Act in April 2001.⁵³¹ Such forms have in other countries been largely forgotten, as many countries defaulted to corporate structures, but there inherently contractual nature makes them very flexible in settings where individual negotiation is possible. They are also easy to create, and require very few or no formalities. Flexibility may well become again a driver for the selection of the legal structure of an organization. Flexible (contractual) partnership-like structures with a bundle of default rights should offer the possibility to entrepreneurs and their stakeholders to create a structure that best matches their specific objectives.⁵³² Also for society may such freedom of contract offer the level of experimentation that may lead to wealth enhancing results.⁵³³

But despite this opportunity to offer limited liability company structures, and partnerships structures to those that want to use it in more flexible (individually negotiated) settings, many countries have pushed their limited liability company types

⁵²⁷ See for instance Phanor J Eder, 'Limited Liability Firms Abroad' (1951) 13 University of Pittsburgh Law Review 193; Henry P De Vries and Friedrich K Juenger, 'Limited Liability Contract: The GmbH' (1964) 64 Columbia Law Review 866; Steven C Bahls, 'Application of Corporate Common Law Doctrines to Limited Liability Companies' (1994) 55 Montana Law Review 43.

⁵²⁸ William J Carney, 'Limited Liability Companies: Origins and Antecedents' (1994) 66 University of Colorado Law Review 855; Timothy W Guinnane and others, 'Ownership and Control in the Entrepreneurial Firm: An International History of Private Limited Companies' (Economic Growth Center 2007) <<http://www.econstor.eu/handle/10419/26998>> accessed 21 February 2014.

⁵²⁹ William W Bratton and Joseph A McCahery, 'Inquiry into the Efficiency of the Limited Liability Company: Of Theory of the Firm and Regulatory Competition, An' (1997) 54 Washington and Lee Law Review 629.

⁵³⁰ McCahery (n 172); Joseph A McCahery and others, 'Traditional and Innovative Approaches to Legal Reform: The 'New Company Law'' (2007) 8 European Business Organization Law Review 7.

⁵³¹ Joseph A McCahery and Erik PM Vermeulen, 'Limited Partnership Reform in the United Kingdom: A Competitive, Venture Capital Oriented Business Form' (2004) 5 European Business Organization Law Review 61.

⁵³² Erik PM Vermeulen, *The Evolution of Legal Business Forms in Europe and the United States: Venture Capital, Joint Venture and Partnership Structures* (Kluwer Law International 2003).

⁵³³ Francisco Reyes and Erik PM Vermeulen, 'Company Law, Lawyers and "Legal" Innovation: Common Law versus Civil Law' (2011) Lex Research Topics in Corporate Law & Economics 2011-3 <<http://papers.ssrn.com/abstract=1907894>> accessed 8 July 2013.

towards the corporate gold standard⁵³⁴, or have not kept up with their partnership structures (or impose too many mandatory rules to those structures). Still, they may offer a suitable structure when a firm has rather an idea-driven nature, with an irreplaceable innovative entrepreneur that addresses investors on negotiated terms, compared to a capital-driven nature where investors select scientific managers. Today's technology-driven firms may have a different direction to initiate transactions, and this may need a move away from the strict and rigid corporate culture.

1.2. Emergence of a mastery and anticipation of agency and self-interest problems

Equity in corporate bodies is however the gold standard in technology-driven firms, as alternatives to the corporate gold standard are still often lacking. Standard debt with contractually fixed repayment modalities would be difficult to service for a firm that operates in an uncertain environment. Also lenders would have difficulties – as the premium to cover losses would be difficult to determine ex-ante. Also, if the loans that are extended would be refinanced on the debt market as well (by their lenders), regulations may impose duties and reserve requirements to cover losses.⁵³⁵ This increases the cost of capital substantially.

The lock up of funds from an equity investor does expose him to potential opportunistic hazards – more than in case of standard debt. This comes on top of the uncertain external operating environment and performance of such firm. Terminology may differ to differentiate the exposure to different sources of risks and uncertainties. Besides the differentiation between opportunistic risks and external risks that I just made, authors may for instance also differentiate between internal risks (related to limited abilities and capabilities in a firm), external risks (the external business environment) and execution risks that relate on the reliance on the founders (and their potential to behave opportunistically – to use hold up and moral hazard self-dealing tactics).⁵³⁶ Williamson proposed the “organizational failures framework” in which human factors (opportunism and bounded rationality) combine with environmental factors (uncertainty/complexity) to cause market and organizational failures.⁵³⁷ Others may call the external or environmental factors rather exogenous risks.⁵³⁸

A substantial body of knowledge emerged to master the risk of opportunistic behavior and other forms of misalignment. The managers are considered as the agent, which can potentially be disrespectful in case of entrepreneurial firms where the entrepreneur is

⁵³⁴ Marcus Lutter, Alfred Conard and René David, *Limited Liability Companies and Private Companies* (Mohr 1998).

⁵³⁵ Basel Committee on Banking Supervision, *International Convergence of Capital Measurement and Capital Standards: A Revised Framework* (Bank for International Settlements 2006).

⁵³⁶ Steven N Kaplan and Per Strömberg, ‘Characteristics, Contracts, and Actions: Evidence from Venture Capitalist Analyses’ (2004) 59 *The Journal of Finance* 2177.

⁵³⁷ Oliver E Williamson, ‘Markets and Hierarchies: Some Elementary Considerations’ [1973] *The American Economic Review* 316.

⁵³⁸ Ronald Gilson and others, ‘Building Foundations for a Durable Deal’ *Financial Times* (12 October 2006) <<http://www.ft.com/intl/cms/s/2/d4108446-5933-11db-9eb1-0000779e2340.html#axzz2txsh2Z7D>> accessed 21 February 2014.

the vector rather than the agent. Then, the task can thus be described as mastering agency problems and preventing other forms of harmful self-interest of these agents, especially when his reward creates an incentive for misalignment. Here, I will describe the different bodies where such mechanisms have been developed to protect against managerial and entrepreneurial opportunism.

Equity is widely associated with the corporate entity types. It is a highly standardized type of organizational structure, and this state-provided standard form solves a number of coordination failures for cases where the large number of investors would otherwise represent a too high transaction costs to come to a compromise with them all. For instance, the return decision under the form of dividends is often beyond the control of a single equity holder and takes place through voting (a state-provided coordination mechanism, that may today also need some modernization given the opportunities that internet and e-voting may offer⁵³⁹, and given today's cost that cross-border voting brings due to the intermediated shareholder systems that have been discussed in the previous part⁵⁴⁰). This standard form also includes a large number of protections against counterparty opportunism, to offer the ex-ante trust to potential investors that would otherwise not be able to negotiate them individually.

However, the use of such corporations in small circles of investors creates an accumulation of protections for the investors as the small setting (where transaction costs are manageable) is used to negotiate individual side letters as well. In partnership settings, these individually negotiated terms would virtually be the only terms. But in corporations, they supplement the state-designed mandatory rules. As a result, the balance of control has in many (negotiated) settings considerably shifted to the investor. This resulting "shareholder supremacy" will be discussed in a next title. Effectively, the otherwise discretionary choices of the managers/entrepreneurs are then heavily limited in favor of the investor (eventually with mechanisms that shift control depending on the performance).

1.2.1. Social and market mechanism: trust, reputation, a lack of lock-in

A first mechanism to align interests is via social sanctions that can be without explicit norms⁵⁴¹: social actions following reputational breaches can influence the continuation of a manager's position.⁵⁴² Reputation concerns in general induce parties to adhere to

⁵³⁹ Dirk A Zetzsche, 'Corporate Governance in Cyberspace - A Blueprint for Virtual Shareholder Meetings' (Center for Business & Corporate Law 2005) 11 <<http://papers.ssrn.com/abstract=747347>> accessed 3 March 2013.

⁵⁴⁰ Hölz (n 482).

⁵⁴¹ John C Coffee Jr, 'Do Norms Matter—A Cross-Country Evaluation' (2000) 149 *University of Pennsylvania Law Review* 2151; Marcel Kahan, 'The Limited Significance of Norms for Corporate Governance' (2001) 149 *University of Pennsylvania Law Review* 1869.

⁵⁴² Andrei Shleifer and Robert W Vishny, 'Management Entrenchment: The Case of Manager-Specific Investments' (1989) 25 *Journal of financial economics* 123; David Hirshleifer, 'Managerial Reputation and Corporate Investment Decisions' (1993) 22 *Financial Management* 145.

implicit contracts and norms⁵⁴³, and for a manager or entrepreneur this is expressed through the risk of being voted away. The transparent flow of information can destroy a reputation with other potential (but not previously harmed) investors as well. The investment to build up reputation, and thus to signal trustworthy behavior is long, and therefore so costly that managers or entrepreneurs will not necessarily easily jeopardize it.

For publicly traded companies, this potential to replace a manager also resulted in a market for control.⁵⁴⁴ If management is inefficient, the share price will likely be less than what it would be under efficient management. This will make a takeover of the company cheaper and more likely. Because takeovers usually result in a change in management, a manager who wants to keep his or her job will work to maintain a high share price. However, such public scrutiny may make it also very uninteresting to become a public company as the consequences of a governance error, misjudgment or miscommunication may be exaggerated and may even create systemic consequences for events that are linked to the share price.

1.2.2. Contractual mechanisms or company charter provisions

Contractual covenants or compensation schemes are also often designed to increase the alignment – together with monitoring or informational mechanisms to check the continuous alignment. In partnership structures, and other flexible structures, these are generally the main source of protections, besides the reputational mechanisms above.

But also in corporate structures with state-provided equity-linked rights, the corporate charter or a side letter may have been negotiated to decrease the discretionary power of the manager/entrepreneur/investee, and to consult the shareholder for more situations or even to offer him full control over some situations (potentially the appointment of a board member or a director) through mandatory approvals and authorizations. For example, investment contracts often contain covenants or terms according to which large and fundamental corporate decisions (such as mergers and charter amendments) require the prior written consent of the investors.⁵⁴⁵ This may also be indirectly, through disproportionately high voting power after creating a share class that offers such disproportionate voting power, a practice that is allowed in many jurisdictions.⁵⁴⁶

⁵⁴³ Robert D Cooter and Melvin A Eisenberg, 'Fairness, Character, and Efficiency in Firms' <http://works.bepress.com/cgi/viewcontent.cgi?article=1082&context=robert_cooter> accessed 21 February 2014.

⁵⁴⁴ See for instance: Alvaro Cuervo, 'Corporate Governance Mechanisms: A Plea for Less Code of Good Governance and More Market Control' (2002) 10 *Corporate Governance: An International Review* 84.

⁵⁴⁵ Reinier Kraakman and others, *The Anatomy of Corporate Law: A Comparative and Functional Approach* (Oxford University Press 2009).

⁵⁴⁶ For seminal papers on this matter: see Steven N Kaplan and Per Strömberg, 'Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts' (2003) 70 *The Review of Economic Studies* 281; Kaplan and Strömberg, 'Characteristics, Contracts, and Actions' (n 536).

The use of stocks with preferred dividend and liquidation rights is possible as an example of more contractual terms that are added to standard equity. This preferential claim can relate to fixed rate dividend payouts (or accumulations) or adjustable rate dividends.

Covenants may also be of the anti-dilution form, namely to increase voting and payoff rights (often through increasing share percentages) in case of adverse progression and consequent fundraises that would overly dilute the initial investors during equity sales at lower prices per share.

Besides increased voting and payoff rights and board rights, the contract can also contain redemption provisions to have an exit to step out of potentially opportunistic situations. It is actually a principle of the traditional equity instrument design that seeking a return results in a lot of complications – which often boils down to having to find a buyer for a secondary transaction. Therefore, exit design is an important element to mitigate dependencies. This may also be through the allocation of IPO registration right to the investor. After all, an IPO will also require the collaboration of the company itself (i.e. filings of disclosure documents, applications at stock exchanges, etc.), and an investor can contractually obtain such compulsory collaboration under his instructions.

Staged financing and rights to convert between investment instruments (and their payoff structures and associated rights) can also be given as examples of contractual mechanisms. Staged financing is a mechanism to reverse the dependency and the holdup power that an entrepreneur or investee can exercise and to put it back in the hands of the financier. Staged capital infusion gives investors the option to cut off badly performing ventures from new rounds of financing.⁵⁴⁷ It creates an option-like structure.⁵⁴⁸ However, staging also creates potential opportunism and conflicts between the entrepreneur, the initial investors (the ‘insiders’), and potential new investors (the ‘outsiders’). This will be discussed further.

It is also very common to agree for convertible securities. This can for instance be equity that can be converted to debt (to increase the payoff certainty as it then becomes a contractual obligation instead of a mere hypothetical but permanently deferrable claim), but it can also go in the other direction – debt to equity. The equity can also be preferred equity to still have some certainty regarding the return instead of merely having a hypothetical claim. Potentially, the conversion right can even be from preferred stock to common stock. Such conversion right offers the option to choose whether they will get money through the obligation-type payoff (but relatively fixed, irrespective the performance) or through the equity payoff when a substantial upside or secondary trading value would make this more interesting. Convertible securities are widely used in venture capital finance to minimize the expected agency problems.⁵⁴⁹ It offers more freedom of choice in different states of the world.⁵⁵⁰

⁵⁴⁷ Paul Gompers, ‘Optimal Investment, Monitoring, and the Staging of Venture Capital’ (1995)

⁵⁰ The journal of finance 1461; Gompers and Lerner (n 55).

⁵⁴⁸ William A Sahlman, ‘The Structure and Governance of Venture-Capital Organizations’ (1990) 27 Journal of financial economics 473.

⁵⁴⁹ For instance: Steven N Kaplan and Per Strömberg, ‘Venture Capitalists as Principals: Contracting, Screening, and Monitoring’ (National Bureau of Economic Research 2001) <<http://www.nber.org/papers/w8202>> accessed 21 February 2014; Kaplan and Strömberg,

1.2.3. *Publication of privately designed mechanisms and standards*

Designing contractual mechanisms is costly. Standards can offer a template or blueprint, but are also costly to design. That is why such public goods are often provided by the state. Still, a number of such standards exist like corporate governance codes from private bodies. Other examples are standard business angel and venture capital term sheets. Seedsummit published for instance such standard term sheets for business angel investments.⁵⁵¹ Some venture capital associations did the same.

Sometimes, especially in case of corporate governance codes, industry associations have a collective interest to prevent the government from stepping in in producing these standards. Therefore, they may produce them themselves. The use can then be effectively imposed through “comply or explain” reputational and signaling mechanisms in a business community. They may even be imposed by the stock exchange in case of a listed company.

Only in a minority of the cases such corporate governance rules then directly created and imposed by the government (the German Corporate Governance Code is one of those exceptional examples: it was adopted by a government commission on 26 February 2002, and is reviewed yearly by the government commission).

Such corporate governance standards may contain alignment and monitoring mechanisms such as management remuneration rules and board of director functioning. The purpose of such reward strategy is to alter the incentives of managers and entrepreneurs rather than expanding the powers of investors. One corporate governance mechanism, is limiting the remuneration, or at least the incentives that it is coupled to in order to lower the incentives for self-dealing. This is done in two ways:⁵⁵²

- ⇒ Tying managers’ or entrepreneurs’ remuneration to the performance of the firms, especially if information can accurately credit managerial effort for the performance. But managers and entrepreneurs may be less sensitive to performance-based remuneration at riskier firms, like technology driven firms.⁵⁵³
- ⇒ In settings where the managers are replaceable and where they are appointed by the investors, is it a common belief that executive compensation should be based not only on the returns to the firm's shareholders but also on signals and information about the actions taken by the manager. A prominent example of such a variable is the returns of other firms in the same industry. Compensation

‘Characteristics, Contracts, and Actions’ (n 536); Paul Gompers, ‘Ownership and Control in Entrepreneurial Firms: An Examination of Convertible Securities in Venture Capital Investment’ <<http://www.hbs.edu/faculty/Pages/item.aspx?num=11203>> accessed 21 February 2014; Thomas Hellmann, ‘IPOs, Acquisitions, and the Use of Convertible Securities in Venture Capital’ (2006) 81 *Journal of Financial Economics* 649.

⁵⁵⁰ Francesca Cornelli and Oved Yosha, ‘Stage Financing and the Role of Convertible Securities’ (2003) 70 *The Review of Economic Studies* 1; Leslie M Marx, ‘Efficient Venture Capital Financing Combining Debt and Equity’ (1998) 3 *Review of Economic Design* 371.

⁵⁵¹ <http://www.seedsummit.org>

⁵⁵² Rajesh K Aggarwal and Andrew A Samwick, ‘Executive Compensation, Strategic Competition, and Relative Performance Evaluation: Theory and Evidence’ (1999) 54 *The Journal of Finance*.

⁵⁵³ *Ibid.*

contracts should be based on the relative performance of the manager compared to that of his industry rivals.

However, this does not take into account that performance-based compensation should be calculated on the basis of how well they reach the firm's long-term goals, rather than short term objectives that may be harmful in the long run. Also, it can give an incentive to grow the firm beyond its efficient scale. Short-term financial investors may after all prefer a high return on their investment in the short term and are not affected by what will happen to the firm after they have sold their shares. Most shareholders –and managers that are appointed by them– in listed companies belong to this category. One of the ways to make share option programs behave less badly from the perspective of the firm is to use long-term lock-ins to reduce the temptation to do reckless deals that can harm the firm in the long run.

Besides remuneration mechanisms, a major element to prevent misalignment is often the composition and the structure of the management of the firm. This is also often included in state provided corporate laws (very often in a mandatory way, instead of a matter of choice or a matter of suggestion through default rules).

1.2.4. State provided mechanisms

The production of government-issued alignments and monitoring systems is induced by the role firms have in increasing social welfare. However, this is balanced by social welfare considerations and states to an active role in protecting investors through company law. Still, social welfare states do not necessarily offer the highest level of investor protection: common law countries do still have a higher level of investor protection than civil law countries.⁵⁵⁴

Because individual shareholders may otherwise lack the bargaining power to obtain contractual protections, a market breakdown could result or the lack of trust could at least prevent coordination surpluses from arising. Standard equity and the corporate structure thus also largely help to solve a coordination failure. Shareholders may potentially be too dispersed otherwise.⁵⁵⁵ As a result, the shareholders do not have the incentive to control corporate management effectively, or they may lack the bargaining power to obtain protections. If such protections would be lacking, then investors would invest in other assets than companies (which would thus potentially not create societal surpluses). Shareholder protections in company laws may be possibilities to pierce the corporate veil, or to make managers liable.⁵⁵⁶

There are several other reasons for letting governments produce such rules: it offers economies of scale for the production of norms, and rules are effectively public good

⁵⁵⁴ Joseph A McCahery, Zacharias Sautner and Laura T Starks, 'Behind the Scenes: The Corporate Governance Preferences of Institutional Investors'

<http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1571046> accessed 8 May 2014.

⁵⁵⁵ *Berle and Means (n 499)*.

⁵⁵⁶ Bratton and McCahery, 'The Equilibrium Content of Corporate Federalism' (n 97).

goods. Also, in their capacity of published standards, network effects can arise around legislative products.⁵⁵⁷

The government provides two types of rules: customizable default rules, and mandatory rules. These mandatory elements come at a cost of reduced flexibility to tailor the entity to a particular situation that would set it apart from the situation that the lawmaker had in mind. Mandatory rules can for instance be the separation of management and boards (who do the oversight) in European corporate laws. But mandatory rules are not necessarily to be found in company laws. Also external regulations may have such rules. For instance, the Sarbanes-Oxley Act introduced collective responsibility for management – which creates a form of checks and monitoring by peers.

Also reporting and information rights are often found outside corporate laws, in accounting rules. Listed companies in Europe need to report through IFRS rules for instance⁵⁵⁸, and they are subject to transparency rules from the Transparency Directive. Some firms are also subject to auditing.⁵⁵⁹

One inherent property of accounting and reporting regimes, is the fact that they can be an object of gaming, and that everything relies on valuation. One type of valuation manipulation may be accrual manipulation as valuations are based on accruals in accounting, instead of cash flows (except for the specific cash flow reporting, which can actually serve as an instrument to have better insight in the disparities between cashflows and accruals – which can potentially be an indication for earnings management⁵⁶⁰). As not cash flows are used, but recognition of accrued earnings and costs, which anticipates cashflows, it means that this timing of recognition can be used to misreport. It are however specifically the discretionary accruals that are subject to such manipulation, as also a number of accruals are prescribed by accounting standards (together with a prescribed calculation method) and these may therefore be non-discretionary.

For high tech companies, it will especially be the research and development expenditures, and related income from know-how, patents, licenses, and other intangible sources that will create opportunities for discretionary accruals manipulations. On the balance sheet, these are represented by intangible assets, and under IFRS, they are covered by International Accounting Standard (IAS) 38 – the type of standards that are issued by the standard setting body of the IFRS system. IAS considers an intangible asset as "an identifiable non-monetary asset without physical substance". As it is already classified as an asset anyway, it also implies that there is a

⁵⁵⁷ Erik PM Vermeulen, 'The Role of the Law in Developing Efficient Corporate Governance Frameworks', *Corporate governance of non-listed companies in emerging markets* (OECD 2006).

⁵⁵⁸ Directive 78/660/EEC (Fourth Company Law Directive), Directive 83/349/EEC (Seventh Company Law Directive) and Directive 2003/51/EC. Regulation 1606/2002 (IAS Regulation), Regulation 1725/2003 and Regulation 707/2004 amending Regulation 1725/2003.

⁵⁵⁹ Article 51 of Directive 78/660/EEC (Fourth Company Law Directive), Article 37 of Directive 83/349/EEC (Seventh Company Law Directive), and Directive 2006/43/EC (Eighth Company Law Directive)

⁵⁶⁰ Paul M Healy, 'The Effect of Bonus Schemes on Accounting Decisions' (1985) 7 *Journal of accounting and economics* 85.

resource that emerged from a past event, and that is controlled by the firm and which also creates the expectance for future economic benefits. The identifiability is thus the main element that IAS 38 adds, and it comes down to the potential to be separable or that it arose from a contractual or legal right. For the generation of such resource, and thus the recognition as an intangible asset or not, IAS 38 requires a split up between the research and the development phase. Research is "the original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding" and development is "the application of research findings to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems, or services, before the start of commercial production or use". Thus, for the distinction between either the treatment of expenses, or the accumulation as an asset, this split up is important. And if no distinction can be made, then it needs to be treated as research entirely, which then implies that all expenses need to be expensed. This is a form of prudence, as the discretionary element can be found in the uncertainty that future economic benefits will emerge. Once expenses classify as development, and thus once it becomes possible to recognize future economic benefits that will flow, those expenses are capitalized.

1.2.5. Role of state provided judicial enforcement

Governments also provide third party enforcement, besides the provision of mandatory and default rules. For instance, norms regarding management behavior are sanctioned through liability mechanisms. These may be generic or specific. For instance, there is a trend towards an increasing number of specifying economic offences that are committed by white-collar offenders (sanctioned through criminal liability).⁵⁶¹

But besides the generic or specific liability situations that have been foreseen upfront, either through government provided rules, or through contracts that have been designed by the parties, misbehavior is also sanctioned through fiduciary duties and good faith notions. The theories around fiduciary duties, duties of care, duties of loyalty and good faith are generic theories. They are not specific to company settings. In Anglo-American law, such fiduciary duties are present when an agent is acting for a principal, and when there is an informational imbalance and a power dependency.

