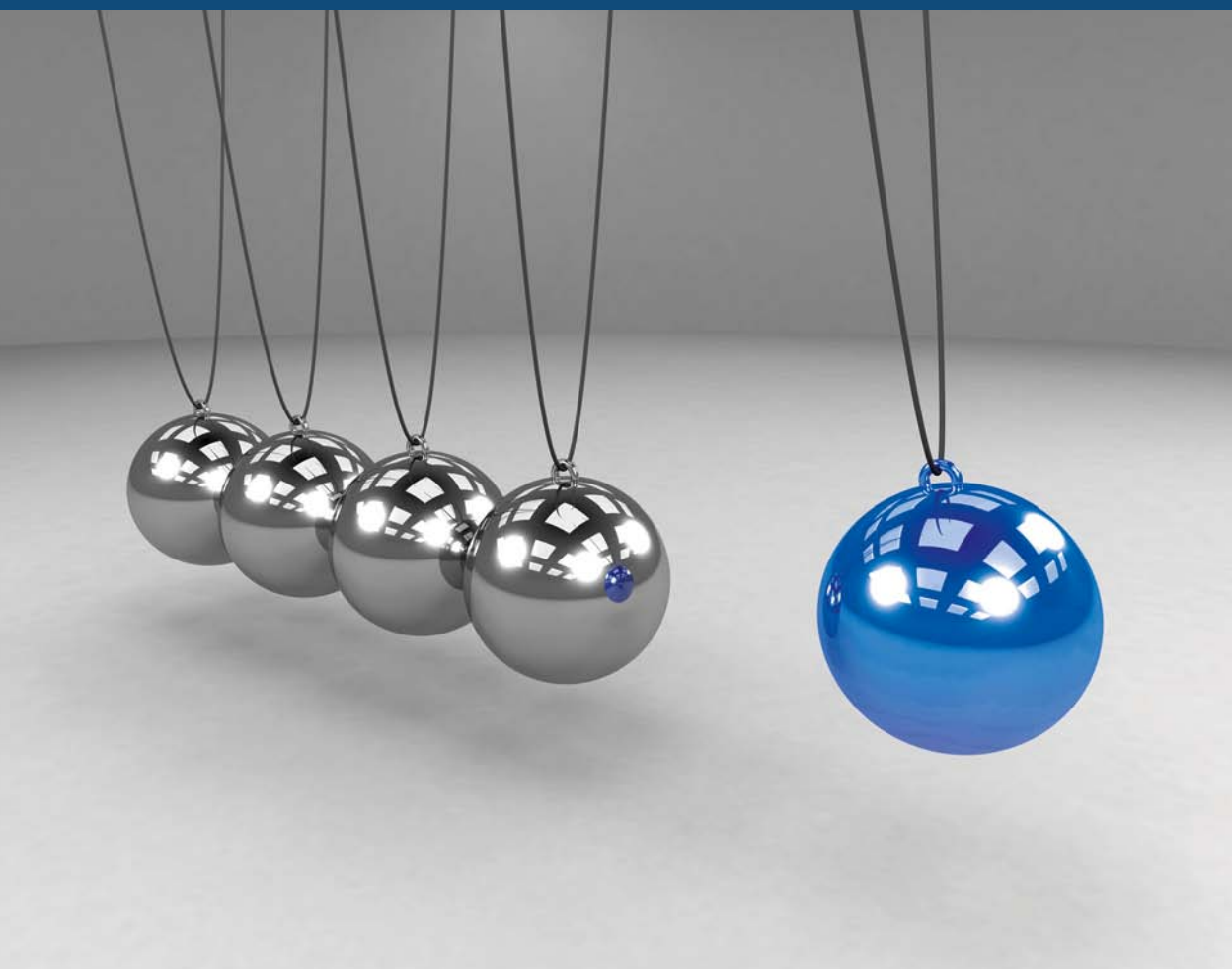
Mastering the Impact of Regulatory Change

The Capability of Financial Services Firms to Manage Interfaces

Åke Freij



STOCKHOLM SCHOOL OF ECONOMICS

Mastering the Impact of Regulatory Change

Throughout history, regulations have been of central concern to business managers, and they remain at the centre of attention in many industries today. Regulatory changes are seen as difficult to handle, and firms often seek to avoid or minimize their impact. Examples of such practices exist today in the automobile, health care and financial services industries. However, a more positive approach views regulatory changes as opportunities. This study investigates what firms do to manage the impact of new requirements from regulatory change, which actions they take to implement new requirements and what separates firms that succeed in the market after the regulatory change from others.

The study covers the 17 years after a regulatory change that radically changed an industry. The actions of six major firms during this time period are presented and analysed, based on interviews with the companies' executives and a review of published research and company and industry documents. Drawing from insights in prior research, the case studies focus in particular on the firms' integration of existing and new products, processes and technology and their use of internal or external providers.