However, a nexus-of-contracts school uses the view that firms should be seen as nothing more than a set of relational contracts among its participants⁵⁶², where no fiduciary duty may be assumed as this would otherwise be an unwanted addition to the terms that the parties actually provided themselves. Some of the theory's assumptions are the rationality of the participants (they will enter into efficient governance

⁵⁶¹ James Q Whitman, *Harsh Justice: Criminal Punishment and the Widening Divide Between America and Europe* (Oxford University Press 2003).

⁵⁶² Michael C Jensen and William H Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure' (1976) 3 *Journal of financial economics* 305.

structures, and the fact that judicial enforcement is not necessary as the contracts are self-enforcing.⁵⁶³

And irrespective if rules are foreseen or not, or if one needs to rely on notions like good faith or duties of loyalty, the fact is that a bad outcome can be attributable to adverse external circumstances as well (besides managers' faults of opportunism). Managers can therefore benefit from the business judgment rule, or equivalents (for instance in §93(1) AktG in Germany). In the US for instance, one will have to prove that managers acted out of willful misconduct, acted in bad faith, or were grossly negligent to win a case.⁵⁶⁴

Company laws often make it very difficult or impossible for shareholders to bring proceedings against negligent board members. Obviously, civil liability does not work as a deterrent unless it can be enforced. For small shareholders, this burden can even be higher and also be of the form of a coordination failure – this can then be solved through allowing class action lawsuits.

1.2.6. Listing rules and stock exchanges requirements on one-sided adoption of mechanisms

Other sources of alignment rules may be listing rules, that foresee monitoring rights and the availability of some alignment mechanisms. This may also be for the relationship between shareholders itself, instead of the investor-investee relationship: for instance by imposing one-share-one-vote rules (like the New York Stock Exchange for instance).⁵⁶⁵ However, NASDAQ and AMEX chose not to follow a similar policy and in consequence effectively competed with NYSE by attracting companies with dual class shares.

1.2.7. Conclusion: shareholder supremacy

The mechanisms that have been created heavily increased the power and control of shareholders, especially when contractual mechanisms were combined with already state-provided corporate equity mechanism. This increased the control to a level what can be called the shareholder supremacy.

⁵⁶³ Joseph A McCahery and others, 'The New Company Law: What Matters in an Innovative Economy' [2006] ECGI-Law Working Paper <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=942993> accessed 5 March 2014.

⁵⁶⁴ Constance E Bagley, 'Winning Legally: The Value of Legal Astuteness' (2008) 33 *Academy of Management Review* 378.

⁵⁶⁵ Marcel Kahan, 'Some Problems with Stock Exchange-Based Securities Regulation' (1997) 83 *Virginia Law Review* 1509; Robert B Thompson, 'Collaborative Corporate Governance: Listing Standards, State Law, and Federal Regulation' (2003) 38 *Wake Forest Law Review* 961; Guido Ferrarini, 'One Share – One Vote: A European Rule?' (2006) 3 *European Company and Financial Law Review* 147.

One might argue that shareholders deserve to be dominant within the corporate structure because that is what having a residual interest means. Ownership is defined as the residual claim. But the shift in control is perhaps excessive. Also, shareholders are too often considered as the sole residual claimholders – but it is not generally accepted anymore to have managers’ and directors’ fiduciary duties flow exclusively to them.⁵⁶⁶ Also other stakeholders are now considered (employees, etc.).

However, in innovative firms, where the entrepreneur is the main engine of the firm and of the societal wealth that can be created, such investor dominance can be questioned. Also, that supremacy – and the mechanisms that have been described above – even created some problems in their own right: namely where the shareholder actually can behave opportunistically. The mechanism of staging for instance, allows putting hold-up power in the hands of a financier.⁵⁶⁷ Investors can even use that right with self-interest objectives.⁵⁶⁸ Such events can be used to shift control toward venture capitalists with certain clauses like anti dilution clauses. However, the practice of staged financing should not necessarily be bad for entrepreneurs as it enables them to retain a higher ownership stake if things work out well.

Convertible instruments can mitigate this venture capitalist opportunism, especially convertible preferred equity where the conversion only takes place when it is profitable for both parties.⁵⁶⁹ Also more availability of specialized debt in the venture capital market would certainly reduce some of the stress that dilution otherwise brings with equity investments (in contrast to debt investments).

The above described body of knowledge around the standard of corporations and equity, have mainly assumed the usage of scientific management – or hired management who worked for a principal, namely the shareholder. In such cases it can actually be useful to increase the control power of the investors, as the managers can then be rather instructional but they do not necessarily have extremely unique qualities that would prevent a control takeover. However, such an instructive or overly controlling nature of managing a company works well in industries with little specific knowledge. But in industries where creativity is required to gain market share, a tolerance to accommodate the idea-driven nature of the entrepreneur may be necessary, instead of the focusing on the potential “misalignment” and the shift in control it may require. Entrepreneurs need freedom. Entrepreneurs should not always be considered as just agents for principals (investors). Some researchers have suggested that the literature on venture capital monitoring and its assumptions regarding information asymmetry and opportunism, should be more positive.⁵⁷⁰ On

⁵⁶⁶ Jonathan R Macey, ‘Economic Analysis of the Various Rationales for Making Shareholders the Exclusive Beneficiaries of Corporate Fiduciary Duties, An’ (1991) 21 *Stetson Law Review* 23; Jonathan R Macey, ‘Fiduciary Duties as Residual Claims: Obligations to Nonshareholder Constituencies from a Theory of the Firm Perspective’ (1998) 84 *Cornell Law Review* 1266.

⁵⁶⁷ Daniel M Cable and Scott Shane, ‘A Prisoner’s Dilemma Approach to Entrepreneur-Venture Capitalist Relationships’ (1997) 22 *Academy of Management Review* 142.

⁵⁶⁸ Rafael Repullo and Javier Suarez, ‘Venture Capital Finance: A Security Design Approach’ (2004) 8 *Review of finance* 75.

⁵⁶⁹ *Ibid.*

⁵⁷⁰ Dirk De Clercq and Harry J Sapienza, ‘The Venture Capitalist-Entrepreneur Relationship: The Creation of Relation Rents’ (2001) 3 *Venture Capital* 107; Jonathan D Arthurs and Lowell W

many aspects, investors and entrepreneurs have aligned goals and it may be better to focus most of the energy on that. The greatest commodity of entrepreneurship is the economic freedom of self-determination. The difference between an agent and a vector can be drawn between only representing interests of a principal, or a principal that rides on realization of a visionary intentions of the frontman.

1.3. Mastering misalignments between investors / shareholders

There may thus be a presence of different very controlling investors that obtained their position through customized contractual mechanisms, and it may co-exist with investors that did not obtain negotiated terms. Those should potentially be protected against opportunism and self-dealing of those other or more controlling investors. Between investors with negotiation power themselves, the protections between each other's power (and risk for opportunism) may be via contractual way.

A similar situation already existed in the debt and loan industry, as they for instance developed a number of protections and customizations to limit the risk of expropriation of wealth or a repayment base by equity holders. Shareholders and debtholders may be in a conflicting situation, as both want a part of the same revenue stream – but debtholders have no voting power to appoint willing managers. This knowledge can also be applied to hybrid instruments that will be discussed next, as they will be as vulnerable for the harmful self-interest of other investors like equity holders (and potentially even the managers that are appointed by equity owners). Shareholders may have an incentive to let the venture also issue contractual financing instruments as they can then shift part of the bankruptcy cost to those contract holders (i.e. debtholders). In good times, shareholders incur the profit; in bad times they are only liable for the invested sum and contractual investment holders share in the risk of default. Covenants can protect against this.⁵⁷¹ For instance:

- Protections to maintain minimum net worth or net working capital (current assets, less current liabilities) or return coverage ratios (ratio of earnings to return obligation), or obligations to hold a specific ratio of tangible assets;
- Restrictions on dividend payouts. Dividend payments, always reduce a portion of the firm's assets and do thus always impact contractual investors;
- Covenants restricting the number of contractual financings as they increase the total number of claims on the firm's assets;
- Collateral requirements, like a secured contract, to have rights to the firm's assets in case of default.

Investors that don't have negotiation power to obtain contractual protections will need state-provided help when they co-exist with investors that had full negotiation power. This will also be discussed next.

Busenitz, 'The Boundaries and Limitations of Agency Theory and Stewardship Theory in the Venture Capitalist/entrepreneur Relationship' (2003) 28 *Entrepreneurship Theory and Practice* 145.

⁵⁷¹ Mark Grinblatt and Sheridan Titman, *Financial Markets and Corporate Strategy* (McGraw-Hill 2011).

1.3.1. *Controlling mechanisms through government-provided rules*

State-provided rules may contain protections for non-negotiated equity investors vis-à-vis negotiated shareholder. For instance, to prevent the public scrutiny, the cost to prepare a prospectus and the cost of using an underwriter, firms may choose to raise capital with a small number of wealthy investors in a negotiated way, instead of addressing the anonymous crowd of existing investors in standard and non-negotiated equity. In case of a publicly traded company, this is called Private Investments in Public Equity (PIPEs). However, company laws and listing rules in many European jurisdictions hinder the usage of PIPEs, to protect the anonymous and non-negotiated shareholders. Not only will the national company law need to allow a sufficient amount of authorized capital that the board of directors can raise without invoking a shareholder's meeting to obtain shareholder approval, the national company law also need to allow that such shares to the select group of wealthy investors can be issued without applying preferential or preemptive rights that all shareholders normally have in Europe over newly issued shares.⁵⁷² For instance, in Germany, the management board can be authorized to issue shares to unspecified investor without further shareholder action, up to 50% of the value of the outstanding shares when the shareholders authorize this but not more than 10% at the time of an actual increase (German Stock Corporation Act §182 and §202). The issue price for the new securities may also not be substantially lower than the current stock price (shares that are offered in a PIPE transaction, are typically offered at a discount like 5% but they also often have a lock-up arrangement attached to them). Also, such delegations to increase the capital are generally limited in time, and this timeframe must sometimes be very short: for instance maximum 2 years for France (Code de Commerce art. L225). Regarding the disapplication of preferential rights for instance, in the UK, listed companies can disapply the pre-emptive rights (section 89 of the Companies Act 1985, amended by the Companies Act 1989). In Germany, shareholders approval for an exclusion of the pre-emptive rights is also possible according to the German Stock Corporation Act (§186), just like shareholders in French companies have to possibility to waive their preferential rights in favor of the public at large (Code de Commerce art. L225). In such cases, such countries apply strict formal procedures and limits.

State-provided rules do also contain protections for minority shareholders. They also need a level of protection to create a suitable level of trust to prevent a breakdown or adverse selection in this market (which would be a social welfare cost). Therefore, government regulations have stepped in and many company laws contain mandatory rules to prevent adverse situation for minority shareholders.

Mandatory pro rata distribution rights and mandatory pre-emptive rights are mechanisms the can indeed protect minority shareholders, and non-negotiated shareholders. Basically, they exclude the level of customization for those shareholders that do have negotiation power.

Corporations typically have protections for minority shareholders. But closely held company types may lack them. Together with the lack of fully developed state-provided

⁵⁷² Barbara A Jones, Matthew H Hurlock and Pamela R Henry, 'Structuring PIPE Transactions in Key European Jurisdictions' (2003) 37 International Lawyer (ABA) 23.

protection mechanisms for investors vis-à-vis managers, this justifies the fact that such company types may not be marketed beyond a kin network or social network of people that would basically have the negotiation power to obtain customized protections or that could fall back to social sanctions in their network to the manager and other shareholders.

Also in cooperatives may there be a problem between outside investors and members, which is a reason why some countries do not allow outside investors in cooperatives.⁵⁷³ Cooperatives in other countries, like Finland, Hungary and Slovenia cooperatives and even the European Cooperative can accept financial investors.⁵⁷⁴ The issue relates to the allocation of the net proceeds of the company between members or shareholders, if such external shareholders are present. Shareholders and member-suppliers have intrinsically conflicting interests. Members that supply to the cooperative want a high price for their products, whereas shareholders want to minimize costs and maximize profits (they thus prefer that the cooperative buys at low prices). One way of solving part of this problem is excluding outside investors from voting rights. However, if investors do not have control rights, they usually demand more return (and more secure ones – i.e. under the form of preferred stock).⁵⁷⁵ Another way of solving a part of the problem is by limiting the distribution, to one that is proportional to the distribution to members.

1.3.2. Controlling mechanisms through judicial enforcement

Finally, government also steps in through mechanisms of fiduciary duties and good faith to protect in cases where the rules still leave gaps. Those have been discussed above. However, the theory of fiduciary duties will not always apply here. Some US states recognize a fiduciary duty on the level of majority shareholder toward minority shareholders. In Massachusetts, this is the case. But it is not the case in Delaware, where they consider that all shareholder protections should be obtained contractually.⁵⁷⁶

⁵⁷³ Sangen, G.J.H. van der, 'Financiering van de coöperatie met beleggingskapitaal : onbekend maakt onbemind', *De coöperatieve onderneming : vijf thema's over de veranderende rol van de coöperatie* (WEJ Tjeenk Willink 1999); Jos Bijman and others, 'Support for Farmers' Cooperatives' [2012] EU synthesis and comparative analysis report Transnational Cooperatives <http://www.juricoop.coop/juricoop/iso_album/etude_sur_les_cooperatives_agricoles_europeennes.pdf> accessed 8 May 2014.

⁵⁷⁴ European Commission, 'Study on the Implementation of the Regulation 1435/2003 on the Statute for European Cooperative Society:' (2010) <http://ec.europa.eu/enterprise/policies/sme/files/sce_final_study_part_i.pdf> accessed 20 November 2012.

⁵⁷⁵ Jos Bijman and Onno van Bekkum, 'Cooperatives Going Public, Motives, Ownership and Performance', *International Conference on Economics and Management of Networks (EMNet), Budapest, Hungary* (2005) <http://emnet.univie.ac.at/fileadmin/user_upload/conf_EMNet/2005/papers/Bijman.pdf> accessed 18 April 2014.

⁵⁷⁶ Jose M Padilla, 'What's Wrong with a Washout: Fiduciary Duties of the Venture Capitalist Investor in a Washout Financing' (2001) 1 *Houston Business & Tax Journal* 269.

Also in situations with closely held companies instead of corporations, the partnership-like elements may prescribe that duties of good faith and loyalty apply.⁵⁷⁷ The Delaware courts have still been reluctant to recognize this and have also here relied on contractarian standpoints.⁵⁷⁸

In Europe, the notion of good faith usually does not make a distinction between the types of an entity and applies universally to the exercise of all rights.

1.4. Beyond debt and equity: revenue sharing, and a suitable role for unincorporations

Negotiated equity investments have thus resulted in situations where the investor has substantially higher levels of control compared to the standard arm's length terms that were drafted by the lawmaker. This practice is especially true in case of technology-driven firms where the importance or presence of dividend distributions is virtually non-existent in case of common equity. The result often approaches standard debt with a fixed payoff that is less exposed to opportunistic risks and external risks by default – the need to repay interest creates a form of discipline and the reduction in free cash that it brings will also lower the opportunity to use such free cash for managerial self-interest.

At the same time, partnership structures where one actually has full freedom to negotiate individual and contractual terms to invest have been left underused in many jurisdictions. For instance, for investors that rather want a customized return scheme for their investment –to make it less dependable on a secondary market than equity in a corporation– have such partnership structures advantages due to their inherent contractual freedom. Proponents of private ordering within firms prefer the freedoms of partnership law to the mandates of corporate law.⁵⁷⁹ Customized investments can offer a better fit for entrepreneur-driven transactions to access resources, in contrast to investor-driven transactions to access managerial capacity.

Entrepreneurs in technology-driven firms do also not require the capital pooling like in large industrial firms. Especially in settings where there is a low number of (potential) investors, and where there are thus no high coordination costs during the contracting phase, there is less need for a source –for example a state-provided source– of standardized terms. But also in cases where investors will lack the power to solicit information (due diligence) and negotiate individual terms, a company may well be able to unilaterally present an investment format that is fair and that provides protections

⁵⁷⁷ John AC Hetherington and Michael P Dooley, 'Illiquidity and Exploitation: A Proposed Statutory Solution to the Remaining Close Corporation Problem' (1977) 63 Virginia Law Review 1.

⁵⁷⁸ Tamar Frankel, 'The Legal Infrastructure of Markets: The Role of Contract and Property Law' (1993) 73 Boston University Law Review 389; Rachel Weber, 'Why Local Economic Development Incentives Don't Create Jobs: The Role of Corporate Governance' (2000) 32 The Urban Lawyer 97.

⁵⁷⁹ Robert W Hillman, 'The Bargain in the Firm: Partnership Law, Corporate Law, and Private Ordering within Closely-Held Business Associations' (2005) 2005 University of Illinois Law Review 171.

against opportunism and misalignment just like standard state-designed equity would do. However, partnership laws still require the agreement of partners to accept new partners, and this can certainly be made more “open” to be able to accept new but yet unidentified partners through open outcalls – as long as a reasonable level of protection against opportunism is offered when they cannot negotiate it.⁵⁸⁰ Also, partnerships can be difficult to use on a cross border basis due to the existence of foreign default and mandatory rules that may step in. In the United States there is a form of creditor protection when many creditors reside in a state. In Europe, local policy for foreign structures is often based on mandatory rule exceptions and are justified under EU law by mandatory reasons of public good (as long as they are proportional and non-discriminatory).

An example of an investment structure that can offer reasonable protections against opportunism may be a self-cancelling revenue sharing investment format. This may still offer some repayment obligations like debt does, and may therefore reduce the potential of opportunism and misaligned behavior to make it still suitable to offer this on an arm’s length and non-negotiated basis to investors in the crowd. This does however not mean that investors are isolated from all counterparty risks as investors in debt or hybrid instruments may for instance still have a risk that equity holders and managers can expropriate wealth in the sense that their repayment base or security base can be affected.

Such revenue sharing arrangements do not have an ownership component, in contrast to equity. The ownership and consequent voting component of equity actually served to make it permissible to fail to generate an income for the investor (dividend).⁵⁸¹ Then, future accumulation of wealth (even if it is not distributed) could still be distributed at termination – for which the ownership component then still guaranteed the participation in those proceeds. Or the instrument could be passed on to another investor against an instant price, irrespective of the motivations of that other investor: whether for obtaining access to the complementary resources of the company, or to attend the distribution of equity or liquidation distributions, or to speculate in a confidence game that another investor would later offer a higher price for the instrument. If such ownership and voting component had been there, then failure to generate a return would not have been permissible. That’s also why debt has the right to initiate bankruptcy procedures, in case of failure service the debt, as debt is not granted such ownership component that can act as a safety net, or such voting right that can act as a co-decision right regarding the use of free cash flow and dividend distribution.

This part will thus try to think less in terms of the polarized standards of equity and debt. If less discretion is involved in the payoff, then the obviousness of an ownership right that is otherwise included in equity can also be reconsidered. While the previous paragraph explained how that ownership right (and the attached voting and liquidation rights) acted as a safeguard, this safeguard may be dropped if other more safeguards are introduced – namely more certainty over repayments. For instance, revenue sharing agreements may offer a percentage of every euro of the turnover to the investor, just

⁵⁸⁰ Chris Cook, ‘Asset-Based Finance: “Open” Financial Capital’ <<http://www.opencapital.net/papers/openfinancialcapital.htm>> accessed 16 April 2014.

⁵⁸¹ Poitras (n 439).

like the practice of royalty rights over intellectual property licenses or over state-provided licenses (i.e. mining rights).

Giving up property in a company also creates psychological thresholds, especially for European entrepreneurs. The idea of giving up ownership is very frightening, and searching for alternative means of investment that do not give up ownership may therefore be interesting to explore to overcome the psychological hurdle. And while this is interesting for the entrepreneur, also small investors may offer less value to the ownership component as their vote is sometimes too insignificant anyway and as they may merely be interested in the opportunity to gains from price increases of their investment instrument in the secondary market. For active and major shareholders and for corporations that consider their participation as a form to access a complementary resource or as a real option towards that (through an acquisition), this does of course not apply.

Another advantage of such hybrid instruments is the reduced need to value them in case of secondary transactions, and the reduced difficulty to valuation them in a primary or secondary transactions in general.⁵⁸² The infinite nature of equity requires valuation methods that are either based on the dividend repayments (with a terminal value beyond a certain time horizon to reflect the infinite going concern nature) or valuation methods that are based on the market as a whole or on anchoring points with other observations of valuations in similar cases. The temporary and self-cancelling nature of a revenue sharing instrument can then allow an easier valuation that is based on the repayment capacity, but without the need to come to an uncertain terminal value.

One question that will raise difficulties in revenue sharing arrangements, are however the repayments. Repayments will thus not be fixed (like standard debt), but also not be paid out of free cash flow (like dividends that compete for reinvestment in the company instead of being paid out). Above, I already described revenues as anchoring point, just like royalties for license over intellectual property or over state provided concessions. However, this then raises the question of what percentage should be chosen. Also, external uncertainties make revenues very unpredictable. The lifetime of the sharing instrument then also allows multiple possibilities – possibly combined with variations over time in the sharing percentage. If the repayment is slower than expected due to low revenues, the sharing percentage can increase. But it may also be possible to extend the lifetime if the repayments at a (fixed) sharing percentage are lower than expected due to lower than projected revenues. How much revenues should still be shared, once all outstanding capital has been repaid is also an aspect that needs to be decided and agreed on. Also, just like debt and equity instruments, some option rights may be included to protect against adverse conditions (i.e. conversion rights).

Estimating the future performance is essential to make this new problem then manageable. The downside may be that this payoff structure will rather be suitable for

⁵⁸² For the valuation of pre-revenue companies, and its associated problems, see for instance: Karen E Klein, 'Valuing an Early-Stage Company' [2010] *BusinessWeek: small_business* <http://www.businessweek.com/smallbiz/content/apr2010/sb20100429_990157.htm> accessed 17 January 2013; Joseph A McCahery and Luc Renneboog (eds), *Venture Capital Contracting and the Valuation of High-Technology Firms* (Oxford University Press, USA 2004).

companies that have foreseeable revenues. This may not be the case for every high tech company that still needs to overcome the so-called “valley of death”, and certainly not for companies that are trying to commercialize “blue sky” scientific applications that will still need many years of research and development before the product can be launched under unpredictable and uncertain market adoption elements.

Such investment instrument can also be linked to the revenues of one specific project of a company. Before the emergence of the first corporations, ship voyages were also financed on a project-per-project basis, and this practice has since then lost much attention. However, project-based finance still takes place in domains like infrastructure finance, movie finance, hotel finance, oil and gas exploration, cable networks, tollroads and mining.⁵⁸³ There, the practice of customized revenue sharing arrangements is frequently applied together with the practice of securitization (future flow securitization in this case). In these domains, it is a common practice that the (re)payments of principal and interest take place based on the proceeds of the project, and these will therefore often be based on revenue instead of being fixed. Thus, to enter into the debt agreement, the investors judge the revenue generating nature of the project instead of the asset. These projects are generally of such a large scale, that high transaction design costs are justified.

An example is a hotel refinancing transaction for ten UK-based hotels, by Hilton. The ten hotels are sold for £336 million towards a partnership between Hilton, a property group, a hotel investor group and Bank of Scotland. A leaseback arrangement then pays a turnover-based lease during 27 years, with a c£17.5 million minimum threshold.⁵⁸⁴

A substantial problem with such revenue sharing arrangements is their compulsory classification as either debt or equity for tax purposes. The debt-equity standardization has indeed also propagated in other sets of lawmaking, besides company laws. Tax laws are a prominent set of laws where those debt and equity standards return. However, since revenue sharing instruments have properties of both debt and equity, this creates substantial ex-ante uncertainty. Especially in cross border situations can this be problematic. A root of the problem lies particularly in the different taxation of debt and equity.

1.4.1. Revenue sharing arrangements in the continuum of hybrids between debt and equity

Revenue sharing arrangements can be put in the middle of the continuum with hybrid instruments that are situated between debt and equity. The spectrum of hybrid instruments ranges from corporate shares with features that derive from loans (such as preference shares) to loans with features usually associated with equity investments (such as participation in profit and loss). The payoff of contractual and thus non-

⁵⁸³ James Otto and others, *Mining Royalties: A Global Study of Their Impact on Investors, Government, and Civil Society* (World Bank Publications 2006).

⁵⁸⁴ Alistair Osborne, ‘Hilton Proves Value with Sale and Leaseback of 10 Hotels’ *Telegraph.co.uk* (05:23) <<http://www.telegraph.co.uk/finance/2772150/Hilton-proves-value-with-sale-and-leaseback-of-10-hotels.html>> accessed 11 April 2014.

dilutive investment instruments (like debt) can be customized as such that they can be deferred in case of cashflow problems, or that they can also participate in the upside. Such arrangements would include inter alia *jouissance* rights, silent partnerships, convertible loans, loans with warrant options, profit participation loans.

Some of these arrangements may have solely a contractual nature, while others may have a qualification under company law. The advantages of being classified as an instrument under company law may be:

- Transferability may be easier than the transfer of contractual arrangements, as different formalities may exist (i.e. the transfer of a lender may in some countries be bound to a formality that the debtor should be informed)
- The label is often taken over in other laws and regulations, and that creates legal certainty

There are also some disadvantages and some limitations that a classification as an instrument under company law may bring: namely the required compliance with mandatory rules. For example, voting rights cannot always be taken away (as in Denmark, Netherlands and Sweden for example). Or different classes of equity are not allowed under every company law. Also, the classification of an equity instrument under company will by default imply a lack of repayment obligations (in theory only at the moment of winding up a company). That does not mean that this default equity may not be customized, or that side contracts may effectively deviate from some default situations.

Such labels under company law should not necessarily be bonds or shares. Also other labels like participation rights, participation certificates, promissory notes or dividend right certificates may be foreseen.

But for the non-corporate instruments, partnership participations have already been described before, and they can be fully tailored to have revenue sharing or debt like properties, instead of residual pay-off properties. The same is true for silent partnership stakes, a notion that is in use in some countries to point to the partner who only provides financing or assets but who does not engage in management and who does not take up responsibilities beyond his capital or asset commitment. Such silent partnerships are often entity types without legal personality – and the silent partnership notion then allows limiting the liability of such silent partner in contrast to a managing partner who is fully exposed. The existence of a silent partner is typically also not disclosed to third parties, although this secretive nature is not really the goal in this context. Some tax treaties even contain specific elements to classify silent partnership stakes.

Also debt customization can cut the link between the initial money contribution and the “repayments” and make the payments perpetual for instance. Debt is typically seen as an obligation to pay a certain sum at a fixed maturity date along with a fixed percentage of interest.⁵⁸⁵ But this can actually be fully customized.

⁵⁸⁵ N Wiedermann-Ondrej, ‘Tax Treatment of Revenue Based Payments’ [2007] Available at SSRN 1137832 <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1137832> accessed 20 January 2013.

A common customization, or rather side option, is that of a conversion right (or trigger) to switch debt to equity or equity to debt. However, this often results in shifting from one extreme to the other one, when the conversion takes place. For instance, in a loan, a conversion option to exchange the note for shares, may be included (in which case the interest rate will normally be lower than normal debt/loan, given the potential value of this additional option right), as well as an automatic conversion trigger in case of a substantial investment (but a conversion discount is regularly offered to the holders of the convertible notes, as a sweetener). At that point, the outstanding balance (outstanding repayments and outstanding interests) converts to shares. Convertible debt is regularly used and it can delay the valuation question until a moment when a substantial amount of capital is raised later on (the initial convertible debt investor will normally receive a discounted conversion rate, but will otherwise be subject to the valuation of that later round). Such a conversion option may also be included in a contractual arrangement. For instance promissory notes may offer an option to obtain debt or equity in the company – while the promissory note will cease to exist.

1.4.2. *The debt-equity continuum⁵⁸⁶ in a fiscal and accounting world*

Revenue sharing arrangements have however a poor support in our legal infrastructure. Only two types of securities are generally considered in securities regulations, tax laws and accounting laws around the world: debt and equity. Hybrid forms of debt and equity that have characteristics of the other security (equity or debt respectively), will still be forced to classify as one of those two standards for tax and accounting reasons. This is problematic and creates uncertainty. Especially on a cross border level, as different countries can use different principles and approaches to classify the instruments, and that poses perhaps the biggest problem. It may also create an opportunity for tax planning, but at the same time, and besides the uncertainty, it can also create a risk for double taxation. Multiple authors consider this forced binary choice between debt and equity as unjustified⁵⁸⁷, or at least too rigid. But at the same time, it is very difficult to let countries coordinate how to distribute taxation powers as

⁵⁸⁶ The notion comes from Andriy Krahmal, 'International Hybrid Instruments: Jurisdiction Dependent Characterization' (2005) 5 *Houston Business and Tax Law Journal* 98.. See however also other authors on the binary world, or the line between debt and equity in tax situations: Herwig J Schlunk, 'Little Boxes: Can Optimal Commodity Tax Methodology Save the Debt-Equity Distinction' (2001) 80 *Texas Law Review* 859.

⁵⁸⁷ See for instance Katherine Pratt, 'The Debt-Equity Distinction in a Second-Best World' (2000) 53 *Vanderbilt Law Review* 1055; Joseph Allen, 'Seeking True Financial Reform: Ending the Debt-Equity Distinction' (2012) 3 *William & Mary Business Law Review* 243; Adam O Emmerich, 'Hybrid Instruments and the Debt-Equity Distinction in Corporate Taxation' (1985) 52 *The University of Chicago Law Review* 118; Edward D Kleinbard, 'Equity Derivative Products: Financial Innovation's Newest Challenge to the Tax System' (1990) 69 *Texas Law Review* 1319.; Brian Curtis Wood, *Financial Innovation and the Debt/equity Distinction in Corporate Taxation* (University of Texas at Austin 1987).

there is always a very low willingness to accept constraints on the powers to tax – a problem that the European Union also experiences.⁵⁸⁸

Revenue sharing is a very common practice in licensing arrangements, and such royalty payments for intellectual property rights and state provided concessions also specifically receive a separate classification and treatment under tax and accounting laws – as a third form besides interests and dividends. But this classification is really mostly reserved for license payments over intellectual property and state provided concessions, and not for revenue dependent payments in return for a monetary investment. Those then still default to the uncertainty of being classified as either interest or dividend taxation.

A number of elements can be used to classify the revenue-dependent return payments, as either debt or equity:

- The form or the naming of the instrument can be used to decide on the classification, instead of using the economic substance. This offers parties the possibility to effectively choose the tax treatment.⁵⁸⁹ And while it may seem bizarre that similar situations can be put in different formal representations, it can render taxation systems very administrable when substance-over-form tests and disputes can be saved.⁵⁹⁰
- A categorization based on the dominant factors in the instrument, namely dominantly factors that are typical for debt, or dominantly factors that are typical for equity. In case of a cross-border payments, it creating however a risk that it might be classified differently at the level of the investee and the level of the foreign investor. It certainly creates uncertainties and costs as parties cannot necessarily know upfront how their transaction will be treated.
- A specification of typical debt or equity factors can be incorporated in the tax laws of a country, and as soon as one or more of these determining factors is met, then the instrument also classifies as debt or equity. This still does not rule out uncertainties for instruments that have characteristics that meet the defining factors of both instruments.
- Or it is also possible to split the debt and equity components of a transaction (a practice which is called bifurcation), and to tax those components separately.

Attributes to classify or separate them as debt or equity include such things as the source, priority, surety and frequency of the payments, as well as control rights that are awarded to the holder (i.e. voting rights). For instance, in the United States, the classification is done on a “factor-based” approach. These factors and how they

⁵⁸⁸ William W Bratton and Joseph A McCahery, ‘Tax Coordination and Tax Competition in the European Union: Evaluating the Code of Conduct on Business Taxation’ (2001) 38 *Common Market Law Review* 677.

⁵⁸⁹ See for instance Alvin C Warren, ‘Financial Contract Innovation and Income Tax Policy’ (1993) 107 *Harvard Law Review* 460.

⁵⁹⁰ Krahnal (n 586).. Also note, this policy choice between either a system that is easy to administer, or a system where substance of form prevails, can be observed in the policy choices that Eastern European countries made, when communist regimes were reversed. Formalistic systems create an incentive to engineer transactions that comply with a certain set of desired formal classifications, but that may be far removed from the intrinsic economic goal.

determine the classification as either debt or equity, are found in court cases and in the Internal Revenue Code.⁵⁹¹ The Internal Revenue Service also issued a notice in 1994, with key factors to determine a classification between debt and equity:

- If there is a fixed or reasonably foreseeable maturity date, or if the instrument is perpetual
- If the payment is enforceable, or is there is an unconditional promise to pay
- If there is subordination of the rights of a holder to the rights of general creditors
- If there is a right for the holders to participate in the management
- If there is so-called “thin capitalization”
- If the identity of the shareholders and the holders of the instruments is the same
- If the name that the parties give to the instrument is either debt- or equity based

Other (potential) factors would be the existence or lack of a convertibility right, other control rights than direct managerial influence, redemption rights, etc.

Other countries also have similar criteria listed in reports and notices from the tax authorities. For instance Sweden’s Tax Office (Riksskatteverket) lists criteria in report 1990:1 that may allow reclassification of debt as equity for tax purposes. The criteria are mainly focused on thin capitalization situations, but the last element substantially forces revenue sharing arrangements into a classification as equity:

- The existence of atypical debt to equity ratios in the investee
- Interest rate that deviate from normal arm’s length situations in the market
- If there is a convertibility right attached to the instrument
- If there is proportionality amongst the shareholders
- The question if there is an enforceable obligation to pay back the principal
- The existence of profit-dependent interest or a profit participation generally

Many (re)classification guidelines indeed exist under the form of anti-avoidance rules, like those thin capitalization rules. Other examples may exist to prevent that debt is used to avoid corporate taxation over dividends. Such avoidance takes in practice rather place when the investor and investee are related parties.

However, rarely is there any legislative line to decide if an instrument classifies as debt or equity outside such situations. In many countries, the only fact of having a profit participating feature in the loan, does not result in a straightforward (re)classification as a dividend or interest. Germany is an exception, as withholding taxes for dividends do also apply to profit-participating instruments.⁵⁹² But profit participating instruments are otherwise rarely expressly recognized by tax laws. Also, if a country would draw that line in a statutory way, compared to case law and notes and reports from the national tax authorities, it would still create a situation of legal uncertainty in an international setting, as other countries will not necessarily honor this source or home country classification.

⁵⁹¹ IRC §385(b)

⁵⁹² Eva Eberhartinger and Martin Alexander Six, ‘Taxation of Cross-Border Hybrid Finance - A Legal Analysis’ (2009) 37 Intertax 4.

Even if classification factors are available, there may be differences if one factor alone may be conclusive for a classification as debt or equity, or if it requires a weight of a number of factors to lead to such qualification. In some countries, a perpetual “loan” may actually have crossed the line of equity instruments entirely, while this alone will not be conclusive in other countries. This aspect is a very equity-like aspect, in the way that debt normally ends at a fixed time, under most market practices, whereas equity is of a perpetual nature.

I already expressed earlier that profit participating instruments may be freely designed on such levels (just like debt), due to their contractual nature. For instance, as fixed time instruments, fixed maximum repayment instruments (with no definite repayment date, but at least a fixed repayment sum) or also as perpetual instruments with no fixed provisions of termination or without a right of the debtor to terminate the arrangement. The need for repayment may also exist in principle, but may be postponed indefinitely as long as certain contractual conditions remain fulfilled. This automatically makes the creditor subject to the risk of the underlying business, in the long run. However, a combination of the revenue participation, and a perpetual right may offer enough elements for a classification as equity if only one of those elements would not have been conclusive yet.

The qualification into equity may also be intention based, namely if there is no intention to repay a loan, despite a contractual obligation (that may for instance never be enforced).

Theoretically, there may even be a different accounting treatment, compared to the tax treatment. An instrument may for instance not appear in the balance sheet as debt or equity, while it is classified as debt or equity for tax purposes. A loan may be classified as debt for tax purposes, but as equity for accounting purposes, and the same is certainly true for a hybrid instrument like a revenue sharing arrangement.

Hereafter, I will have a deeper look at the uncertainties in a cross-border setting. In fact, dividend classification is in the interest of the source state, and debt in the interest of the state of residence. Interest is generally not taxed in the source country. There is therefore an incentive for tax authorities to prefer one classification to another, irrespective of the logic of the factors that have been expressed above. Treaties may offer certainty, as a tax treaty needs to be interpreted autonomously and independently from the contracting nation’s national classifications (unless a reference is made to them in the treaty).⁵⁹³ A treaty may qualify a revenue-based stream as dividend or interest. But this is only important for the attribution of taxing power (potentially with a limited taxation power to the other state) – once a tax treaty has attributed the taxing power to one state then that treaty does not forbid that that state reclassifies the income stream to its most lucrative interpretation. However, those model treaties will in general keep the uncertainty unchanged in the first place, like I will describe with the OECD model double tax treaty below.

⁵⁹³ Michael Lang, ‘Austria’ [1993] Cahiers de droit fiscal international 197; Michael Lang, ‘Irrwege Der DBA-Auslegung Am Beispiel Der Besteuerung von Lehrbeauftragten’ (1998) 508 SWI 1998.

Before looking at the OECD model double tax treaty situation, a European situation may be considered. In a European setting, there may exist a level of certainty for cases that fall under the scope of the European Parent Subsidiary Directive. This directive applies to “profit distributions”, and these may in fact also be income from hybrid instruments if the source state or a tax treaty between the source and residence state treat an income as dividend. However, pure interest (and royalty) payments should in fact not be within the scope of the directive. These are covered by the directive 2003/49/EC concerning the taxation of interest and royalty payments. The latter directive clarifies however that hybrid financing should be excluded from its scope, and should be handled within the scope of the Parent Subsidiary Directive that covers profit distributions instead. Literally, it excludes these payment streams from a classification as debt and royalties, and pushes them towards the directive that treats them as dividends:

- Income treated as profit distributions
- Income from debt-claims, participating in profits
- Income from debt-claims which entitle the creditor to convert the right to interest to the right to participate in profits of the debtor
- Income from debt-claims with no terms about the repayment of the principal amount

The OECD double tax conventions are however the most important source to look at for cross-border taxation situations. The widely used OECD model double tax treaty does unfortunately not offer full certainty to classify hybrid instruments as either dividend or interest. The OECD model tax treaty has broad definitions for both dividend (article 10(3) as well as interest article 11(3)). This broadness creates an overlap, and it is exactly this overlap that maintains the uncertainty to classify revenue sharing arrangements:

Article 10 (3) defines dividends as:

- Income from shares, “jouissance” shares or “jouissance” rights, mining shares, founders’ shares or other rights not being debt-claims, participating in profits;
- As well as income from other corporate rights, which is subjected to the same taxation treatment as income from shares by the laws of the State of which the company making the distribution is a resident.

And interests under article 11 are generally considered to be remunerations for making capital available, by literature on this subject.⁵⁹⁴

The commentaries solve this overlap somewhat in favor of dividends, as long as the definition of interest in article 11 is understood to exclude everything that is already listed under dividends in article 10.⁵⁹⁵ Making them mutually exclusive⁵⁹⁶, and giving dividends priority, may eliminate any form of overlap. And the scope of the dividend

⁵⁹⁴ Klaus Vogel, *Klaus Vogel on Double Taxation Conventions: A Commentary to the OECD-, UN-, and US Model Conventions for the Avoidance of Double Taxation on Income and Capital, with Particular Reference to German Treaty Practice* (Kluwer Law International 1997).

⁵⁹⁵ Recital 19

⁵⁹⁶ Michael Lang, *Hybride Finanzierungen Im Internationalen Steuerrecht* (Orac 1991); Franz, Eilers, Stephan Wassermeyer, *Doppelbesteuerung OECD-Musterabkommen, DBA Österreich-Deutschland ; Kommentar* (Linde 2010).

definition is already sufficient to include revenue sharing payments, due to the sharing of risks element. This suggests a conclusion to classify them as dividends and not interests.

However, even this suggestion under the commentaries is not conclusive as article 11(3) allows interest to safely participate “to participate in the debtor’s profits”, while still staying interest. A similar notion exists under article 11(2) of the UN model treaties. The commentaries even reinforce that notion that interests remains interest – even if it participates in profit, under the condition that “the contract by its general character clearly evidences a loan at interest”

Thus, when there is no classification that suggests a form of interest, then the exclusion principle pushes a revenue sharing arrangement into the classification as dividend. However, as soon as a classification as interest exists, even with profit participation (even revenue participation), then this maintains a classification as interest unless more dividend-like elements are attached to it besides this participation.

Another element that may reinforce the doubt, and that may still keep a classification as debt open, is that payment streams from “corporate rights” will be dividends (thereby referring to the law of the source state which therefore becomes part of the treaty). Earlier, I already highlighted that most revenue sharing arrangements will have a contractual existence unless company laws classifies them under a specific label. Corporate rights can also participate in liquidation proceeds, after creditors have been paid. But as creditors have this priority, they can potentially leave no room for liquidation proceeds towards corporate right holders. At least they can have a form of recovery, although potentially only partially. But corporate right holders can possibly lose everything. While contractual rights can be designed to participate in the upside as well, some may consider bearing the ultimate risk as an essential element that separates corporate rights from contractual arrangements.⁵⁹⁷ Their payoff is ultimately subordinated.⁵⁹⁸ Nonetheless, interpretations exist that may let an investment qualify as equity if the exposure of loss is rather comparable to the loss that a shareholder would have.⁵⁹⁹

Thus, model double tax treaties do not necessarily exclude all uncertainty. Some individual double tax treaties may however provide certainty where model treaties left uncertainty. Tax treaties with the US classify rights that participate in profits and that are not debt-claims, as equity (and dividends) – however as soon as the source state classifies a payment stream as dividend (even if the treaty may consider it as a return for a debt-claim), the these treaties with the US follow this dividend classification for the residence state. Tax treaties with Germany include for instance provisions on participations as silent partner in silent partnerships, or other profit sharing

⁵⁹⁷ Federico M Giuliani, ‘Article 10 (3) of the OECD Model and Borderline Cases of Corporate Distributions’ (2002) 56 *Bulletin for International Fiscal Documentation* 11; Vogel (n 594); Lang, *Hybride Finanzierungen Im Internationalen Steuerrecht* (n 596).

⁵⁹⁸ Marjaana Helminen, *The Dividend Concept in International Tax Law: Dividend Payments between Corporate Entities* (Kluwer Law International 1999); Lang, *Hybride Finanzierungen Im Internationalen Steuerrecht* (n 596); Vogel (n 594).

⁵⁹⁹ Helminen (n 598); Vogel (n 594).

mechanisms that are contingent on the performance of the counterparty.⁶⁰⁰ The German-Austrian double tax treaty tells for instance:⁶⁰¹

"The term "dividends" includes also income derived by a silent partner ("stiller Gesellschafter") from the partner's participation as such, income from participating profit sharing loans ("partiarisches Darlehen") or profit sharing bonds ("Gewinnobligationen") and similar remuneration provided it is not deductible in determining the taxable income of the borrower under the laws of the Contracting State in which it arises, as well as distributions on share certificates in an investment trust."

As a last side-note, it may be good to question the tax distortion and tax difference between equity and debt investors at its most fundamental level. Their different taxation regime creates a level of distortion in the financing of firms. The Modigliani-Miller theorem states that, if specific conditions hold (i.e. the absence of agency problems, bankruptcy costs, asymmetric information, taxes, or market inefficiencies), a firm is indifferent between various sources of financing (either issuing stocks or taking on debt).⁶⁰² But in reality, debt is tax friendlier for the company.

Dividend payments are first subject to a corporate taxation, while interest payments over loans are not subject to any corporate taxation before they are distributed – the distribution will instead trigger a taxation at the level of the lender or a withholding tax that serves as an advance for the taxes that are due by the lender (or that cannot be taxed at the level of the lender due to his nonresidence status). Different taxation at the level of end investors is believed to compensate this difference.

Although the total taxation may in the end be reasonable similar for both financing types, the taxation of dividend will reduce the after-tax value of a firm when it is financed with equity. From the company's point of view, this is not the case when debt is used instead. The value of the leveraged firm (a firm which also has debt) then increases with the corporate taxation that is saved from that proportion of debt (often called the "debt shield"). The value of a leveraged firm may even increase more as debt reduces the chances of agency problems (and consequently, the need to anticipate them with a lower valuation): in contrast to equity, debt limits the free cash flow that managers can otherwise use to behave opportunistically.⁶⁰³

Nonetheless, there is a countereffect: completely financing a company through debt will not maximize the value either as debt issuance has a signaling effects. On the one hand, issuing debt can indicate that the firm is confident about its repayment capacity.⁶⁰⁴ But

⁶⁰⁰ Wolfgang Schön, 'International Tax Coordination for a Second-Best World (part II)' (2009) 1 World Tax Journal 67.

⁶⁰¹ Martin Six, 'Hybrid Finance and Double Taxation Treaties' (2009) 63 Bulletin for International Taxation 22.

⁶⁰² Franco Modigliani and Merton H Miller, 'The Cost of Capital, Corporation Finance and the Theory of Investment' (1958) 49 The American economic review 261.

⁶⁰³ Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital. See: Michael C Jensen, 'Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers' (1986) 76 The American economic review 323.