The analysis reveals that the two firms that were most successful in managing the impact of regulatory change were highly proactive in using external providers as well as integrating new and existing products, processes and technology after the regulatory change. These firms displayed a strong capability to manage interfaces both within the organization and with external entities. Based on the findings, the study makes recommendations for business managers on how to manage the impact of regulatory change.

Åke Freij
is a researcher at the Center for Innovation and Operations Management at Stockholm School of Economics. He also works for IBM with business development and architecture. His research is focused on innovation dynamics within industries and companies, with a focus on influences from changes in technology and regulations. Åke believes that regulations are the unspoken voice of the customer.

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To
Ann-Christine, Emma and Jenny

Foreword

This volume is the result of a research project carried out at the Department of Management and Organisation at the Stockholm School of Economics (SSE).

This volume is submitted as a doctor's thesis at SSE. In keeping with the policies of SSE, the author has been entirely free to conduct and present his research in the manner of his choosing as an expression of his own ideas.

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Director of Research
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Andreas Werr

Professor and Head of the
Department of Management
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The completion of my thesis is the end of a journey that started when I found an advertisement for the Stockholm School of Economics (SSE) Executive Research Programme (ERP) in a discarded magazine at the Frankfurt airport in 2007. This journey has been and still is supported by a long list of colleagues, friends and family.

As creators and leaders of ERP, Lars Strannegård and Andreas Werr opened my mind to an entirely new way of thinking, reading and writing. I especially appreciated the chance to join them at the Academy of Management conference in Anaheim in 2008. What an experience for a business guy to mingle with 10,000 researchers!

I am grateful for my sponsors and colleagues at IBM who have supported me through this entire journey and have also helped me to apply my academic knowledge in dialogue with customers. My managers were invaluable, starting with the coaching received from Carl Mikael Dufberg, followed by the strong support from Anna Lena Andren and now the creative mind of Per Jacobsson. Hans Peter Dueholm was a trusted coach through the entire journey, and whenever I called him, I got a brand-new perspective.

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Anders Mårtensson for extensive reviews and creative discussion regarding the thesis and other topics of interest. The product presented here would be far inferior without the diligent support provided by my supervisor, Pär Åhlström. I am truly grateful for his diligent reading and his patience with my frequent inability to transfer what is in my head onto paper.

The solid rock that I held onto during my entire academic journey has been Martin Sköld. Since we met in 2008, we have produced six conference papers and delivered numerous research seminars and presentations from our joint research. I hope that the two of us will continue to form a strong team for future collaboration on the border between academics and business.

Finally, the solid foundation for surviving this dual engagement with IBM and SSE lasting almost a decade has been my family. My brother Per and his family, my mother Laila and my father Olle have been curious about what I was doing, and you have always offered encouraging feedback. My amazing daughters, Jenny and Emma, have been more than supporters; you were also tough reviewers of my texts and gave me countless ideas on how to make this thesis much better. You are true role models for me! Jenny: thanks for the cover picture idea. Emma: thanks for being the best study buddy during summers at SSE. Finally, none of this would have been possible without my wonderful wife, Anki (Ann-Christine). You have tolerated my philosophical wanderings, read my early draft text and changed your vacation plans every year to support my summer writing. You also proposed the idea of comparing firms' integration of new and existing business components (now a central piece of the theoretical framework). For all of this and much more, I love you!

Completing a PhD thesis has been a long-time dream. The journey has made me a different person, hopefully a better one. I will continue my journey with a feeling best expressed by the recent Nobel laureate Bob Dylan, from his song "My Back Pages": "I was so much older then, I am younger than that now."

Stockholm, January, 2017

Åke Freij

CONTENTS

1. FRAMING THE RESEARCH PROBLEM

This chapter explains the importance of gaining a better understanding of what firms do to manage new requirements resulting from regulatory changes, what actions they take to implement the requirements and what separates successful firms in the market from others in this regard. It is proposed that studying these aspects of firm operations will yield valuable insights regarding their evolution and function. The effect on firms is explored by unmasking the complexity and diversity of the impact of regulatory changes on the conditions under which firms operate. These changes have significant impact on industry dynamics, firm positions, integration in operations and the evolution of such arrangements over time. The framing of the research problem is based on observations of historic and current business practices and a review of existing research.

1.1 INTRODUCTION

Regulations and regulatory change are prominent factors in influential theories that seek to explain the evolution of industries and the different positions of firms. Such factors are present in transaction cost economics (Williamson, 1985), evolutionary economics (Nelson & Winter, 1982) and theories underpinning the understanding of firm resources and entrepreneurship (Penrose, 1959). It is thus widely acknowledged that regulations influence how firms manage their business. They affect, for example, decisions concerning the integration of products and processes (Jacobides & Winter, 2005) and how to apply new technology (Teece, 1986; Pisano & Teece, 2007).