⁶⁰⁴ Stephen A Ross, 'The Determination of Financial Structure: The Incentive-Signalling Approach' (1977) 8 The Bell Journal of Economics 23.

on the other hand, it can indicate that the firm lacks internal resources and is dependent to debt markets, which can lead to an adverse selection problem (i.e. a lemons market for where all debtors are considered as such firms that lack sufficient resources, and firms that do have such resources but that want to use debt for reasons like the tax advantage will not want to be assimilated with such bad firms and will therefore leave the debt market).⁶⁰⁵ Thus, while this may again favor equity. But that also has signaling effects. In a non-negotiated setting (publicly traded firms), the announcement to sell equity can be interpreted that the equity is overpriced at that moment (because a company has an incentive to choose the instrument to raise capital that offers the lowest cost of capital or that can be sold at the highest relative price). Therefore, the optimal debt level is set to the point where the marginal benefit of an additional unit of debt equals its marginal cost.⁶⁰⁶

These signaling effects are however rather relevant for publicly traded firms, where pricing of the tradable instruments can be influenced by market sentiment and perception rather than interaction with the firm. This chapter focuses however more on investment situations where the small number of investors allows a personal interaction with the firm – and where one needs to rely less on impersonal signals. In general, this study focuses on companies that do not have the luxury to chose between debt or equity. Technology driven growth firms for example, appear to gain little from the tax shield because they have no income to deduct against. A general deduction for interest does not benefit those firms, but firms that already have access to external debt. Also if they issue debt, they risk too much as the external uncertainties under which they operate, make it very difficult to predict to what extend they will be able to service debt on time.

The debt bias does thus create a distortion, for firms that have a choice between debt and equity, and especially for firms that are subject to signaling effects. Also, the debt bias may stimulate debt, leading to a risk from a societal welfare point of view as debt also creates systemic risks.

Partnerships are not plagued by this debt bias and tax distortion, as these are tax-transparent in many jurisdictions. However, instead of only choosing partnerships for their tax neutrality, which should confirm a tax distortion, one may motivate that other structures should also be tax transparent to take this distortion away. Indeed, one may wonder if this tax neutrality should be available to corporations and company types as well. Different solutions have been suggested in that direction.

⁶⁰⁵ This adverse selection problem led to the pecking order theory of Myers and Myers and Majluf that firms will favor internal equity over debt and debt over external equity (because given that new shares shall not be issued if a firm is undervalued, the issuance of new shares is interpreted as a sign that the company is overvalued). See Stewart C Myers, 'The Capital Structure Puzzle' (1984) 39 *The Journal of Finance* 574; Stewart C Myers and Nicholas S Majluf, 'Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have' (1984) 13 *Journal of Financial Economics* 187.

⁶⁰⁶ Serena Fatica, Thomas Hemmelgarn and Gaetan Nicodeme, 'The Debt-Equity Tax Bias: Consequences and Solutions' (European Union 2012) 22
<http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_33_en.pdf> accessed 3 May 2013.

One remedy may be the Allowance for Corporate Equity (ACE), which makes a notional return on equity deductible, just like deductible interests. It makes income that is financed with debt or equity almost equally from a tax point of view. It does not deduct them completely equally however, as the allowance for tax deduction of returns from projects that are financed by equity is only allowed up to a notional limit. That appropriate notional return is for instance a set risk-free nominal interest rate, for instance equal or comparable to that of government bonds.⁶⁰⁷ The ACE system was originally proposed by the Institute for Fiscal Studies.⁶⁰⁸ Several countries have experimented with ACE. Today, Brazil, Latvia, and Belgium apply variants of ACE.

Even more neutral, theoretically, is the allowance for corporate capital (ACC). Under the ACC, the interest deduction is abolished. But instead of making every return non-taxable on the corporate level, there is one deduction for the notional risk-free return on all capital. This then applies irrespective of whether the return comes from a project that was financed by debt or equity.⁶⁰⁹ The ACC makes the choice between debt and equity neutral from a tax point of view. Another fully neutral possibility would be to make interests not tax deductible, and to apply corporate taxation to them just like returns from projects that are financed through equity. Instead of offering an debt shield like allowance for equity, one can then talk of a comprehensive business income tax. Many European countries have introduced thin-capitalization rules that limit interest deductibility. These tend towards comprehensive business income tax.⁶¹⁰

2. Investor-investment manager relationship

Investing in high growth businesses mostly takes place with the help of professionals for screening, selecting, managing, advising and monitoring: venture capitalists. The dominant model is through venture capital funds, a blind pool where the venture capitalists have full control over the screening, selecting, managing and monitoring. In the early days of the industry, one could also observe asset pools where such professionals screened and selected deals but where investors than had the choice or control to subscribe or not. Such mechanisms can still be found in investment banking (for instance for an IPO or for a private placement), in co-investments between venture capital funds or venture capital funds and corporate or other side-investors, and in business angel networks.

⁶⁰⁷ Stephen R Bonds and Michael P Devereux, 'On the Design of a Neutral Business Tax under Uncertainty' (1995) 58 *Journal of Public Economics* 57.

⁶⁰⁸ Michael Devereux and Harold Freeman, 'A General Neutral Profits Tax' (1991) 12 *Fiscal Studies* 1.

⁶⁰⁹ Robin Boadway and Neil Bruce, 'A General Proposition on the Design of a Neutral Business Tax' (1984) 24 *Journal of Public Economics* 231.

⁶¹⁰ Ruud A de Mooij and Michael P Devereux, 'Alternative Systems of Business Tax in Europe: An Applied Analysis of ACE and CBIT Reforms' (European Commission 2009) 17 <http://ec.europa.eu/taxation_customs/resources/documents/common/publications/studies/acecbt_study.pdf> accessed 18 April 2014.

Venture capitalists exercise virtually complete control over their portfolio investment decisions. But this mechanism has recently lost some of its reputation, as some investors wonder if investment managers are making money from investors or making money for investors.⁶¹¹ Or even towards the portfolio companies are there issues, like the pressure for perhaps a premature exit (the industry standard return metrics favor early exits).⁶¹² And the fees that such funds charge are expensive and they increase the potential for misalignment. I will discuss the opportunistic hazards that exist in this model. Another problem may be an incentive to maximize the performance at the time when follow-on funds are raised, which is done before the end of the fund's lifetime, and which takes place in a situation where the current performance information is still incomplete.⁶¹³

Under such stress and a trend that criticizes their role, venture capitalists may experience a changing role and they may face investors with more bargaining power.⁶¹⁴ Their capabilities remain welcome in the market, but perhaps in a more unbundled format. The investor may for instance prefer to invest directly in the investee, with an investment manager who operates parallel to this relation, as a specialized and complementary service provider. Then, that manager can also act for one or more investors in different or all investment phases.

Investors now have a higher desire to maintain decision power. Unbundled business models also lower the possibilities for opportunistic hazards. However, such new business models (i.e. asset pools again) struggle with a low acceptance rate under the legal framework, especially for countries that default to corporations instead of partnerships to structure pools. For such countries, I suggest how segregated portfolio companies, protected cell companies or segregated cell companies and umbrella fund systems can offer an outcome.

2.1. Emergence of managed venture capital investments

A number of institutionalized financial professionals have emerged to intermediate between companies and end investors that have available capital to allocate to such companies (in return for a risk adjusted return). Banks that perform maturity transformation on loans are one example. But on the level of equities, merchant banks in London would become known worldwide for sourcing money for equity investments with end investors, to invest in businesses. Forms would also emerge, where the

⁶¹¹ Diane Mulcahy, Bill Weeks and Harold Bradley, 'We Have Met the Enemy... and He Is Us: Lessons from Twenty Years of the Kauffman Foundation's Investments in Venture Capital Funds and the Triumph of Hope Over Experience' (Ewing Marion Kauffman Foundation 2012) <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2053258> accessed 18 April 2014.

⁶¹² Ludovic Phalippou, 'Beware of Venturing into Private Equity' (2009) 23 *Journal of Economic Perspectives* 147.

⁶¹³ Eugene Kandel, Dima Leshchinskii and Harry Yuklea, 'VC Funds: Aging Brings Myopia' (2011) 46 *Journal of Financial and Quantitative Analysis* 431.

⁶¹⁴ Joseph A McCahery and Erik PM Vermeulen, 'Recasting Private Equity Funds after the Financial Crisis: The End of "Two and Twenty" and the Emergence of Co-Investment and Separate Account Arrangements' (2013) ECGI Law Working Paper 231/2013 <<http://papers.ssrn.com/abstract=2351816>> accessed 12 December 2013.

pooling takes place at the level of an intermediate fund that is then managed by investment managers that decide where the money will be allocated to, in a way that is blind for the investor (unless they stipulate some level of control).

Some of these early pools traded for their own account, and didn't have to attract external capital from investors. In Venice, Genoa and Amsterdam, it already happened that charities had substantial capital under management, which was already used to invest in public securities very early (before the existence of securities like shares in joint stock companies). Also early insurance funds that held securities (shares in joint stock companies) existed as early as the 17th and 18th century in Holland.⁶¹⁵ City guilds in Holland then already ran mutual funds that also included stocks of the Dutch East Indian Company, to fund their welfare expenditure towards members – these mechanisms were initially created as an insurance mechanism in order to provide for the sick members.

Early private and voluntary poolings were structured as contractual mechanisms: for instance under a tontine contract. This became a standard practice, which resulted in widely used (quasi-standard) tontine terms: by 1687, almost 200 such contracts were already used for such pooled investment purpose.⁶¹⁶ People would enter into a tontine contract and would buy a block of securities: the dividends would be shared amongst the individuals until their death. Tontines are a pooled life annuity where the benefits accrue to the survivors (death reduces the number of participants, and thus benefits the survivors – it is an instrument that originated in Italy⁶¹⁷). Especially for the insurance purposes was this a suitable instrument.

Later, commercial funds would emerge that actually raised capital with the sole purpose to invest and to generate a return. They offered an access to the securities market for savers that would otherwise be unable or unwilling to enter them.⁶¹⁸ Amsterdam would also continue to be the trendsetter in the 18th century for those innovations. In July 1774, Abraham van Ketwich already offered units in such fund for sale, thus under commercial circumstances, under the name of a *negotiatie*. It would however not be based on the notion of a tontine. The first one, *Eendragt Maakt Magt*, had portfolio investments in foreign government debt, banks and in loans towards plantations in the West Indies. The consequent second vehicle, *Concordia Res Parvae Crescunt* from 1779, was more of a stock-picking fund that would invest in undervalued

⁶¹⁵ Ton Langenhuyzen, 'Zekerheid En Brand Vóór 1800' in Jacques van Gerwen, Marco HD Leeuwen and HJ Neeleman (eds), *Studies over zekerheidsarrangementen : risico's, risicobestrijding en verzekeringen in Nederland vanaf de Middeleeuwen* (Nederlandsch Economisch Historisch Archief 1998).

⁶¹⁶ H Wagenvoort, 'Tontines; Een Onderzoek Naar de Geschiedenis van de Lijfrenten Bij Wijze van Tontine En de Contracten van Overleving in de Republiek Der Verenigde Nederlanden... An Examination into the History of Tontine Annuities and Contracts of Survival in the Republic of the United Provinces...' (Utrecht 1961) <<http://en.scientificcommons.org/3307010>> accessed 29 January 2013.

⁶¹⁷ H Wagenvoort, 'Contracten Van Overleving En Andere Tontines' (1967) 35 *Tijdschrift voor Rechtsgeschiedenis* 584.

⁶¹⁸ Oscar Gelderblom and Joost Jonker, 'With a View to Hold: The Emergence of Institutional Investors on the Amsterdam Securities Market during the Seventeenth and Eighteenth Centuries' in Jeremy Atack and Larry Neal (eds), *The Origins and Development of Financial Markets and Institutions* (Cambridge University Press 2009).

securities altogether, for instance future credit of the United States. It existed until its dissolution in 1893 when it was officially dissolved. Many more *negotiaties* would also start to exist.

Inspired by these Dutch funds, professionals in other countries would also start to offer similar instruments in pooled vehicles. These would also be on a non-tontine basis, as such pooled vehicles would also start to be offered on a commercial basis. In Austria, Switzerland and the United Kingdom for instance, such structures would use the notion of trust. For instance early unit trusts in Austria, where Jean Deutz and Soon and later also other firms sold commercial loans to funds of which the units were offered for sale (an early form of securitization, indeed).⁶¹⁹ In the United Kingdom, the Foreign and Colonial Government Trust is credited as the first such investment trust, founded in 1868 in London.⁶²⁰ Just like the funds in The Netherlands, this trust would also invest in foreign government bonds or in loans towards other capital-intensive projects back then. For instance, Robert Fleming's First Scottish American Investment Trust invested in U.S. railroad bonds.⁶²¹ At the end of the 19th century, such funds under the form of investment trusts would also emerge in the United States. The Boston Personal Property Trust, formed in 1893, can serve as an initial example.⁶²²

In the beginning of 20th century, open-ended funds would also emerge where the investor did not have to rely on the secondary market or on the dissolution of the fund to obtain a return. Instead, it would be possible to redeem a unit directly with the fund itself. This is of course only possible when the fund can quickly react and readjust its portfolio to accommodate such redemption – this is thus only possible when the fund invests in liquid assets.

In the 20th century, funds would also more specialize in different asset classes, going from money market instruments, to bonds, to stocks. Instead of actively managed funds, passive index tracking funds would also start to emerge in the mid-70s. Such passively managed funds quickly became popular, although they do of course have their limitations terms of price discovery, and valuation, passively managed funds practically piggyback on price formation that takes place by active managers.⁶²³ For that reason, the market may possibly have a limited absorption capacity.

With the move of most funds to liquidly traded instruments, a category of firms would remain underserved, namely those whose shares were not listed, and were therefore illiquid. Private companies whose risk profile did not allow obtaining bank lending (i.e. high tech firms) could rarely sell their shares to institutional investors or such funds, despite an availability of some early powerful but still private investors.

⁶¹⁹ William N Goetzmann and K Geert Rouwenhorst, *The Origins of Value: The Financial Innovations That Created Modern Capital Markets* (Oxford University Press 2005).

⁶²⁰ Ibid.

⁶²¹ Ibid.

⁶²² Seth Anderson and Jeffery A Born, *Closed-End Investment Companies: Issues and Answers* (Springer 1992).

⁶²³ 'Index Funds Are Parasites and Are Going to Kill the Market' (*Stockopedia*)

<<http://www.stockopedia.co.uk/content/index-funds-are-parasites-and-are-going-to-kill-the-market-71683/>> accessed 1 April 2013.

By the time of the Great Depression of the 1930s, there was already a widespread perception that the existing ways of financing young firms were inadequate.⁶²⁴ Ralph Flanders, president of the Federal Reserve Bank of Boston, was at his turn concerned about the lack of new company formation and the inability of institutional investors to finance new ventures. Boston retailer Lincoln Filene would co-author a study together with Flanders, where they concluded that firms with upcoming technologies should be supported (instead of firms with old technologies). As an outcome, the New England Industrial Development Corporation was launched in 1940 to provide assistance to such firms.⁶²⁵ This also or mainly includes participating in equity. Other countries would have similar regional or national development companies, like 3i and the Industrial and Commercial Finance Corporation that was founded in 1945 in the United Kingdom.⁶²⁶ Besides such regional development initiatives, the area around Boston was however also the first region that would see an emergence of a high degree of organized forms of venture capital. An initial organizational idea for that came from Flanders.

Flanders also proposed fiduciary funds, which would enable institutional investors to invest up to 5 per cent of their assets in equity in new ventures. The proposal was supported by General Georges Doriot (professor at Harvard Business School, the president of MIT and local businessmen: Doriot established American Research and Development (ARD) in 1946. ARD made investments in young firms with a basis in technologies developed for World War II, often with close ties to the Harvard and MIT communities.⁶²⁷

Still other service providers would gradually evolve to this same model. For instance, Arthur Rock performed an investor function when Intel was searching for capital to start their operations. Individuals who would evolve from a fundraiser or searcher function to a fund manager would thus also be a source. Before the convergence to the blind pool model, their function would rather be to pool investments at the level of an individual firm, and thus creating an asset pool, instead of the level of a fund (a blind pool).

In Silicon Valley and San Francisco, groups of successful entrepreneurs began to emerge during the late 1950s and early 1960s, who invested money in companies under a syndication model (asset pools). But the more professionalized and institutionalized form would also emerge, with Draper, Gaither and Andersen as an early example (founded in 1958). The successes in Silicon Valley and the San Francisco area would create a positive feedback loop under which many more such professionally managed funds would emerge.⁶²⁸ The high returns of those early examples would not only reinforce the expansion of this model and its expensive management fees, it would also be a largely accepted model as the returns were largely sufficient to still offer a generous return to the investors.

⁶²⁴ Joseph L Nicholson, 'The Fallacy of Easy Money for the Small Business' (1938) 17 Harvard Business Review 31.

⁶²⁵ Richard L Florida and Martin Kenney, 'Venture Capital, High Technology and Regional Development' (1988) 22 Regional Studies 33.

⁶²⁶ Richard Coopey and Donald Clarke, *3i: Fifty Years Investing in Industry* (Oxford University Press 1995).

⁶²⁷ Hans Landström, *Handbook of Research on Venture Capital* (Edward Elgar Publishing 2007).

⁶²⁸ Florida and Kenney (n 625).

However, the negative returns today decrease the reliance on this model and expose a perception that the standard fees are very high. As less and less investors are willing to invest in new funds, the cash hungry managers face a worsened bargaining position. As a result, some start to work under alternative models. Such models resemble again the asset management model (asset pools instead of bling pools). Even the payment structure may be based on fixed fees, regardless of the investment results.⁶²⁹

There is still a good complementary between the professionalism of investment managers, and the end investors who may lack this expertise (or time). A greater diversity of investment structures where such professional may or may not have an investment mandate, may however face some legal barriers.

2.2. Managing the risk for managerial opportunistic behavior

A majority of investments thus take place through managed funds. The full control of the fund managers creates room for agency problems in their own right.⁶³⁰ There is again an exposure to opportunistic risks and poor performance that needs to be managed. The market practice to govern that is via contractual governance. This is understandable, as venture capital funds typically have a small or manageable number of investors and there is thus no coordination failure, not even if the individual negotiations may imply an accumulation of individual transaction costs. However, the practice has also been that funds often propose standard terms with no or little room for negotiation – which also kept the transaction cost down but which increasingly became less acceptable for investors that gained bargaining power.

Such contractual governance with a small number of counterparties leans towards partnerships as the ideal structure for a fund. In many countries, partnerships are indeed the most widely used structure. However, in continental European countries, corporations are often used. The standard protections against agency problems, as they are designed by the state in such corporate structures, are then actually overwritten or supplemented by sideletters and provisions in corporate charters.

However, the standard contract practices actually create or maintain their own misalignment problems. The standard remuneration schemes imply that the manager does not bear the downside, but only the upside. Also, it creates a situation where sufficient income can be generated from management fees alone. Venture Capitalists are typically paid a 2 percent management fee on committed capital and a 20 percent profit-sharing fee. That profit-sharing component actually aligns interests, but it is especially the management fee that creates misalignments. It creates for instance an incentive to raise big funds, and the management fees are then sufficient to live a

⁶²⁹ Udayan Gupta, 'Back to the Future for Venture Capital' [2010] *Institutional Investor* <<http://www.institutionalinvestor.com/Popups/PrintArticle.aspx?ArticleID=2388474>> accessed 25 March 2014.

⁶³⁰ Jill E Fisch, 'Securities Intermediaries and the Separation of Ownership from Control' (2010) 33 *The Seattle University Law Review* 877.

wealthy live irrespective of the performance of the portfolio.⁶³¹ Another risk besides this size issue, is the incentive to keep underperforming and hopeless participations long – even with extensions of the fund life, in order to have some substance left that justifies the management fees to live from in the meantime. This has been dubbed zombie funds.⁶³² Management fees are one of the reasons why blind pools are considered to be too expensive by many investors, especially when returns from portfolio companies are under pressure: those need to produce an average 25% return just to offset the management fee. This is a substantial compound, before it can start to offer a high return on top of that (i.e. 15% IRR) – such high net return is necessary to compensate for the risk that investing in venture capital and technology-driven companies brings.⁶³³

The persistence of such misaligned terms during many years has been caused by weak bargaining positions of investors. It was often a privilege to be able to invest in a top venture capital fund. Also, the returns were sufficient to keep the positive feedback loop working to attract new investors that could replace investors that were not willing to accept proposed terms. It are only the investors that can stop such misaligned mechanism from persisting, and their increased bargaining power (due to a negative feedback loop after depressing results since the financial crisis) may tip that balance.⁶³⁴

2.2.1. Through reputation and social sanctions

Intermediaries, such as mutual funds and pension funds, are not subject to the accountability and market mechanisms imposed by the market for corporate control and are not even subject to capital market discipline. However, reputational mechanisms are still present.

Fund managers often raise and operate multiple closed ended funds over time. The cost of creating, maintaining and signaling a reputation, which is crucial to raise new funds, serves as a direct mechanism to maintain aligned behavior.⁶³⁵ Performance is one type to create and signal the reputation. A linked mechanism for signaling quality is going public with a portfolio company.⁶³⁶ Entering syndicated deals with reputable co-investors is also a method to signal reputation (by association in this case).⁶³⁷ But this

⁶³¹ Mulcahy, Weeks and Bradley (n 611).

⁶³² Susan Pulliam and Jean Eaglesham, ‘Investor Hazard: “Zombie Funds”’ [2012] *Wall Street Journal* <<http://online.wsj.com/news/articles/SB10001424052702304444604577339843949806370>> accessed 15 March 2014.

⁶³³ Marian Moszoro, ‘The Math of Private Equity: 2/20, 3-on-5, and 1-in-8’ [2012] Available at SSRN 2017764 <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2017764> accessed 3 April 2013.

⁶³⁴ Brad Feld and Jason Mendelson, *Venture Deals: Be Smarter than Your Lawyer and Venture Capitalist* (John Wiley & Sons 2013).

⁶³⁵ Paul Gompers, ‘Grandstanding in the Venture Capital Industry’ (1996) 42 *Journal of Financial economics* 133.

⁶³⁶ Stuart, Hoang and Hybels (n 31).

⁶³⁷ Olav Sorenson and Toby E Stuart, ‘Syndication Networks and the Spatial Distribution of Venture Capital Investments’ (2001) 106 *American Journal of Sociology* 1546.

signal from syndication with a co-investor may be in the venture capitalist's interest, instead of the portfolio of investor's interest.⁶³⁸ Also the participation of investors from previous funds in a new fund, creates a powerful signal. To convince such existing investors, venture capitalists may have an incentive to present existing investors with overly good results by the time a new fund is raised.

However, the system that is used to signal performance through results of a still operating fund, is heavily flawed. The industry measure of return is the Internal Rate of Return, and the ultimate (final) IRRs of funds are generally substantially lower than the intermediate ones during the lifetime. But during fundraisings for a new fund, intermediate performance figures are communicated. Also, since information doesn't easily flow in this market, and since managers can filter this information (creating information asymmetries), end-of-fund-lifetime IRRs are difficult to obtain (unless one invested in a previous fund, or if one is able to obtain that information from one of those very few previous investors).

This is effectively a form of earning management, and the root of the problem is caused by the fact that the standard performance measure in venture capital (namely IRR – Internal Rate of Return) does not make a distinction between realized and unrealized investments. Unrealized investments are thus effectively reported as a positive cash flow, even if the future would turn out that the portfolio company could fail. And if the fund is receiving dividends from it's portfolio, then the reinvestment can be reported at the IRR itself. Also, due to the discounting factor in the IRR calculation, there is a dramatic difference between early exits and late exits: if an investment is sold for twice the original investment three years later, then this generates a 26 percent IRR. This thus creates an incentive to exit soon, even if this may offer a lower return than exiting at a more mature stage. However, if this same return would only be realized after ten years, then the IRR would be merely 7.2%. Research shows that managers strive to present high IRRs early in the fund's life (to convince investors to invest in follow on funds), but that there is no link with this high IRR and the IRR that will ultimately be reached at the end of a fund's lifecycle.⁶³⁹

2.2.2. Through contracting

A partnership agreement is central to the relationship between an investor and fund manager – or otherwise some side letters if a corporation is used. Different authors provide a useful overview of governance structures that are found in such relationships.⁶⁴⁰

⁶³⁸ Sophie Manigart and Dirk De Clercq, 'The Venture Capital Post-Investment Phase: Opening the Black Box of Involvement', *Handbook of research on venture capital* (Edward Elgar Publishing 2007).

⁶³⁹ Mulcahy, Weeks and Bradley (n 611).

⁶⁴⁰ Sahlman (n 548); Gompers, 'Grandstanding in the Venture Capital Industry' (n 635); Gompers, 'Ownership and Control in Entrepreneurial Firms' (n 549); Kate Litvak, 'Venture Capital Limited Partnership Agreements: Understanding Compensation Arrangements', *American Law & Economics Association Annual Meetings* (bepress 2004)

<<http://law.bepress.com/cgi/viewcontent.cgi?article=1075&context=alea>> accessed 18 April

It depends on the bargaining power of the investors to have some mechanisms that protect against managerial opportunism, or to mitigate the misalignment incentives that the above described remuneration structure brings. The fact that investors cannot easily exit from a participation in a venture capital fund, adds to the fact that such alignment is extremely important in venture capital settings as it creates a form of dependency and holdup.

Improved alignment can be obtained through simple mechanisms, like creating an escape mechanism from unsatisfactory management, a right to suspend contributions (today, most funds do not require the upfront payment of all committed capital), control rights over the removal of a general partner, control rights in the future conduct of a fund (potentially dissolution), limitations on competing funds or new funds (to keep focus on the existing fund), approval requirements regarding conflict transactions or transactions in general, limits on the fund's purpose; restricting the type, size, number, geographic range, risk profile, and leverage of investments, information rights, etc.

The distribution of profits and fees to managers can also be more investor friendly. For instance, a reduction in management fees to 0% if the fund is extended. Normally, funds exits for a limited time -i.e. 7 to 10 years- and in most cases the agreement contains a possibility to extend it a few times: i.e. a possibility to extend it for a year for maximum of 3 times. But it is in the interest of the investors that exits take place in a timely manner and that the management does not have monetary incentive (management fees) to extend things in an opportunistic way to create "zombie" funds with artificially valued but intrinsically dead firms. Foreseeing a scaling down once the investment period of the fund is over, can offer a better alignment. This also reflects the declining workload of the manager. Management fees are also increasingly based on invested capital, instead of committed (but not yet paid) capital.

An obligation that the manager also needs to invest a significant portion of his wealth in the fund, is also an alignment mechanism as he also becomes exposed to the losses (and gains). A standard in the domain is 1% of the fund.⁶⁴¹

But if investors have enough bargaining power, then the management fee can even be dropped altogether in favor of just covering the operating expenses⁶⁴² – where the management fees are supposed to serve for in the first place.

2014; Josh Lerner and Antoinette Schoar, 'The Illiquidity Puzzle: Theory and Evidence from Private Equity' (2004) 72 *Journal of Financial Economics* 3; Daniel Schmidt and Mark Wahrenburg, 'Contractual Relations between European VC-Funds and Investors: The Impact of Reputation and Bargaining Power on Contractual Design' (CFS working paper 2003) <<http://www.econstor.eu/handle/10419/25402>> accessed 18 April 2014; Douglas Cumming and Sofia Johan, 'Is It the Law or the Lawyers? Investment Covenants around the World' (2006) 12 *European Financial Management* 535.

⁶⁴¹ V Meek, 'Time to Deviate From the Standard?' (*AltAssets*, 13 May 2003)

<<https://www.altassets.net/features/time-to-deviate-from-the-standard.html>> accessed 23 November 2013.

⁶⁴² Mulcahy, Weeks and Bradley (n 611).

Also the 20% carry fee is subject to negotiation, if the bargaining power allows it. The managers can also be allowed to only share in the profits after the investors had received a minimum return hurdle. This is a so-called waterfall provision. A similar type of provisions are clawback provisions, that allow to reclaim already paid carries if later returns would drop below a certain preferred return. But they are not a silver bullet as they may create an incentive for early exits to cover those thresholds as early as possible in order to gain unrestrictedly from the carry thereafter. They may also be an incentive to wait overly long, in order to speculate on a higher return that may never come as a small immediate return may offer such a small net return for the manager (after reduction of the hurdle that goes to the investor) that it gives him little incentive to exit when an opportunity arises. Also, the risk for misalignment increases when it becomes clear that the threshold cannot be met – it may create an incentive for excessive risk taking (because the downside doesn't change for the venture capitalist - but it might be a difference in terms of upside). They may also completely lose their interest in the fund. To mitigate these disadvantages, parties can agree on variable carried interest.

And finally, besides including sanctioning mechanisms, also informational and monitoring systems may be foreseen but one should realize that the degree of (mis)alignment is difficult to monitor due to joint hypothesis, under the existence of external risks and uncertainties.

2.2.3. Regulations to increase confidence in funds and management, and to avoid systemic risks

Initially, fund management and marketing rules were segmented along national borders in Europe.⁶⁴³ Those impact the relationship between a fund manager and an investor, both under the form of pre-investment marketing rules (to reduce ex-ante information asymmetry) and post-investment protections against potential opportunism and self-dealing. Those then supplemented contractual protections, if available.

After the start of the harmonization efforts in Europe, however, a number of regulations would also impact this domain. Around the same time, the United States also sharpened regulations in this domain, through the Dodd-Frank Act.

However, venture capital funds have largely remained outside the scope of different regulations. For instance, if a fund was organized as a closed-ended pool, which all venture capital funds are, then the Prospectus Directive often applies since that directive does not differentiate between commercial or investment corporations (and many funds in Europe are organized as corporations). However, since venture capital fund units are almost never marketed in an open way, but rather in networks of wealthy and institutional investors, this marketing fell under the scope of the exemptions of the Prospectus Directive (as discussed in the previous part of this study).

⁶⁴³ Friedrich Heinemann, *Towards a Single European Market in Asset Management* (Investment Management Association 2003).

Also due to this closed-ended nature fell the management of venture capital funds outside the major set of directives that regulated fund management in Europe: namely the UCITS directives. Now however, the Alternative Investment Fund Managers Directive (AIFMD) regulates fund management that falls outside the scope of UCITS). However, the thresholds to fall under the scope of the AIFM directive are so substantial (€100 million assets under management in leveraged funds and €500 million assets under management in unleveraged funds⁶⁴⁴), that even most venture capital funds fall outside its scope. Also acquiring a controlling stake in small and medium-sized enterprises (SMEs) is exempted from notification and disclosure requirements.⁶⁴⁵ This is typically the activity that venture capital funds do.

That means however, that such funds would face national fund management regulations as soon as they would operate cross-border. For that, there is now a European Venture Capital Funds Regulation (EVCFR) that offers after many decades a EU-wide passport to qualifying funds. There is of course a compliance cost involved if a fund wants to use this regime to operate on cross-border level – due to disclosures and transparency rules. The outcome may thus well be that many funds forego the passport, and remain active on a national level only. Such compliance costs also add to the return requirements that will be put on potential portfolio companies, in order to still have the same net return after the deduction of compliance costs.

For those few funds that do however qualify to fall under the AIFM directive, one should realize that the systemic risks that caused the recent financial crisis are on of the main drivers for the regulation, besides the typical protections against managerial opportunism to increase trust and protection among investors. Overly large positions, or overly risky positions due to remuneration and capital composition structures, had systemic consequences. Rules that limit this behavior or that increase the oversight on such activities, have however little use in the setting of venture capital funds, as those problems are not present in such funds. Compliance with such rules requires for instance transparency and disclosure of valuation methods, liquidity management, risk management, the use of leverage, remuneration, the potential for conflicts of interests, etc.⁶⁴⁶ Not all of these rules are thus relevant in a venture capital setting, as such funds do not necessarily cause systemic risks.⁶⁴⁷

Also in the United States have regulations been extended to include fund managers as well. The scope of the Investment Advisers Act of 1940 has been extended by Dodd-Frank. In fact, it is also a generalization to protect society from the systematic risks

⁶⁴⁴ Article 3(2) AIFMD

⁶⁴⁵ See Articles 26 to 29 of the AIFMD. SME's follow the meaning from that in Article 2(1) of the Annex to Commission Recommendation 2003/361/EC of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises.

⁶⁴⁶ Vermeulen and Pereira Dias Nunes (n 168).

⁶⁴⁷ European Commission, 'A New European Regime for Venture Capital, Public Consultation Document' (2011) <http://ec.europa.eu/internal_market/consultations/2011/venture_capital_en.htm> accessed 20 October 2012.

that alternative investment funds can bring⁶⁴⁸ – but while this is certainly true for hedge funds, it is a lot less true for venture capital funds.⁶⁴⁹ For that reason, venture capital funds are actually exempted.⁶⁵⁰ A venture capital also avoids the regulation of the Investment Company Act when there are less than 100 investors or if all investors are qualified purchasers (owning at least \$5 million in investments).⁶⁵¹

2.3. Unbundling the services: pledge funds, deal-per-deal fundraising, à-la-carte services, investor involvement

The attention has thus overwhelmingly focused on managing (aligning) the managers, but the fully delegated nature of the deal flow preparation, the investment selection, the investment management, and the capability offering towards investees has not adequately been discussed or questioned. The complementarity between investors and professional venture capitalists can also be matched by other means than just blind pools.

The services can however also be unbundled and be brought back to their roots. A higher degree of control for the investors and less delegation towards managers can be stipulated through the partnership agreement, if a partnership structure is used. All it requires, is deviating from today's standard terms. Investors can for instance maintain control over the participation on a deal-per-deal basis. Perhaps just like many business angel networks, investors can then pay a yearly fee for the screening and pre-selection. A per deal fee for due diligence, term sheet negotiations, drafting of investment documents and post-investment management (i.e. sitting on the board of companies) can then come on top of that. Such deal-per-deal fundraisings are also often called pledge funds if the joint commitments are still managed through a fund (i.e. organized as a partnership). It derives from the notion where individual investors "pledge" their affiliation to the Fund by indicating their intent to consider investing in individual deals.

Managers can also more act as account managers for investors, as is already done under the business model that is used in wealth management. Then, the legal organization will rather be that of a mandate rather than a partnership.

Such more individualized structures, that are less based on the standard market terms of venture capital funds, can already be found in co-investment and syndication deals. For instance when a corporate investors co-invests with a fund in a deal, but with an arrangement that the fund manager than also advises the follow up of the participation. Many institutional investors in venture capital funds already have bargained to obtain a

⁶⁴⁸ Viral V Acharya and Matthew Richardson, 'The Dodd-Frank Act, Systemic Risk and Capital Requirements' in Thorsten Beck (ed), *The Future of Banking* (Centre for Economic Policy Research 2011).

⁶⁴⁹ James Freeman, 'Is Silicon Valley a Systemic Risk?' [2009] *Wall Street Journal* <<http://online.wsj.com/news/articles/SB123923644886203393>> accessed 13 December 2012.

⁶⁵⁰ US Securities and Exchange Commission, 'SEC Adopts Dodd-Frank Act Amendments to Investment Advisers Act' <<http://www.sec.gov/news/press/2011/2011-133.htm>>.

⁶⁵¹ 15U.S.C§§80a-3(c)(1),80a-3(c)(7).

co-investment right through a separate account, for the deals that the fund manager picks to include into the fund.⁶⁵²

However, as much as contractual and partnership based arrangements may seem easy to realize, we have to realize that many countries have underdeveloped partnership laws. Many countries have defaulted to the corporate structure, even for venture capital investments where all parties can actually individually negotiate terms (instead of customizing a standard blueprint). Such corporate entity type offers particular problem for such deal-per-deal arrangements, unless a separate corporation is formed per portfolio investment. It is not possible to use the same corporation-based fund for multiple portfolio investment with varying participation choices from the end-investors. All participants will have different participations per portfolio company and returns can otherwise not be channeled, isolated or allocated per investor. The investors per portfolio company may vary after all.

Therefore, instead of letting the legal infrastructure dictate some market practices, it is better to suggest alternative structure that better maintains the link between the different portfolio companies with their specific end investors. Structures that thus offer more flexibility instead of limiting the users to the state-provided standard (motivated by situations where users cannot individually negotiate terms).

A concept that already reduces this difficulty is the umbrella fund concept where children funds can be spawned in a relatively inexpensive way. However, this facilitating role is rather on the securities regulations compliance level – each child fund still requires incorporation. And for situations that are not touched by many securities regulations, like pledge funds or venture capital funds that are not marketed to a large investor base, the role or impact of such regulations is minimal anyway.

Therefore I will mainly suggest the concept of protected cell companies. The protected cell company is a concept that was introduced in 1997 in Guernsey, and it was mainly intended to secure assets in a single legal entity, to prevent them from realization in case other assets or activities in the same entity would lead to insolvency and thus to liquidation.⁶⁵³ Such separation or segregation units in a single legal entity were called “cells”. Offshore centers like Gibraltar, Bermuda and the Cayman Islands copied the concept.⁶⁵⁴ It recently also started to be implemented in various onshore countries, like various states in the United States. In the European Union, Luxembourg and Malta also implemented this structure that was originally mainly used in captive insurance (to isolate risks per cell and to prevent that one type of accident could wipe out the entire fund that also had to cover other types of risks).⁶⁵⁵ Assets in one cell can be used only to meet liabilities in that cell. A protected cell-company can create in itself an unlimited number of bankruptcy-remote cells.

⁶⁵² Emma Dineen, ‘Changing Methods of Accessing Private Equity’ [2012] *Preqin Private Equity Spotlight*

<https://www.preqin.com/docs/newsletters/pe/Preqin_PESL_Jul_2012_Methods_of_PE_Investment.pdf> accessed 5 March 2013.

⁶⁵³ Nigel Feetham and Grant Jones, *Protected Cell Companies: A Guide to Their Implementation and Use* (Spiramus Press Ltd 2010).

⁶⁵⁴ Ibid.

⁶⁵⁵ Ibid.

Besides a use of protecting assets from insolvability, it is also possible to use such structure to link investment return stream from particular assets/securities in companies with particular shareholders of a cell. When shares are issued, it is possible to attribute them to a particular cell like a segregated portfolio. One does therefore not need to create a new corporation.

3. Conclusion

The theoretical chapter already described that standard setting can dramatically lower the transaction costs. It is a form of collective action that is in the interest of all individual transactions that follow next. However, if this standard-setting is done by the state, instead of a private agent or body, then the risk for over-inclusiveness became clear in this chapter. The corporate entity type, and its state-designed standard right bundles that come with equity, are sometimes too rigid. A demand for more freedom, and more attention to partnership like structures is often expressed. But in this chapter, I rather focused on how such standards like equity have also spread out to other domains – in this case tax law – and how this standardization in the legal infrastructure actually hinders private customized transactions. The same hindering for private customized transactions was illustrated in the setting of investors versus professional investment managers – and where investors would like to buy more unbundled services instead of merely buying a stake in a blind pool. The recommendations to the lawmaker should in both cases be to give a higher attention to more flexible legal structures.

Part 4: Searching & contracting for non-financial resources: coordinating to build conducive infrastructure for individual partnerings, and coordinating to overcome accumulation of individual partnering costs

This last part concentrates on transactions around complementary resources, other than capital. Accessing complementary resources externally may be a result of strategic choices or it may be a necessity. There is thus an interfirm partnering market for resources that are under the control of third parties.

Forming interfirm alliances is more costly than transacting around goods and complementary assets in anonymous and instant markets. For instance, if the counterparty is not part of the social network around a firm – potentially not even part of the extended social network via hired intermediaries, then there may be high search costs to find a suitable partner. Also, the exposure to external risks and counterparty risks (opportunism) and the impact of potential counterparty opportunism may be very substantial. There is a counterparty dependency that is not necessarily a result of the long-term duration of the relationship, but also of the level of transaction specific investments. The other party can even exploit the dependency that such transaction brings for the counterparty.

These hazards may be anticipated or mitigated upfront, through contracting and contract law. I will discuss this, and I will also illustrate how our legal infrastructure tried to cope with those costly and risky situations by adapting theories of contracting law (“incomplete contracting”). However, this attention often overlooked the role of trust, which may under some circumstances also have a self-enforcing role.⁶⁵⁶ I will therefore discuss the interaction between the effectiveness of trust and the attention to contract and contract law. The role of trust is at least as important as that of law (trust may be a less costly alternative to contracts⁶⁵⁷, or it may be a complement), and that role should not be destroyed.

Embedding transactions in a form of market infrastructure like an organized platform can even increase the effectiveness of trust, as reputational information may flow in a more transparent way and social sanctions may also be more effective than merely between direct parties. Such infrastructure may not only offer an increased effectiveness of the self-reinforcing property of trust, it may also lower search costs. However, creating such infrastructure may face some coordination or collective action problems – especially when no lead party can see a commercial opportunity to develop it and to offer incentives to let members join (which may for instance require an initial critical mass before the increasing returns may make the benefit higher than the cost). Governments may therefore potentially sponsor or create such infrastructure. Thus, instead of embarking on yet another scholarly discussion about contract law and lawmaking recommendations, I will rather tackle the question how governments can have an indirect role by trying to tackle this coordination or collective action problem to have conducive platforms. The legal infrastructure should thus not necessarily lose itself in fixing the costs of individual transactions by exclusively trying to deal with incomplete contracts or by continuing a trend towards increasingly complex contracts. The thesis of this part is then indeed that lawmakers and scholars should devote more

⁶⁵⁶ Ranjay Gulati, ‘Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances’ (1995) 38 *Academy of management journal* 85; Peter Smith Ring and Andrew H Van de Ven, ‘Structuring Cooperative Relationships between Organizations’ (1992) 13 *Strategic management journal* 483; Zaheer, McEvily and Perrone (n 48).

⁶⁵⁷ Laura Poppo and Todd Zenger, ‘Do Formal Contracts and Relational Governance Function as Substitutes or Complements?’ (2002) 23 *Strategic management journal* 707.

attention to overcoming coordination failures. Indirectly, market infrastructure like privately created platforms may also offer the infrastructure to reduce transaction costs between (potential) partners that use such mechanisms.

A second situation where coordination failures will be discussed, and where the market may create mechanisms to lower transaction costs, will be in the domain of licensing intellectual property. Technology-driven firms may need to source licenses from a large number of firms, and a high number of license transactions may be necessary. The previous parts did illustrate how state-designed corporate structures and entities served as a standard that could overcome transaction costs when negotiations with a large group are necessary. Here, I will also discuss a standardization effort to replace the individual negotiations (and its transaction costs that would otherwise be accumulated up to a prohibitively expensive point). Those standardization efforts are here in the intellectual property domain. This standardization comes however from the market instead of the state, namely through patent pools that group many individual contracts into one contract, and also other express forms of standard setting. But those market-driven mechanisms face some barriers or shortcomings in the legal infrastructure to fully function. An intellectual property holder may have a self-interest incentive not to grant a license to the pool, which is allowed, or only to grant it at disproportionate terms, which is allowed as well. An intellectual property may realize that his intellectual property becomes more valuable by not participating in the coordination mechanism or by behaving into competitive behavior once joined. When one wants to behave competitively and thereby only taking the benefits of the cooperation but not the costs, this is called free riding. Here it is the case with owners of complementary assets that have a monopoly and necessity position – and who may have a higher opportunity to free ride. The risk for holdup is substantial in such situations. Antitrust laws do not necessarily remedy this, and I will study how such patent pools can be better helped and supported in their useful market-driven function to reduce transaction costs for its members.

1. From contract law to conductive market infrastructure to foster partnerings

The type of interfirm transactions for technology-driven firms in the new industries is increasing for different reasons.⁶⁵⁸ One reason is a trend towards more specialized entities instead of one vertically integrated firm. This specialization may be for strategic reasons as accessing technology and know-how externally⁶⁵⁹ may lead to competitive advantage and a reduced level of uncertainty.⁶⁶⁰ Through learning, the knowledge can even be internalized in the meantime.⁶⁶¹ The telecom and semiconductor industries are

⁶⁵⁸ Raymond E Miles and Charles C Snow, 'Organizations: New Concepts for New Forms.' (1986) 28 California management review 62.

⁶⁵⁹ Joel Bleeker and David Ernst, 'The Way to Win in Cross-Border Alliances.' (1990) 69 Harvard business review 127.

⁶⁶⁰ Emanuela Todeva and David Knoke, 'Strategic Alliances and Models of Collaboration' (2005) 43 Management Decision 123.

⁶⁶¹ Coimbatore K Prahalad and Gary Hamel, 'The Core Competence of the Corporation' (1990) 68 Harvard business review 79; Gary Hamel, 'Competition for Competence and Interpartner

for instance industries that experienced a deconstruction of the value chain, with a landscape of multiple specialized firms now. Other firms may be in a situation that they have no other choice than to engage into interfirm transactions to access complementary resources. For innovative entrepreneurial firms, the reason to enter into interfirm partnerships or alliances will rather have to do with the constraints to exclusively control complementary resources, rather than a free strategic choice. These firms may have no other choice than to partner with other firms to use the necessary complementary resources. Financing and partnering to access complementary resources may come combined for such firms, through the activity of corporate venture capital. And for corporations, an equity investment can offer a form of a real option to a potentially complementary resource as well: once the uncertainties have been resolved, the larger corporation may choose to express an offer to acquire the entire firm.

Some interfirm interfaces may still resemble ones of an input-output logistics chain (i.e. in a deconstructed value chain), or may be of outsourcing nature of a lead firm that is more acting like a coordinator or instructor towards different partners and specialized providers.⁶⁶² The transactions can for instance be of a hierarchical nature like in outsourcing and subcontracting. For instance: research and development services to reduce innovation lead time or commercialization or marketing services for co-marketing in a new market where brand loyalty would take too long to establish, a distribution channel agreement to introduce technological innovations to the final market (often with downstream partners, such as large companies excelling at product commercialization), etc. But in many cases, the interactions will have a high knowledge related component, instead of being just an observable and commoditized product handoff between the firms. This already increases the search costs, as the necessary partner may not be part of the existing social network – and potentially not part of the networks that can be accessed through the intermediaries around a firm.

The knowledge element creates a specific exposure to moral hazards between partners. Not only is there the risk for learning and the counterparty's intention to gain capabilities (often an express goal of the partnering). It is also possible that firms may unintentionally lose their core proprietary knowledge to their partners. However, partners can also expressly behave opportunistically and purposely want to appropriate knowledge, but they may also otherwise choose to expose harmful competitive behavior instead of collaborative behavior. Such appropriation may deprive a company of a vital source of competitive advantage.⁶⁶³ But partner opportunism, and this ex-post incentive to undertake self-dealing, is in general a typical element that creates a (transaction) cost to anticipate. This also seriously increases the complexity of contracts, and it also requires ongoing monitoring (and consequent costs). This subpart will demonstrate how increasingly complex situations, which are difficult to fully foresee upfront, create more complex contracts and how contract law is

Learning within International Strategic Alliances' (1991) 12 Strategic Management Journal 83; Tarun Khanna, Ranjay Gulati and Nitin Nohria, 'The Dynamics of Learning Alliances: Competition, Cooperation, and Relative Scope' (1998) 19 Strategic management journal 193.

⁶⁶² Manuel Castells, 'The Culture of Real Virtuality: The Integration of Electronic Communication, the End of the Mass Audience, and the Rise of Interactive Networks', *The Rise of the Network Society* (Wiley-Blackwell 2009).

⁶⁶³ Massimo G Colombo, Luca Grilli and Evila Piva, 'In Search of Complementary Assets: The Determinants of Alliance Formation of High-Tech Start-Ups' (2006) 35 Research Policy 1166.

limited to cope with such situations. This part will also consider the role of trust to cope with such situations, before considering the role of market platforms/infrastructure to reinforce trust. The transparency that market infrastructure may conduct, allows learning about other's competencies and reliability.⁶⁶⁴ It also still has a search function and it increases the probability that partners will form more alliances with each other in the future. Market infrastructure can does supplement, complement and in some situations even replace functions that are otherwise provided through contract law.

All knowledge related collaborations have a risk for appropriation. But the opportunistic hazards that may lead to competitive behavior are even more generally present and more outspoken when competing entities enter into alliances. Even for them may coordination offer a better outcome than competition. Examples are co-development, joint research, joint marketing, joint production, joint distribution, joint commercialization, etc. These joined initiatives can pool together (complementary) resources. The source of the advantage of collaboration versus competition, may for instance be better economies of scale and saving on duplicate costs. Or it may simply prevent to erode profit in competitive price wars (in an extreme case, this may lead to cartels). Also here, appropriating knowledge will still be one of the opportunistic hazards – as there may be a high incentive to appropriate knowledge from a competitor.

Specific contractual anticipations will be discussed, and this heavily increases contract complexity, but social sanctions and trust will then be introduced as alternative or complementary tools. From one point of view, contract law also offers an extrinsic level of trust, by foreseeing sanctions – guaranteed by state-provided third party enforcement. However, despite their usefulness in situations that have easy handoffs, like products, in relationship driven transactions where the performance or the potential of opportunism can only become clear during the execution of the contract, those legal sanctions do sometimes not necessarily offer much added value to the social sanctions that already existed. They may even decrease intrinsic trustworthiness behavior, as partners will think that the counterparty will only use the legal sanctions for their behavioral expectations. The same may be true for the actual possibility to use social sanctions: despite there availability, the cost of using them down the line may be prohibitive due to opportunity costs (this knowledge can lead to a holdup by the other party). A contract and contract law are often unnecessary.⁶⁶⁵

Legal scholars and courts have realized that the sanctions in contract law may be too limited to foresee all possible situations that the future may bring, and that contract law (complimented by what parties can include – but even that is limited) is not adequate when there's an explosion of possible problems down the line. To prevent that contract law would not be effective, legal enforcement was extended to a broader set of situations even if they were not described upfront. This was done through the notion of Good Faith – or the legal obligation (and enforceable by legal sanctions) that one has to behave good even when a lack of formal inclusion of a situation in the contract or law would otherwise open an opportunity to behave opportunistically or to deliver poor

⁶⁶⁴ Ranjay Gulati and Martin Gargiulo, 'Where Do Interorganizational Networks Come from? 1' (1999) 104 *American journal of sociology* 1439.

⁶⁶⁵ Stewart Macaulay, 'Non-Contractual Relations in Business: A Preliminary Study' (1963) 28 *American sociological review* 55.

quality. However, I will discuss hereafter that this may be an idealized situation as this potential to go to court to obtain enforceable sanctions offers little real advantage in such situations – just like the social sanctions that would offer little help as well due to their opportunity costs. Thus, in case of partnering, the role of ex-ante reassurance of trustworthiness should not be underestimated.

Setting up the platform infrastructure that was just described, namely to enhance trust and to reduce search costs, may also be a joint collaborative activity. Then, such infrastructure becomes a mutual institution. But a social action problem may exist that may not allow to overcome this coordination costs. Even a commercial opportunity may be lacking (to launch such infrastructure on a commercial basis) due to the high minimum efficient scale before network effects will start to make it automatically attractive. Governments may step in to co-sponsor when such coordination failures exist.

1.1. Evolution of contract law

For legal scholars, contract law and privately drafted contracts are the main mechanism to manage the potential for opportunistic risks. Partnership law may supplement this and it may be of a mandatory or a default form. Together with the force of state-provided courts and state-provided enforcement means, a level of ex-ante trust may even be created.

There has been a substantial trend to more complex and detailed contracts. This will be discussed further. More complex contracts are to deal with all imaginable and foreseeable situations that a long-term relationship may undergo. However, the amount of situations that the lawmaker and the parties can foresee, are limited. And the implications of future situations or sources of problems that could not be foreseen, have been treated differently over different eras in contract theory. There has been a shift from the assumption that the content of a contract corresponds best to the will of the parties for every potential situation, to a tolerance that the contract and the law are potentially not entirely complete.

1.1.1. Classical – assumption of complete contracts

In the 19th century, the era of classical contract theory, formalism and an emphasis on presentation were important.⁶⁶⁶ Parties were supposed to regulate all aspects of the relationship. This assumes complete knowledge of the future and what will happen. There was the assumption that parties would include everything in the contract to protect their self-interest. That assumption thus also implied that what was in the contract was also all what the parties really wanted. The actual terms of the contract

⁶⁶⁶ Richard E Speidel, 'Afterword: The Shifting Domain of Contract' (1995) 90 *Northwestern University Law Review* 254.

had priority⁶⁶⁷, certainly over less formal will elements that one may assume besides that.

For long term contracts, we face however some problems under those strict assumptions: there is at least a lack of flexibility, as parties are simply incapable of foreseeing all possible future situations – and this makes dealing with unforeseeable situation very difficult. Classical contracting is more appropriate the more elements of the environment are predictable.⁶⁶⁸

1.1.2. Neoclassical: recognizing incomplete contracts

During the 20th century, the theory moved away from formalism, towards realism. It recognizes that not everything might be specified in the contract. Contracts may be incomplete.⁶⁶⁹ Terms may need to be implied from context.⁶⁷⁰ When a contractual situation is tested in court, then a test of reasonableness takes place for situations that emerged after the conclusion of the contract. This thus requires adaptive mechanisms to adapt to unanticipated disturbances.⁶⁷¹

Some contract parties had already realized their bounded rationality, and their limitations that cause them not to be able to include every future problem setting. This resulted in elaborated contracts with inclusions for a changing environment, for instance with trigger clauses that could trigger renegotiation or exits under certain conditions.⁶⁷² Otherwise, the contract may become too inflexible. Bounded rationality is the impossibility to foresee all future situations ex-ante.⁶⁷³ Besides mental limitations, uncertainty and complexity of the future states of the environment may also be a source of incompleteness.⁶⁷⁴ Besides that, still other sources of incompleteness in contracts may be vague or ambiguous wording or an unintended failure to comply with a contractual obligation.⁶⁷⁵

⁶⁶⁷ Thomas Wilhelmsson, 'Questions for a Critical Contract Law-and a Contradictory Answer: Contract as Social Cooperation', *Perspectives of Critical Contract Law* (Aldershot 1993).

⁶⁶⁸ Steven R Salbu, 'Joint Venture Contracts as Strategic Tools' (1991) 25 *Indiana Law Review* 397.

⁶⁶⁹ William W Bratton and Joseph A McCahery, 'Incomplete Contracts Theories of the Firm and Comparative Corporate Governance' (2001) 2 *Theoretical Inquiries in Law* 745.

⁶⁷⁰ Larry A DiMatteo, *Visions of Contract Theory: Rationality, Bargaining, and Interpretation* (Carolina Academic Press 2007).

⁶⁷¹ Wilhelmsson (n 667).

⁶⁷² J Harold Mulherin, 'Complexity in Long-Term Contracts: An Analysis of Natural Gas Contractual Provisions' (1986) 2 *Journal of Law, Economics and Organization* 105.

⁶⁷³ Herbert Alexander Simon, 'Theories of Bounded Rationality' (1972) 1 *Decision and organization* 161; Herbert Alexander Simon, *Models of Bounded Rationality: Empirically Grounded Economic Reason* (MIT press 1982); Williamson, *The Economic Institutions of Capitalism* (n 36).

⁶⁷⁴ Kyle J Mayer and Nicholas S Argyres, 'Learning to Contract: Evidence from the Personal Computer Industry' (2004) 15 *organization Science* 394.

⁶⁷⁵ Alan Schwartz, 'Relational Contracts in the Courts: An Analysis of Incomplete Agreements and Judicial Strategies' (1992) 21 *Journal of Legal Studies* 271; Jean Tirole, 'Incomplete Contracts: Where Do We Stand?' (1999) 67 *Econometrica* 741.

Incomplete contracts do however generate room for opportunism when not every situation is foreseen.⁶⁷⁶ Reducing the room for opportunism would increase the cost and level of details.⁶⁷⁷ Contracts for interfirm partnering are unavoidably incomplete.

1.1.3. *The concept of good faith*

To deal with incompleteness and unforeseeability of the future environment, a growing number of legal systems have used the notion of good faith, or a similar notion.⁶⁷⁸ The role of good faith has increased considerably. More and more legal systems adopt various versions of it. Good faith is expressed in a number of ways:

- A duty to cooperate
- A duty to provide information (especially for persons who have special knowledge or technical competence: an application the case of car sellers where there is an implied protection of the non-expert, although the non-expert also has his own duty to find information). Any event that may change the other party's execution should for instance be communicated.
- Keeping confidential information, or refraining from misusing it – i.e. through competing one on the basis of the information (which should otherwise normally require a confidentiality clause – it derives from fiduciary duties/ obligations).

Good faith can sometimes be found explicitly in legal statutes and codes. In Germany for instance, in section 157 BGB. In Italy, it is for instance expressed in articles 1362 to 1371 of the *Codice Civile*. In contrast to civil law, English law was long against the concept of good faith.⁶⁷⁹ English law is rather known to prefer predictability, while civil law privileges justice.⁶⁸⁰ Nonetheless, effectively it was equivalently applied, through equivalent notions (i.e. fairness and fair dealings, or equitable principles⁶⁸¹). US law is since the sixties however more open to it: article 1-304 of the American Uniform Commercial Code, and section 205 of the Restatement of Contracts Second immediately recognize and use it.

⁶⁷⁶ Victor P Goldberg, 'Regulation and Administered Contracts' (1976) 7 *The Bell Journal of Economics* 426; Mayer and Argyres (n 674); Yadong Luo, 'Are Joint Venture Partners More Opportunistic in a More Volatile Environment?' (2007) 28 *Strategic Management Journal* 39.

⁶⁷⁷ Marcos Fava Neves, 'Marketing and Network Contracts (agreements)' (2003) 3 *Journal on Chain and Network Science* 7.

⁶⁷⁸ Steven J Burton, 'Breach of Contract and the Common Law Duty to Perform in Good Faith' (1980) 94 *Harvard Law Review* 369; Robert S Summers, 'General Duty of Good Faith-Its Recognition and Conceptualization' (1981) 67 *Cornell Law Review* 810.

⁶⁷⁹ Anthony F Mason, 'Contract, Good Faith and Equitable Standards in Fair Dealing' (2000) 116 *Law Quarterly Review* 66.

⁶⁸⁰ Giuditta Cordero Moss, 'International Contracts between Common Law and Civil Law: Is Non-State Law to Be Preferred? The Difficulty of Interpreting Legal Standards Such as Good Faith' (2007) 7 *Global Jurist* 14.

⁶⁸¹ Reziya Harrison, *Good Faith in Sales* (Sweet & Maxwell 1997).

1.2. Increasing contract complexity

Despite the help of notions like good faith and incompleteness, contract complexity increases substantially when a formal contract is used in a long-term situation. The exposure to opportunistic hazards (especially the potential to expropriate knowledge) or the potential for holdups (following from time-bounded dependency and asset specificity⁶⁸²) will substantially increase the complexity of such contracts compared to other and simpler market transactions. This complexity includes mechanisms to prevent self-dealing, as well as ongoing governance mechanisms, or ongoing monitoring mechanisms. Also the knowledge intensive element will require provisions regarding intellectual property usage and protection, and ownership of new intellectual property rights (if any).

Such contracts will start to include a number of noncomplex and banal elements, like the type of tasks that a party should perform (and if contractors or consultants may be employed), and potentially the type of remuneration. The latter may not be needed under a symmetric cooperative setting, but in such joint setting there may be a need to agree on the contributions or cost sharing. But this amount of sharing depends on the magnitude of the joint activity and on deciding what should still remain in the hands of individual partners (i.e. manufacturing, marketing and/or sales, etc.). It may also require setting boundaries of how the results of the joint effort may be used outside the collaboration (thus in a setting where both parties may potentially be competitors).

1.2.1. Intellectual property aspects of a cooperation

Licensing or other intellectual property terms are often included in the partnering arrangements, or may be the very subject of the arrangement itself. To be able to use the technology, a license may also be accompanied by a transfer of know-how to build capabilities at the counterparty to actually allow him to use the technology (after learning). This is time consuming and costly because it is usually accomplished through the training of personnel, trips by the engineers of the licensor and other services.⁶⁸³

But increased contract complexity is often the result of other reasons. For instance, in contrast to the transfer of ownership over physical goods, licenses are often used to allow a continuous control on the counterparty. The intellectual property provider may be in a monopoly position, as the sole provider of the complementary asset (the technology) and this bargaining power may allow to include of some restrictive terms. The dependency on this unique intellectual property thus creates a form of lock in that can be exploited to demand additional rights (control, etc.). A license would for instance typically include a field of use limitation, but this can be tailored in a very detailed way.

⁶⁸² Jeffrey J Reuer and Africa Ariño, 'Contractual Renegotiations in Strategic Alliances' (2002) 28 *Journal of Management* 47.

⁶⁸³ David J Teece, 'Technology Transfer by Multinational Firms: The Resource Cost of Transferring Technological Know-How', *Essays in Technology Management and Policy: Selected Papers of David J. Teece* (World Scientific 2003); Farok J Contractor, *International Technology Licensing: Compensation, Costs, and Negotiation* (Lexington Books 1981).

The cooperation itself may also result in the production of new intellectual property, and this may then require an arrangement for the allocation of the new intellectual property. This may be to one of the parties, to both (co-ownership) or to a joint entity. It can include an appropriate form of license back to the party that contributed.⁶⁸⁴ Yet to be developed intellectual property, in the course of the cooperation, is generally called foreground intellectual property.⁶⁸⁵

A particular aspect of the arrangement is however also how existing intellectual property will be used. Existing intellectual property that parties already have before starting the cooperation is often called background intellectual property.

Newly developed intellectual property can however be an improvement of the existing intellectual property. If ownership would then be allocated across different parties, then this may create coordination problems for every party that wants to use such intellectual property in the future.

In case of an R&D service provider, the R&D service provider will prefer to keep the foreground intellectual property with him (through allocation or a license) as this allows continuing services towards other clients on the basis of that technology that will then become background intellectual property (in combination with already available background intellectual property). Possibly, client-specific intellectual property can still be allocated to the client.⁶⁸⁶

Also in case of universities, such matter of existing and new intellectual property is a sensitive subject. It can be controversial to attribute full intellectual property (or an exclusive license) to the sponsor, especially as it sometimes happens and happened in these cases that the sponsor only had to pay marginal instead of full costs of the development (thereby partly benefiting from the subsidized nature of a university, a situation that is not present in other types of research service providers). It also happens that the sponsor will become the owner of the intellectual property, but that normally only happens when the sponsor made a substantial investment, or when knowledge and material has been offered to the university for the development. Additional funding from 3rd parties can thus play a role.

In fact, for the last aspect, the sponsor and the research institution have more or less these choices to allocate the ownership of the intellectual property between the two of them:⁶⁸⁷

- The sponsor becomes the owner
- The research institution becomes the owner (and the sponsor receives a license)
- The sponsor and the research institution are co-owner
- A jointly owned spin off will be created that will be the owner

⁶⁸⁴ Joseph Yang, 'What Corporate Counsel Should Know About IP Planning for Technology-Driven Alliances (Part 2)' (2005) 50 *The Practical Lawyer* 31.

⁶⁸⁵ Marcel Bogers, 'The Open Innovation Paradox: Knowledge Sharing and Protection in R&D Collaborations' (2011) 14 *European Journal of Innovation Management* 93.

⁶⁸⁶ Coolsaet (n 107).

⁶⁸⁷ *Ibid.*

- The sponsor becomes the owner, but if valorization doesn't (sufficiently) take place in a specific timeframe, then the research becomes the owner
- The research institution becomes the owner, but if valorization doesn't (sufficiently) take place in a specific timeframe, then the sponsor becomes the owner
- Initially, the sponsor becomes the owner, but the final decision will be postponed until the end of the project, through an audit procedure
- Initially, the research institution becomes the owner, but the final decision will be postponed until the end of the project, through an audit procedure
- The final decision will be postponed until the project will be finalized, or a period of a few months to assess the commercial potential to come to an ownership and royalty remuneration decision may be acceptable.

Most universities in Europe choose for a transfer to the contract sponsor, or they act as a co-owner, as it would be too costly to patent it as a research institution.⁶⁸⁸ The situation in the United States is different. And to solve the high cost problem for patenting, most US universities require a research sponsor to cover the costs for obtaining the patent protection, which will consequently allow them to obtain a license. Of course, sponsors then consequently often demand an exclusive license. Licenses are often limited to the use within one particular domain.

1.2.2. *Ex-ante licensing term transparency, and standard licenses*

To reduce transaction costs to obtain individual licenses, including the substantial time investments just to agree on terms, the upfront publication of license terms may heavily reduce this cost. The essence is upfront certainty, and to come to market conform licensing fees (i.e. Fair, Reasonable and Non Discriminatory licenses).⁶⁸⁹

Closely related to ex-ante transparency on licensing, should be the distribution of standard license designs. Or making some license and license blueprints transparent so that later use by third parties can happen in a cost effective way, through a substantial saving on contract drafting. An example is the "cre-lox" agreement from 1998 between DuPont and the US National Institutes of Health.⁶⁹⁰ This agreement serves more or less as a standard for Material Transfer Agreements between sponsors and researching parties. However, between universities, in case of biotechnological R&D, the Uniform Biological Material Transfer Agreement acts more or less as a standard.⁶⁹¹

Such standards, or the transparency on already used terms, can also give guidelines on drafting or negotiation practices that were otherwise ad-hoc – with little information

⁶⁸⁸ Ibid.

⁶⁸⁹ Annette Kur, Max Planck and Thomas Dreier, *European Intellectual Property Law: Text, Cases and Materials* (Edward Elgar Publishing 2013); Suzanne Michael, *Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* (DIANE Publishing 2011).

⁶⁹⁰ John H Barton and Joseph Strauss, 'How Can the Developing World Protect Itself from Biotech Patent-Holders?' (2000) 406 *Nature* 455.

⁶⁹¹ Zhen Lei, Rakhi Juneja and Brian D Wright, 'Patents versus Patenting: Implications of Intellectual Property Protection for Biological Research' (2009) 27 *Nature Biotechnology* 36.

how other market users tackled similar issues. This is and was for instance the case with valuation. Intellectual property is often valued on the basis of its development costs, or the reproduction costs.⁶⁹² However, in most cases, there is no link with future economic potential with such valuation. However, the decision of a licensee will largely depend on the price, and on the availability of substitutes (i.e. circumventions). The arbitration board of the German Patent and Trademark Office publishes for instance licensing rates for all kinds of inventions, based on the International Patent Classification (IPC). The licensing rates in this documentation are recommendations based on historical licensing rates and converge to market standards. The main objective is to support negotiating parties to find a licensing rate for their licensing contracts. Similarly, online transaction databases emerge. An example of online databases is RoyaltySource⁶⁹³, which provides actors with information to support their valuation of intellectual property rights.

Some movements however aim for free licenses, besides the publication of (widely used) license templates: free and open source license movements in software for instance. The Creative Commons Project⁶⁹⁴ aims to promote norms of access to contents with less limitation by promoting standardized licensing terms. Standard licenses are a part of the promotion of the philosophy of knowledge distribution (namely the open distribution philosophy).

1.2.3. *Opportunistic hazard controls & continuously governed contracts*

There are many more alliance types between firms, than just licensing alliances. And for those other types, standard contracts will rarely be available, and the parties will rather have to add the complexity to manage risks themselves. The rate of failure of alliances is however remarkably high. Empirical research indicates that more than half of strategic alliances fail.⁶⁹⁵ Despite the willingness to add a level of risk control by the parties, there may be many reasons, like non-controllable external risks and uncertainties. And besides that, it is also not purely a matter of anticipating opportunistic hazards as the partner selection should also take care of non-legal elements – the partner's need to have some symmetric properties (i.e. managerial style) that should allow to cooperate for some time.⁶⁹⁶

Policing the risk for opportunism and poor performance happens mainly through a large number of contractual provisions that prevent the self-dealing of partners. The

⁶⁹² Federico Munari and Raffaele Oriani, *The Economic Valuation of Patents: Methods and Applications* (Edward Elgar Publishing 2011); William J Murphy, John L Orcutt and Paul C Remus, *Patent Valuation: Improving Decision Making Through Analysis* (John Wiley & Sons 2012).

⁶⁹³ <http://www.royaltysource.com>

⁶⁹⁴ <http://creativecommons.org>

⁶⁹⁵ Kathryn Rudie Harrigan, 'Joint Ventures and Competitive Strategy' (1988) 9 *Strategic management journal* 141; Bruce Kogut, 'Joint Ventures: Theoretical and Empirical Perspectives' (1988) 9 *Strategic management journal* 319; M Tina Dacin, Michael A Hitt and Edward Levitas, 'Selecting Partners for Successful International Alliances: Examination of US and Korean Firms' (1997) 32 *Journal of world business* 3.

⁶⁹⁶ Keith D Brouthers, Lance Eliot Brouthers and Timothy J Wilkinson, 'Strategic Alliances: Choose Your Partners' (1995) 28 *Long range planning* 2.

long term nature of the cooperation, and the unforeseen circumstances that will cross the road, may also require to obtain on-going governance mechanisms like the establishment of committees, co-decision rights for some decisions, inclusion of deadlock resolution mechanisms, exit mechanisms, etc. They serve to “make decisions about the issues that cannot be contractually specified”.⁶⁹⁷ An incomplete but evolving and continuously governed contract may be better than a complete yet static contract.

Anticipating the risk for such hazards does not always result in contractual provisions. It may also lead to some transactions simply not taking place. For instance, firms will only license as long as the licensing revenues are bigger than the inherent risk of creating competitors. Given the knowledge element, there is indeed the risk for appropriation of know-how. Especially small firms are more exposed to this in relations with large firms who have more learning power. Once the know-how is transferred, the buyer may act self-interested and may try to avoid paying for it, since it would be difficult to force to unlearn what has been taught.

Another source of opportunism and situation that needs on-going governance is a result of the strong level of dependency on the counterparty (and the high cost of accessing alternatives, once the arrangement has started): this lock-in can create an incentive to exploit the holdup situation. Such lock-in can be the result of specific costs and investments that were made to execute the arrangement – for instance the investment in specific assets. Also, the need to use complementary third party intellectual property may represent an asset specific investment, with consequent holdup potential. The usage of particular contractual provisions is therefore also a function of asset specificity as well as the duration of the partnering.⁶⁹⁸ Not everything method to prevent opportunism depends however on contract design. If both parties can make the other party hostage, then this can also enhance cooperation.⁶⁹⁹ Also a ‘shadow of the future’ can prevent opportunism.⁷⁰⁰

Asset specific investments at the level of one party may lead to a request for a long term contract towards the other party, to protect against holdup or a too strong bargaining position for follow-up contracts. Williamson suggested unified governance as the most optimal way of governance in such situations: paying a control premium can solve holdup.⁷⁰¹ Self-dealing can be prevented if the existence of a counterparty is thus excluded and if all agents involved can be controlled by instructions.

⁶⁹⁷ Josh Lerner and Robert P Merges, ‘The Control of Technology Alliances: An Empirical Analysis of the Biotechnology Industry’ (1998) 46 *The Journal of Industrial Economics* 125.

⁶⁹⁸ Jeffrey J Reuer and Africa Ariño, ‘Strategic Alliance Contracts: Dimensions and Determinants of Contractual Complexity’ (2007) 28 *Strategic Management Journal* 313.

⁶⁹⁹ Oliver E Williamson, ‘Credible Commitments: Using Hostages to Support Exchange’ <<http://classwebs.spea.indiana.edu/kenricha/Classes/V640/V640%20Readings/Credible%20Commitments%20Williamson.pdf>> accessed 1 March 2014.

⁷⁰⁰ Robert M Axelrod, *The Evolution of Cooperation* (Basic books 2006).

⁷⁰¹ Oliver E Williamson, *The Mechanisms of Governance* (Oxford University Press 1996); Joanne E Oxley, ‘Appropriability Hazards and Governance in Strategic Alliances: A Transaction Cost Approach’ (1997) 13 *Journal of Law, Economics, and Organization* 387.

In situations where remuneration is involved, this can be made performance-based in order to align interests. Licensing and research and development services are often remunerated with royalties or revenue-based models that thus ultimately depends on the commercial success. Such performance-based remuneration can also be through dividends from shares. Likewise, a joint venture, and the distribution that comes with the equity allocation, can also offer a level of alignment – in that case the alignment may not come from the performance based remuneration but rather from the equal allocation of risks and rewards that will prevent a party from taking advantage of the other party.⁷⁰²

1.2.4. Monitoring design

Part of the prevention of opportunistic hazards and the ongoing governance mechanism, will be continuous monitoring of the counterparty. This will then require specific inclusions in the arrangement of information rights, to reduce the information asymmetry. These can for instance be written reports, the right to undertake audits, etc.⁷⁰³ The use of equity to structure the collaboration may offer state-provided monitoring rights.⁷⁰⁴ Especially when information is difficult to codify, equity is more likely.⁷⁰⁵

1.3. Contract law limitations force a focus switch to trust networks, communities and infrastructure

All of the above aspects can be discussed in more detail. But the point to be made is the increasing level of contract complexity that parties have to cope with. Only in some type of alliances, like in some homogenous license arrangements, are standard blueprints available. But in many heterogeneous situations, contracts absorb a high level of energy to stipulate the party's obligations and contributions, but also to cope with counterparty risks. Contract law is thus limited to govern such long-term relational risks like external uncertainties, exposure to opportunistic hazards and risks for poor performance. This is even true under the recognition of notions like incomplete contracts and notions of good faith that can fill up the gaps in the contracts. A problem of neoclassical contract law is that it still mainly focuses on nonperformance. For instance, circumstances are defined where a party may be excused from their obligations. But this can lead to deadlock situations. For instance by excusing a non-

⁷⁰² David J Teece, 'Competition, Cooperation, and Innovation: Organizational Arrangements for Regimes of Rapid Technological Progress' (1992) 18 *Journal of Economic Behavior & Organization* 1.

⁷⁰³ Arvind Parkhe, 'Strategic Alliance Structuring: A Game Theoretic and Transaction Cost Examination of Interfirm Cooperation' (1993) 36 *Academy of management journal* 794.

⁷⁰⁴ Kogut (n 695); Jean-Francois Hennart, 'A Transaction Costs Theory of Equity Joint Ventures' (1988) 9 *Strategic Management Journal* 361; Gary P Pisano, 'Using Equity Participation to Support Exchange: Evidence from the Biotechnology Industry' (1989) 5 *Journal of Law, Economics & Organization* 109.

⁷⁰⁵ Bharat N Anand and Tarun Khanna, 'Do Firms Learn to Create Value? The Case of Alliances' (2000) 21 *Strategic management journal* 295.

performing party if the other party caused the disability to perform. However, things like how to escape from holdup problems, and how to resolve deadlocks, are not a well-developed direction.⁷⁰⁶

Contracts do however not stand alone and are part of a relational web. Extralegal trust may often be a bigger factor to enter into such long-term arrangements; instead of ex-ante threats that are created by contract and that are enforceable by the force of contract law (thereby thus creating extrinsic trust as well). For instance, past cooperations with a partner can be a source of trustworthiness for further cooperations.⁷⁰⁷ Trust can also exist indirectly, through embeddedness in a social network where reputational information and referral information can freely flow. Previously unconnected firms are more likely to ally if both were tied to a common third-party.⁷⁰⁸

Very few suggestions for an updated contract law exists (i.e. Ian Macneil's concept of relations contracts⁷⁰⁹), and efforts should actually better be directed to fostering conducive infrastructure where such indirect trust can flow. The thesis of this chapter is thus that governments may better invest energy in indirectly supporting private market infrastructure, instead of further optimizing a difficult to optimize domain like contract law – given its generic nature.

1.3.1. The role of trust

The embeddedness of a transaction in a social setting where trust and transparency information can flow can replace or supplement the role of contracts.⁷¹⁰ Also, the increased effectiveness of social sanctions (and their cost) may offer a better extrinsic mechanism to force trustworthiness than the extrinsic threat that contract law and courts can offer. The importance of ex-ante effects of sanctions can be explained, as long-term relationships may have a prohibitively costly recovery – even if ex-post social and legal sanctions may offer alternative recovery possibilities.

Intrinsic trust may also exist. The use of a contract has some effects on intrinsic trust. Detailed negotiated contracts may actually signal a lack of trust in the other party.⁷¹¹ As a reaction, that other party may limit its behavior to that what it strictly demanded from him⁷¹², and the first party may be treated in a more hostile way due to that as well (the party may be considered as potentially untrustworthy – on its turn requiring

⁷⁰⁶ Ph John Kozyris, 'Equal Joint-Venture Corporations in France: Problems of Control and Resolution of Deadlocks' (1969) 17 *The American Journal of Comparative Law* 503.

⁷⁰⁷ Ranjay Gulati, 'Social Structure and Alliance Formation Patterns: A Longitudinal Analysis' (1995) 40 *Administrative science quarterly* 619.

⁷⁰⁸ *Ibid.*

⁷⁰⁹ Ian MacNeil, 'Contracts: Adjustment of Long-Term Economic Relations under Classical, Neoclassical, and Relational Contract Law' (1977) 72 *Northwestern University Law Review* 854.

⁷¹⁰ Mayer and Argyres (n 674).

⁷¹¹ Macaulay (n 665).

⁷¹² *Ibid.*

extrinsic reassurance through contracting).⁷¹³ Contracts may signal distrust and even encourage the opportunistic behavior they are designed to discourage.⁷¹⁴

For some authors, trust and contracts can therefore be both substitutes and complements.⁷¹⁵ These can either reinforce the intrinsic trust, but they can also destroy it. Even empirical evidence is inconclusive whether these are substitutes and/or complements.⁷¹⁶ However, differentiating between extrinsic and intrinsic trust may be necessary. The paragraph above illustrated how extrinsic sources of trust (like contracts) can destroy intrinsic sources of trust. But besides such a destroying role, different sources of extrinsic trust may actually have a reinforcing or complementing role: the availability of extrinsic trust from potential social sanctions may make parties actually comfortable with only having incomplete contracts (notions like good faith also have a supplementing role then, although a legal one).⁷¹⁷

1.3.2. Overcoming the weaknesses of trust and social sanctions: platforms

Embedding the relationship in a trust network or trust community may thus lower the contracting cost. Reputation may then complement or even substitute inter-party legal sanctioning power. Even when there are no expectations to undertake repeated transactions, this spread of reputational information can align the interests of potential alliance partners. This is a normalizing force against opportunistic hazards and hold up problems. The shadow of the future is suddenly not limited anymore to single parties or a region, but a whole industry can learn about wrongdoings.

Such communities and networks also have a function to reduce search costs. Some network actors like venture capitalists and lawyers may already offer such search and reputational trust function, by occasionally (ad-hoc) connecting agents in their network and by extending their own reputation to such agents.

Such business networks or communities can exist and emerge organically, but they can also emerge thanks to an infrastructure that hosts them. Incubators can be given as examples of such infrastructures.⁷¹⁸ But also associations have often played a central role to link parties and to create the necessarily level of trust to cooperate among individual members. Business associations also played a key role in Silicon Valley's industrial system:⁷¹⁹

⁷¹³ Mayer and Argyres (n 674).

⁷¹⁴ Sumantra Ghoshal and Peter Moran, 'Bad for Practice: A Critique of the Transaction Cost Theory' (1996) 21 *Academy of management Review* 13; Poppo and Zenger (n 657).

⁷¹⁵ Rosalinde Klein Woolthuis, Bas Hillebrand and Bart Nooteboom, 'Trust, Contract and Relationship Development' (2005) 26 *Organization Studies* 813.

⁷¹⁶ Mayer and Argyres (n 674).

⁷¹⁷ Poppo and Zenger (n 657).

⁷¹⁸ Joel AC Baum, Tony Calabrese and Brian S Silverman, 'Don't Go It Alone: Alliance Network Composition and Startups' Performance in Canadian Biotechnology' (2000) 21 *Strategic Management Journal* 267.

⁷¹⁹ AnnaLee Saxenian, 'Lessons from Silicon Valley' (1994) 97 *Technology Review* 42.

- Santa Clara County Manufacturing Group worked with government to solve problems
- The western electronics manufacturers association fostered collaboration among small and medium sized firms
- Semiconductor Equipment and Materials Institute formulated technical standards for semiconductor wafers

Such infrastructure may thus indeed also be with the express goal to bring parties together to collaborate. This may for instance be a platform to bring licensors and licensees of intellectual property together and to offer increased reputational transparency. The heterogeneous nature of partnering propositions (for intellectual property licenses, this may still be relatively homogenous) may however always create a barrier to lead to a full development of such partnering market: such infrastructure is thus not a silver bullet that will take away all sources of market incompleteness. However, if such infrastructure can additionally also standardize offerings among its members (i.e. standard licenses), then contracting costs between them may also be further reduced in such infrastructure. Eventually, even joint insurance mechanisms (i.e. a central counterparty) may increase the trust and the transaction rate even more – as dependency on counterparty hazards can then be minimized. However, fully anonymous transactions are not always possible in a partnering setting where knowledge is a substantial element of the interface between parties: technical assistance may be necessary and this limits the commoditization of the interface or handover. Partnerings will require ongoing participation.

1.3.3. A role for governments: sponsoring & fostering trust infrastructure

Such communities may also create rulebooks, besides merely relying on social sanctions like boycott. This poses a question for the legal acceptance of such form of legal pluralism. But the most pressing element is to foster such communities.⁷²⁰ After all, forming such platforms or communities often represents a coordination problem and private parties may lack the incentive to take a lead role to start with a small set of users that can then grow. A legal framework can offer the means to overcome such coordination failures to start a community or platform. But governments may also act as a direct actor in the market by providing such social welfare enhancing platforms itself (such infrastructure has a public good nature), or by sponsor them. The basic rationale for government involvement is that the costs of setting up and running a network (finding the right partners, negotiating, creating behavioral rules for co-operation and building the necessary shared resources) may exceed the private benefits from network formation, due to network externalities that encourage free riding. Also, when firms cannot access complementary assets due to transaction costs, then society is missing out on welfare surpluses. Governments do thus have a case to sponsor or foster such infrastructure, which has a complementing or substituting role for contract law (the latter reaches its limits).

⁷²⁰ Maarten Bavinck and others, 'From Indifference to Mutual Support – A Comparative Analysis of Legal Pluralism in the Governing of South Asian Fisheries' (2013) 25 *European Journal of Development Research* 621.

Creating the infrastructure that can host organized trust networks and communities is thus recognized by potential coordination failures. While governments may provide or co-sponsor directly the creation of such infrastructure through policymaking (as described in the next title), their private creation may thus also be fostered through lawmaking.

The current legal infrastructure does not sufficiently foster the private emergence of such infrastructure. The existence of foundation and association structures, as well as mutual entity types does not solve the collective action problem or the transaction cost to actually join or start one, but it supports their existence once they emerge. In contrast to commercially driven platforms, mutual platforms have the characteristic that the members (users) are also the co-owners. While traditional corporations or partnerships can be used, many countries also offer associations or a specific legal entity to combine two capacities: namely the cooperation. This is an entity type that was mainly conceived to accommodate the needs of self-sustaining communities. The earliest ones were created in Europe and North America during the 17th and 18th centuries. In the 19th century there would be a spread of the cooperative movement throughout many countries.⁷²¹ Early legal recognitions would for instance be the Industrial and Provident Societies Act in 1862 in the UK that gave also binding legal authority for their rules.⁷²² Lawmakers have however often struggled with the fact that such entity types combine aspects of commercial corporations, companies or partnerships, with aspects of associations.⁷²³ But these struggles are less relevant for the envisioned purpose, and I do not discuss them in this study.

However, actually starting and creating trust infrastructure by private initiative is more troublesome. It can be plagued by holdup problems when necessary parties would not want to join, or by free riders that hope to access the benefits of the infrastructure without bearing the participation cost. These problems are insufficiently tackled in organizational law, and no amount of lawmaking may overcome this. The value for individual members depends on the number of other members that join the community. A critical mass may need to be obtained before the community can sustain and grow through an upward spiral. This is however a problem that cannot easily be overcome, certainly not via lawmaking, and it can discourage private members from creating such infrastructure, even if convenient legal infrastructure would be present. Policymaking may then step in and provide or (co-)sponsor such infrastructure directly.

1.3.4. Case: triple helix public-private cooperation in Eindhoven and beyond

⁷²¹ Kimberly Zeuli and Robert Cropp, *Cooperatives: Principles and Practices in the 21st Century* (University of Wisconsin Center for Cooperatives 2004) 21.

⁷²² Arthur Scratchley, *The Law of Land Societies, and Co-Operative Farming and Land Societies* (Shaw & Sons 1881).

⁷²³ Fabio R Chaddad and Michael L Cook, 'Understanding New Cooperative Models: An Ownership–Control Rights Typology' (2004) 26 *Applied Economic Perspectives and Policy* 348; Fabio R Chaddad and Michael L Cook, 'Redesigning Cooperative Boundaries: The Emergence of New Models' (2004) 86 *American Journal of Agricultural Economics* 1249.

An example where the government facilitates interfirm collaboration through creating or supporting organized industry communities or host infrastructure for such communities, is the so-called triple helix model.⁷²⁴ The triple helix model is a collaboration between universities, industry and the government. Those actors are then encouraged to have interfaces to collaborate (industrial liaison offices, technology transfer offices, contract offices, etc.).⁷²⁵ An example of such a successful triple helix collaboration is Brainport in the Netherlands, with a technical university (from Eindhoven), industry actors like electronics giant Philips and with the local Dutch government actors.⁷²⁶ The Brainport initiative hosts a number of industry-specific sub-initiatives like DSP valley (for the Digital Signaling Processing industry, and stretching between Eindhoven, Leuven and Aachen) that also actively help in brokerage and matchmaking with the member firms in the region.⁷²⁷ As a result of this successful public-private cooperation, the region has become one of Europe's top-3 regions in patent density. The region has attracted the bulk of the corporate R&D activity in The Netherlands, and close to 400 000 knowledge workers are active in the region now.⁷²⁸

2. Overcoming transaction cost accumulation to access complementary resources by creating aggregation and standardization infrastructure

Today's trend in industrial organization points in the direction of economies of specialization. A higher need for interfirm alliances to access complementary resources is then a natural evolution. Sometimes, the number of complementary resources that need to be accessed externally can be so high, that the accumulation of the individual transaction costs to obtain them becomes prohibitively high. Private mechanisms may offer an outcome to lower those individual transaction costs. For instance, by creating standards to reduce the transaction cost between individual firms. Or, by crystalizing costs of all individual transactions between individual firms into one single transaction. But the latter mechanism even faces difficulties to overcome the bargaining power of exclusive holders of unique complementary assets: those resource holders' interest may still rather be to offer costly individually negotiated transactions instead of joining a cost-reduction mechanism. This creates a holdup problem. Their bargaining power can even increase once a transaction cost-reduction mechanism arises in parallel, as they may free ride on the benefits without paying the consequences of joining the mechanism. Such potential for holdup and free riding of exclusive holders of unique complementary assets is particularly present in the domain of intellectual property.

⁷²⁴ McCahery and Vermeulen, 'Triple Helix Strategies in High Tech Clusters' (n 164).

⁷²⁵ Loet Leydesdorff and Henry Etzkowitz, 'The Triple Helix as a Model for Innovation Studies' (1998) 25 *Science and Public Policy* 195.

⁷²⁶ Joseph A McCahery, Erik PM Vermeulen and Andrew M Banks, 'Corporate Venture Capital: From Venturing to Partnering' in Douglas Cumming (ed), *The Oxford Handbook of Venture Capital* (Oxford University Press 2012).

⁷²⁷ Brainport Development, *What's Next? Brainport Eindhoven Region Aligning Smart and Strong* (Brainport Development 2011).

⁷²⁸ Stichting Brainport, *Brainport Eindhoven: Economisch Success Dankzij Samenwerking* (Stichting Brainport 2011).

Obtaining individual licenses for the use of intellectual property under today's circumstances incurs high transaction costs. The intellectual property systems consist out of a balance between spreading technological knowledge versus allowing monopolizing it. There's a constant movement between those two extremes. Originally, innovations enjoyed complete information freedom (as public good), but few innovators were motivated to invest energy in developing something when imitators could not be excluded. The introduction of intellectual property rights with its exclusion rights then did the pendulum swing towards monopolization. The concept of intellectual property rights tries to overcome the underproduction of knowledge that would otherwise be a public good and that would therefore lack the possibility to exclude others.⁷²⁹ Monopolization of knowledge, and excluding other then offers an incentive to produce such knowledge that indirectly also offers a societal surplus. As a compromise, the public disclosure function of the patent system facilitates the diffusion of new knowledge (although imitation during the patent duration is forbidden) and potentially reduces the amount of duplicative R&D that would otherwise be wasteful from a societal point of view. The same energy can then be directed towards producing really new knowledge. Recently, the monopoly component has been weakened slightly through the application of antitrust law. A concept by which a temporary monopoly is granted to right holders causes market failure by its very nature, as rent-seeking and bargaining power may lead to holdup situations (i.e. refusing to license to specific counterparties).⁷³⁰ The artificial monopoly right that was created to solve the underproduction problem also had the danger of significantly preventing the spread of the knowledge that would be created under such monopoly regime. Some pressure groups advocate however still more weakening towards more public good properties. Others suggest strengthening patent rights, for example by lengthening their term to incentive R&D and knowledge production even more.⁷³¹ This is a lengthy and animated discussion that falls outside the scope of this study.

The current design –and the exclusion rights in particular– allow that patent holders may choose not to offer licenses. Blocking competitors is possible but may not be ideal from a long-term or societal perspective: the patent system fails its original purpose if it does not bring useable knowledge and products to the market.⁷³² This situation may however be problematic under today's trends where many individual licenses over many small elements may be needed. Also when patent holders may be willing to be in the market, many individual licenses for such small elements increases the chance that some individual patent holders can exploit a holdup situation. The situation of patenting many small incremental innovations, or small modules, often with only a

⁷²⁹ Kenneth Arrow, 'Economic Welfare and the Allocation of Resources for Invention', *The rate and direction of inventive activity: Economic and social factors* (National Bureau of Economic Research 1962) <<http://www.nber.org/chapters/c2144.pdf>> accessed 29 May 2014.

⁷³⁰ Bruce H Kobayashi and Joshua D Wright, 'Intellectual Property and Standard Setting', *Handbook on the Antitrust Aspects of Standards Setting* (American Bar Association 2010).

⁷³¹ F Scott Kieff, 'Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules, The' (2003) 45 Boston College Law Review 55.

⁷³² Henry Chesbrough, 'Orchestrating Appropriability: Towards an Endogenous View of Capturing Value from Innovation Investments', *The Handbook of Technology and Innovation Management* (Wiley-Blackwell 2008).

small inventive step in each of them, leads to a patent thicket.⁷³³ A patent thicket can lead to a license stacking situation – negotiating many different licenses can be prohibitively costly as the different components may be patented by different agents. Improvements are often created and patented by companies that are external to the initial innovator. In case a third party creates the patentable improvement, this can again be a source of a blocking patent.⁷³⁴ There may also be a dual holdup (a deadlock), if the original innovator would not be able to access the improvement – and if that original innovator would refuse a license for that initial innovation to the improver. Society would in such situations be better served by at least a cross-license.

2.1. Patent pools and the problem of dependency and free riding

Patent pools have emerged as a private mechanism to overcome the prohibitively high cost of negotiating and obtaining many individual licenses. Such pools have been designed to lower those transaction costs when many different complementary asset holders (intellectual property holders) must be accessed. They then require interfacing with only one entity through only one contract: namely one license from the pool.

Such pools may thus be mutual institutions, but also commercially created (instead of mutually owned) pools may exist.⁷³⁵ Commercial entities may indeed also buy intellectual property, and resell, like vendors of intellectual property blocks for systems on chips. Commercial repositories of software components are another example. Organically grown trends in semiconductor and software architecture also spur a trend towards externally accessing complementary resources – and to aligning whole industries to generally accepted interfaces. If no dominant standard emerges organically, then they may require express standardization –which will be discussed next– to make the exchange swift and cheap. In case of a mutual organization to license a pool of intellectual property, then it can also act as the coordinator to create and design the standards for the interfaces, if no such dominant standards arise in the market (potentially sponsored standards).

But factors that may hinder the emergence of patent pools are coordination failures: besides the failure to create such infrastructure on a mutual or commercial basis (as discussed previously in relation to conductive trust and transaction infrastructure), it is here mainly the failure to have incentives for the intellectual property holders to offer licenses to the pool (and thus to cooperate instead of compete). Especially holders of

⁷³³ Carl Shapiro, 'Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard Setting' (David K Levine 2004) Levine's Working Paper Archive <<http://econpapers.repec.org/paper/clalevarc/12224700000000539.htm>> accessed 14 June 2013; Dr Chiara Rosazza Bondibene, 'A Study of Patent Thickets' (National Institute of Economic and Social Research 2012) NIESR Discussion Paper 11129 <<http://ideas.repec.org/p/nsr/niesrd/11129.html>> accessed 14 June 2013.

⁷³⁴ Robert P Merges, 'Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents' (1994) 62 Tennessee Law Review 75.

⁷³⁵ Via Licensing (<http://www.vialicensing.com>) is an example of a commercial patent pool operator. The Radio Frequency Identification (RFID) consortium is a n example of a mutual organization to organize a patent pool.

essential intellectual property that do not require any license from the pool for their own activities (i.e. non producing entities) may rather opt to for a holdup strategy, or may free ride on the efforts of the pool or on the increasing adoption of neighboring technology – which will also increase the dependency on the essential technology. No special support is granted in today’s law- and rulemaking. This may again shift the required governmental support away from policymaking (co-sponsoring infrastructure) and towards lawmaking.

A “tragedy of the anticommons,” is most outspoken when there are numerous property right claims to separate building blocks for some product or some line of research. In some domains, the number of patented technologies that can be incorporated into a final product increases as well, which potentially increases the need to obtain licenses from third parties – a situation that is known as stacking and that has already been mentioned before. In chemical, biotech and pharmaceutical industries is it for instance still common that a final product or substance is only covered by one patent or a small number of patents⁷³⁶ – which may even lack the need to contract with third parties as it may be created in-house due to the vertically integrated nature of those industries. Those industries are still capital intense, have economies of scale and are less driven by customer sophistication or a consequent need for constant innovation to maintain market share. But, in industries like electronics, automotive, mechanics or electromechanics is it already very normal that one product may incorporate a large number of protected technologies for which a large number of licenses from third parties may be necessary.⁷³⁷ Also domains such as biomedical innovation have become susceptible to that as well.⁷³⁸ When these property rights are held by numerous claimants (especially if they are from different kinds of institutions), the negotiations necessary to their combination may fail, and this may destroy the pursuit of otherwise promising lines of research or product development. Such products that require a lot of licenses, and that include a lot of intellectual property to produce and sell, can be called non-discrete or complex products. This is in contrast to discrete products that are only recognized by one or a small number of intellectual property protected aspects.

Mechanisms to prevent holdup and free riding that comes at an imbalance for the societal wealth should best be foreseen in the legal infrastructure that creates the existence of intellectual property rights.⁷³⁹ However, a deeper discussion about finding an optimal balance falls outside the scope of this study. Advocating mechanisms that would increase the transactional availability of intellectual property would need to tweak the principle that allows creating fences around protected products through thickets of patents that will never be licensed (to prevent others from designing and

⁷³⁶ Gerrit Reepmeyer, Oliver Gassmann and Frauke Rüter, ‘Out-Licensing in Markets with Asymmetric Information: The Case of the Pharmaceutical Industry’ (2011) 15 *International Journal of Innovation Management* 755.

⁷³⁷ Adam B Jaffe and Joshua Lerner, *Innovation and Its Discontents: How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do about It* (Princeton University Press 2004).

⁷³⁸ Michael A Heller and Rebecca S Eisenberg, ‘Can Patents Deter Innovation? The Anticommons in Biomedical Research’ (1998) 280 *Science* 698.

⁷³⁹ Bronwyn H Hall, ‘Patents and Patent Policy’ (2007) 23 *Oxford Review of Economic Policy* 568.

selling substitutes instead of merely protecting against direct copies).⁷⁴⁰ It would also touch the principle possibility to only use patents as a bargaining chip or as a currency for cross-licenses with competitors.⁷⁴¹ A complete discussion about optimal intellectual property law design, where fighting market incompleteness would be balanced with the right to use intellectual property defensively, falls outside the scope of this study as this study mainly focuses on transactional aspects and on coordination mechanisms. The production and distribution of knowledge is cumulative and interactive, and this needs separate research to find a balance with the inherent incentive mechanism of intellectual property regimes.

The dependency on unique and essential technology may also be under the form of dependency on unique research and development equipment, instead of merely a license to use a patent. Such research and development tools can be unique complementary assets in their own right as there is a proliferation of patents on research tools.⁷⁴² The providers of such tools may also be specifically interested to use customized contracting to offer the usage of these patented tools. The dependency on it may be an underlying power tool. The terms of so-called material transfer agreements (MTA's) can have restrictions on the use of the final product. To avoid the first sale doctrine under some intellectual property laws, providers of tools and materials now even opt to lease the tool or the material.⁷⁴³ The users of the materials or the tools are generally in a situation that they are incapable to economically produce these tools or materials themselves, and have a low bargaining position and rather a take-it or leave-it (holdup) position. A number of clauses in such MTA agreements are worth mentioning here. Reach-through clauses sometimes ask for royalties on any product that might eventually be developed through use of the tool. This creates thus another source of costs stacking, just like the situation that has already been described where many individually negotiated licenses would come at a prohibitive cost. Another typical clause is a grantback clause. Grantback clauses foresee that the researching party will be granted a license for the improvements that it made.⁷⁴⁴ Also open source contracts often include such grantback system.⁷⁴⁵ This is actually a good element, from the point of view that it can prevent a deadlock situation. However, terms may also exist where all new intellectual property will be attributed to the party that provides the material. However, it becomes really problematic if material is used from different providers because they can all start to claim ownership of one single indivisible improvement – and a failure to coordinate between them would halt the usage of such tools and the potential to create new products.

⁷⁴⁰ Ian Hargreaves, 'Digital Opportunity: A Review of Intellectual Property and Growth: An Independent Report' (2011).

⁷⁴¹ Federal Trade Commission, 'To Promote Innovation: The Proper Balance Of Competition and Patent Law and Policy' (Federal Trade Commission 2003); Bogers (n 685); Rosemarie Ham Ziedonis, 'Don't Fence Me In: Fragmented Markets for Technology and the Patent Acquisition Strategies of Firms' (2004) 50 *Management Science* 804.

⁷⁴² Heller and Eisenberg (n 738).

⁷⁴³ Michael A Carrier, *Innovation for the 21st Century* (Oxford University Press 2011).

⁷⁴⁴ Sean M O'Connor, 'Controlling the Means of Innovation: The Centrality of Private Ordering Arrangements for Innovators and Entrepreneurs', *Handbook on Law, Innovation and Growth* (Edward Elgar Publishing 2011).

⁷⁴⁵ Christian H Nadan, 'Open Source Licensing: Virus or Virtue' (2001) 10 *Texas Intellectual Property Law Journal* 349; Arti K Rai, 'Open Source and Private Ordering: A Commentary on Dusollier' (2007) 82 *Chicago-Kent Law Review* 1439.

Similar to research and development tools, embedded software is today also used as such complementary asset with a high degree of counterparty dependency – and a situation where the software provider can set the terms. Since we see a shift of innovation from mechanics and chemistry to IT, software and biotech, it also means that especially software is becoming an embedded factor in many innovations.⁷⁴⁶ This increases the dependency on license providers. Software is protected through copyright but potentially also patent and trade secret rights, but there usage is still offered through licenses.

Dependency is also particularly peculiar when intellectual property is an essential part of a standard. The wide adoption increases the dependency on essential patent holders – thereby increasing the holdup and free riding incentives. Switching costs to step away from a standard are so costly (and requires coordination) that the holder of a necessary patent can exploit this dependency as more room for extra rent-seeking. He might still have a higher interest in offering individualized licenses to reap more of the buyer's surplus – but these come at a substantially higher transaction cost for the counterparties, or possibly at a higher accumulation of transaction costs for the counterparties.

A cost to society is present when a pool represents a standard and when the members want to use that as instrument for rent-seeking. In the theoretical part, it has been discussed that standards lead to network effects (increasing returns). This may potentially offer an incentive to opportunistically exploit the dependency of those who need licenses – and who suffer high switching costs to escape the standard (even if this would happen in a coordinated manner, by multiple parties that join and mobilize to step away from a standard). This can even create an incentive for the standard setting organization, to have as many users as possible implementing the standard, because of network effect that increase returns on adopting the standard. Then, one can charge exorbitant royalties after luring in users with low royalty rates. The switching costs make sure that there is room for monopoly rents. These are problems that may need tweaks in the design of intellectual property rights – something that has rather been done via antitrust law up until today. Recommending such tweaks fall however outside the scope of this study, and a silver bullet does not exist: it will always be a balancing exercise between the interests of optimizing individual interests, and collective interests.

2.2. Cooperating to design standard licenses or technical standards

Individually negotiated licenses represent a substantial transaction cost, especially when multiple licenses need to be obtained and also when there is a case of ex-post licensing involved where bargaining power may be virtually excluded (in case of intentional or unintentional infringement). Especially in the computer industry, with short product lifecycles and a high degree of innovation sequences, the minimized time to market may lead to infringements to occur. But it is also in this industry where licenses for software components (copyrighted or patented) often exists under the form

⁷⁴⁶ Jaffe and Lerner (n 737).

of standardized non-exclusive licenses.⁷⁴⁷ This supercharges the transaction rate, as individual transaction costs considerably drop. Also the use of standardized technical interfaces helps. Standardized contracts and interfaces can be the result of coordination efforts in an industry, or they can grow organically. The U.S.-based nonprofit and for-profit organizations like the Institute of Electrical and Electronics Engineers (IEEE) or the Component Management Group (CMG) respectively are examples of the former.⁷⁴⁸ They set standard interfaces for interchangeable building components. There exist cooperative initiatives that work on standard licenses as well, like the pro bono open source and free software movements. Standards can be sponsored or unsponsored, and this is not different in the domain of standard license terms.⁷⁴⁹

The literature on the topic of law on open innovation commonly looks into contractual aspect to introduce openness, and to standard licensing terms or templates to promote the spread of such openness.⁷⁵⁰

3. Conclusion

Parallels could thus be drawn between this part and the previous parts. Also in the partnering domain do we face similar needs as in the financial domain: namely the need for conductive market infrastructure and the helpful function of standardization to reduce the cost of frequent individual transactions.

However, the factors that served as roadblocks were different. The emergence of conductive platforms to reduce the transaction costs among the members, is for instance hindered by a lack of commercial incentives – rather than regulatory barriers. This may justify a need for policymaking through co-sponsoring such platforms, rather than lawmaking. Lawmaking then sufficiently supports the existence of such platforms, once they are started. An analytical reasoning showed that such platforms (potentially started through governmental intervention) would at least be more effective than using lawmaking in the domain of contract law to try to decrease the transaction costs between private agents. Indeed, private mechanisms can sometimes be as effective as state-provided mechanisms, or even be more effective.

Another private mechanism was patent pools, which lowered the interfacing costs among firms that do many transactions with a high knowledge-dependent component. Offering one license is more cost effective than many individual negotiations. Such pools may also set technological standards among the users of the technology in the pool, to increase the usage of technology even more. The formation of such pools is also

⁷⁴⁷ Bharat N Anand and Tarun Khanna, 'The Structure of Licensing Contracts' (2000) 48 *The Journal of Industrial Economics* 103.

⁷⁴⁸ <http://www.ieee.org> and <http://www.icmgworld.com>

⁷⁴⁹ Paul A David and Shane Greenstein, 'The Economics Of Compatibility Standards: An Introduction To Recent Research 1' (1990) 1 *Economics of Innovation and New Technology* 3.

⁷⁵⁰ Nari Lee, Soili Nystén-Haarala and Laura Huhtilainen, 'Interfacing Intellectual Property Rights and Open Innovation' (Lappeenranta University of Technology, Department of Industrial Management 2010) 225 <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1674365> accessed 14 January 2014.

not hindered per se by legal roadblocks. The problem here is rather the design of intellectual property law that gives some intellectual property holders the incentive not to join such pools, and that can therefore lead to a breakdown of such pooling incentive. This discussion falls however outside the scope of this study.

Conclusion

A theoretical introduction of this research described the interest in technology-driven firms and the evolution that government interest and government intervention in the domain took. Technology-driven firms have a societal welfare function, they spur macroeconomic growth and they distribute wealth in a region (i.e. through employment and other secondary transactions). Therefore, governments actively want to foster their circumstances. Different types of government intervention have been tested in the past. For instance, governments invested directly into technology-driven companies, or they matched private investments in such firms. Another example is offering downside protection to private investors, whereby the government underwrites the losses (if any). The latter mechanism could for instance also happen through tax breaks, to compensate losses. The research did not study these forms of interventions, but they have been extensively studied in the past – and the strength and weaknesses of these actions are generally known.

Such government investments may recognize a number of truths. First, they recognize that private firms are the main agents to deal with external uncertainties in a technology-driven domain or in an innovative domain with uncertain market adoption. Typical government actions, where the government would directly act in the market, would have little effect under such circumstances. Entrepreneurial risk taking is a form of experimentation to deal with such uncertain circumstances, where deterministic actions would have little effect. Secondly, it recognizes the fact that such firms need capital to survive a long period of no income (a “valley of death”), and that the risk-return metrics may make investments in such firms otherwise unattractive for investors. Thus, such firms may otherwise face an incomplete market when they raise capital.

Most importantly, such forms of government intervention have their limits (and failures). They may for instance forget to take into account complementary framework conditions that may be unique to successful ecosystems. Technology-driven firms need to access more markets than just the market for capital. Often, such firms do not have all complementary resources in-house, or they choose to be so specialized, that they need to partner with other firms to access complementary resources like knowledge or technology. We thus had to look broader than only considering the financing side of technology-driven firms, and this broader concept was largely introduced in the theoretical part. Also, when a market for a particular resource (i.e. capital) is not functioning well, then a government can do much more than just such interventions that are influencing the price mechanism. In a reality where technology-driven firms need to undertake a lot of transactions with many different counterparties (investors, partner firms, etc.), the general transactional infrastructure in the legal infrastructure may be very important as well. Examples of such important forms of lawmaking are contract law and organizational law (i.e. company law, partnership law). In contrast to policymaking, lawmaking is however rarely specifically geared towards one specific type of firm. Nonetheless, enabling lawmaking that specifically caters to the transactions of technology-driven companies should not be excluded. For that, the introduction offered a better understanding of the mechanics and transactions of technology-driven firms, and their external uncertainties. A conducive legal infrastructure is also of utmost importance, as it can make transactions possible where it would otherwise hinder transactions.

Also here, it should be understood that lawmaking is not the magic bullet. It can increase and optimize transactions between private agents like technology-driven firms and their investors or partners. But it cannot create such transactions out of thin air. However, also private mechanisms can optimize such transactions. Private market-driven systems can indeed also offer an enabling environment. The market-driven creation of such mechanisms should also require a level of recognition and a level of support in law- and policymaking. Similar to this, there should also be and accommodation for the possibility of private rulemaking.

In order to come to recommendations how lawmaking should support transactions, or how it should support private enabling systems, this study created an understanding of a number of individual interfirm transactions, as well as collective structures that improve such interfirm transactions that technology-driven firms need to undertake. An important observation in that regard is also a trend of an increasing amount of transactions on the level of technology-driven firms. Both conducive lawmaking as well as private systems may thus want to reduce the cost of such large amount of transactions instead of focusing on reducing the costs of individualized ones. This may require a level of coordination. It put a focus on coordination mechanisms, which are at the current frontier of market failures, and which are at the core of situations with a large amount of transactions. Coordination mechanisms are now at the frontier of research in law and economics. Examples of the attention that coordination mechanism receive, are the introduction of class actions in some legal frameworks, or the design of systems that prevent a disorderly wind down of companies.

The theoretical part identified two types of market-driven coordination systems that would then reappear under different applied forms throughout the study. A first type was conducive infrastructure that allows a better form of coordination between many potential transaction parties: platforms can make individual transactions less costly in terms of search costs, costs to assure oneself of the trustworthiness of a counterparty, and contracting costs to prevent counterparty opportunism. This helps individual transactions of a highly relationship-driven and heterogeneous nature – thus of transactions that have a high transaction cost. A second part of coordination was for setting standard transactional interfaces between firms, which was particularly handy if a large amount of individually negotiated transactions would otherwise be too costly. This is useful for today's setting of distributed agents that could reach surpluses by working together – coordinating to find standardized interfaces could consequently reduce the individual transaction costs between them. Both types of coordination can be understood in the thinking of market infrastructures: instead of organically grown communities, platforms can be seen as a form of market infrastructure. The same is true for standard setting organizations (for the second type of coordination).

The recommended roles of law- and policymakers prove to be different for both of those coordination systems. First of all, many conducive systems can be hindered by the existing legal infrastructure. Examples are for instance crowdfunding and search platforms that stumble upon a wall of securities regulations. Conducive systems should rather be supported, by taking away such barriers. Then, they need potentially even be co-sponsored. Co-sponsoring is however a recommendation for a policymaking intervention instead of a lawmaking intervention – thus contrary to the discourse of the previous paragraphs. It does after all relate to influencing the pricing mechanism

through governmental capital allocation, rather than creating conducive framework conditions to enable private transactions. The need for co-sponsoring is especially the case if incentives would be lacking to let such platform emerge (either as a collective action of the interest group, or from a commercial party that spots a large enough interest group). And while lawmaking should take away barriers and where policymaking should compensate the capital hurdle to form such platforms privately, it should also be noted that lawmaking to try to form such platforms by operation of the law is rather ineffective. Conducive infrastructure is less easy to create by way of lawmaking, but policymaking can certainly sponsor the existence of such infrastructure if private incentives alone would be insufficient. Supporting (lawmaking) and sponsoring (policymaking) such market-driven conducive infrastructure that lowers transaction costs, may even be a better choice than trying to lower transaction costs of individual transactions through lawmaking around such transactions. A most useful role for lawmaking thus exists under the form of taking away barriers for privately created platforms. The useful role of law- and policymakers is however similar in one way and completely different in another way for the second type of coordination systems that are observed, namely for the standardization systems. Private standard setting efforts may be supported in the law, just like conducive transacting systems – this can for instance be through providing organizational types that fit the needs of such standard setting groups or by taking away barriers (barriers in intellectual property law have been discussed). Their different requirements for lawmaking then lie in a negative lawmaking recommendation beyond the elimination of barriers. After all, a state's legal infrastructure can actually put forward such standards, with the same effectiveness as private efforts can do. This is in contrast to conducive systems for transactions. State-driven standardization efforts actually exist, but that these are too overinclusive or too much of a one-size-fits-all nature. The provision of standard corporate types is an example of such state-driven standardization of transactions. But it is also an example of an overinclusive form of standardization as it hinders a number of transactions that exactly need a level of freedom. Especially the financing needs of technology-driven companies are not very well served by the standard corporate transaction framework, and their specific nature rather requires a degree of freedom. Therefore, when states provide standards, they should still offer a level of choice or freedom to recognize the different segments of private agents. For that reason, I encouraged the practice of legal pluralism in law. This recommendation of legal pluralism also applies in a context between lawmakers (thus on an international level).

The recommendation for legal pluralism between states requires a more detailed look. For instance, part two started with a discussion of firms that want to search a large group of investors in a coordinated way, as individual approached would make the search too costly. However, rigid legal infrastructure forces firms to go that individualized route, as the route to address a large group of potential investors is prohibitively costly compliance-wise for firms that have the size of a typical technology-driven firm. Instead of immediately looking at the European lawmaker to come with a better but still harmonized regime, I encourage a pluralistic system that is similar to the situation under company law since the *Centros* case, and that offers a market for regulation: namely a form of pluralism where firms can choose the regulatory regime among a menu of 30 different regimes, to find a best fit. Then, counterparties will face the protections that are chosen by such firms. For counterparties, it does seemingly offers a lower degree of protection – or at least a need to know more (foreign)

protection regimes, but in domains like internet trade is has already been proven that even consumers can adequately protected by the protection regimes of another state than their own.

But for the most part, part two extensively discussed conductive infrastructure between firms and investors. The emergence of internet-based direct access infrastructure to coordinate between firms and investors does however not emerge as such infrastructure is hindered by path dependent securities regulations – as highlighted before. More supportive lawmaking is necessary here. But an interesting point for if such infrastructure would emerge, and which may need a specific form of lawmaking, is the increase of fragmentation. This fragmentation which can however be solved through coordination for which I suggested standardization. This should allow a form of interlinking and a single point of entry. Such standardization may be state-provided, but with a level of care against overinclusion. A similar reconsideration for an existing standardization effort was recommended for the post-trade infrastructure, where a recent state-driven standardization effort proved to maintain high thresholds to let SMEs participate in such infrastructure.

The third part discussed indeed a situation where a form of state-provided standardization actually seemed too rigid and too overinclusive as it also hindered situations in the market where coordination was actually less wanted, and where individual freedom or customization was actually preferred: namely in the design of revenue-sharing investment instruments when a firm deals with a small number of investors, and where the rigid nature of the corporate law and its standard equity instrument is not desired. This was specifically illustrated with the strict recognition of only debt or equity in international fiscal treaties. Corporate law can be seen as a form of state-provided standardization to reduce the individual transaction cost when a firm deals with a large group of anonymous investors with no or little individual negotiation power. However, a too universal application of this standard structure is not desired. This structure makes some overly homogenous assumptions regarding the parties involved. For instance, under agency theories, an entrepreneur may be reduced to an agent like a replaceable scientific manager in a generic capital-driven company – while entrepreneurial companies are rather specific and idea-driven. The agency theory is too rigid as it considers a situation where the capital providers are the most important parties, and where the managers are merely hired to perform repetitive tasks. But this oversees a large number of entrepreneurial agents where their ideas are the main driver or the firm, and where the capital is rather a subsidiary component.

An interesting setting that was discussed in the study and where coordination failures prevented conductive platforms from emerging was the partnering domain in part four. There, it was rather a lack of private incentives that prevented such system from emerging. This illustrated the point that government sponsorship may be recommended to let such conductive infrastructure arise. This is in contrast to the financial domain, where it was not necessarily the lack of commercial incentives to start such platforms, but rather the legal infrastructure that was identified as an obstruction.

In the context of partnering, also in part four, I also described also a case of decentralized market agents that sought to create coordination infrastructure in the domain of licenses. And while the legal infrastructure is sufficient to let coordination

infrastructure arise that would create standard interfaces to let the decentralized members interface with each other, it seemed that the design of intellectual property laws actually allowed a level of holdup that could lead to a breakdown of such mechanisms. This pointed thus to another source of legal roadblocks, but again to a negative recommendation – namely that private coordination mechanisms may in the first place be helped by taking away barriers.

A general observation is that the type of lawmaking that is the result of the first industrial revolution is not adequate anymore. There, the scale of mass production led to shared ownership. Now, we face a situation where the knowledge economy requires the cooperation among different entities and all required knowledge couldn't be found anymore in the hands of one firm. To summarize, lawmaking should now support the creation of private conductive infrastructure or other forms of coordination-standardization infrastructure, instead of hindering it through unexpected ways. In general, there should be more openness for legal pluralism and private initiatives or private autonomy. However, policymaking may potentially have to sponsor such platform in situations where private incentives prevent the creation of it. Lawmaking may also have a role in the domain of standardization, parallel to private initiatives, but it should take care that state-provided standardization would be too rigid or that it would assume overly homogenous private agents.

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