Despite this recognition of the importance of regulatory change, the actual influence of specific regulatory changes on firms has not been as fully

explored as the impact of changes in technology and customer demands (Reger, Duhaime & Stimpert, 1992). One call for additional research in this area stated, "Since regulatory control of one sort or another is present in virtually all industries, this factor should receive more attention in the future" (Wiseman & Catanach, 1997, p. 824). Brusoni, Jacobides & Prencipe (2009, p. 215) similarly contended, "Since participants often turn to legislatures, regulatory bodies, and courts in their quest for authoritative support for the role adjustments they seek ... it is important to take the patterns we uncovered and consider how exactly actors shape their own environment." This thesis responds to these calls for a better understanding of the influence of regulations on firms (Jacobides, 2005), differences between firms with regard to the management of regulatory change (Lounsbury, 2001) and changes in the practices of specific firms or parts of a firm as a result of regulatory change (Jacobides & Winter, 2010).

Firms can assume different roles depending on how they share tasks across the industry value chain through integration arrangements (Jacobides & Winter, 2005). Such sharing can be modified by changes in regulations, since the conditions for integration can be affected by new regulatory requirements (Funk, 2015). Jacobides (2005, p. 492) articulated the need for a better understanding of these evolving processes in a study of the US banking industry: "The way in which a government or regulator affects vertical specialization and market creation through legislation, through subsuming fixed costs of market infrastructure, or through incentives (such as tax incentives) … remain fascinating topics for future research."

Firms respond in different ways to changes in regulations depending on their management, product offerings and position in the market (Smith & Grimm, 1987). Once the new requirements arising from a regulatory change have been presented, firms can take a range of actions in response (Levitt, 1968). A better understanding of the impact of regulations could reveal differences in these responses and thereby uncover key dynamics related to firm strategy, innovation and operations. Lounsbury (2001, p. 29) noted, "We have little understanding about why organizational responses to institutional pressures differ."

The actions taken by firms in reaction to regulatory changes will in turn affect firm operations. Such effects will depend on how each firm seeks to acquire or develop the assets to deal with the change (Ferraro & Gurses, 2009). "We know little about how these new practices changed the operation of institutions and individuals within the sector" (Jacobides & Winter, 2010, p. 2). Regulatory change not only affects the firm as a single unit but also creates the need for various actions in different parts of the organization (Jaspers, Prencipe & Ende, 2012). The actions required from the technology management part of the organization might be quite different from those incumbent upon the legal department or upon those responsible for implementing new products and processes (Pisano & Teece, 2007). To properly understand the requirements generated by regulatory change, consideration should be given to the impact on each part of a firm, as these potentially differing requirements could influence integration arrangements (Jacobides, 2005).

A starting point for gaining greater understanding of the divergent requirements arising from regulatory changes is to identify opportunities to "track the relations between exogenous environmental shocks and organizational choices" (Ferraro & Gurses, 2009, p. 234). The approach in this thesis, as its starting point, considers regulatory change as an external factor to the firm. This approach is in line with previous research on similar topics (e.g. Tee & Gawer, 2009, p. 218). Nevertheless, the role of firms in the advent of regulations is also acknowledged, since "in many sectors today, including healthcare, financial services, public services and other important parts of the GDP that remain unstudied, political forces and lobbying can play a substantial role, not only in supporting any one architecture, but also by discouraging other alternatives" (Jacobides, Knudsen & Augier, 2006, p. 1204). Firms can be proactive and reactive, and they can take either supportive or opposing positions towards new regulations even before they are presented. Regardless of the positions of actors before a regulation is introduced or of the firm´s involvement in the process of introducing the change, the enactment of a change compels implementation actions by creating new requirements related to products, processes and technology (Pisano & Teece, 2007).

Current research and practical discussion frequently consider how firms avoid, minimize and influence regulations to their advantage, but less often on how firms embrace and implement new regulatory requirements. Firms sometimes seek to avoid adverse impact of regulatory change by favourably influencing regulators ("regulatory capture"; Dal Bó, 2006). Or they may try to circumvent regulations by introducing new products and processes that are not fully covered by a regulation (Funk & Hirschman, 2014). The present thesis does not focus on these tactics. Rather, it concentrates on what happens when new regulations are embraced and implemented. In this way, it contributes towards understanding firms' responses towards changes outside their direct control. The actions described herein will provide insight into firms' adaptation to exogenous changes.

In this introductory chapter, I will next discuss how regulations and regulatory change are perceived from the view of both past and present business practitioners and researchers. After that, research literature on the phenomenon of regulatory change is reviewed across theoretical fields where actions by firms to manage the change have been detected. Finally, the research problem and research gap will be synthesized, leading to an articulation of the purpose of the thesis and the related research questions.

1.2 BUSINESS MANAGERS ARE CHALLENGED WITH REGULATORY CHANGE

"We have five or six regulators or people coming after us on every different issue. It's a hard thing to deal with." The CEO of one of the world's largest banks voiced this concern when presenting a quarterly earnings report that included significant legal expenses related to compliance with new regulations. The statement even depicted the situation as "assault by regulators" (Son, 2015). The investment in regulatory requirement implementation was perceived as in direct conflict with the need to create business value for the firm and its customers. The concerns voiced here are not limited to this particular company, but are commonly described with terms such as "headwinds" ("Citi says," 2015). Similar examples can be found in the automobile industry's experience of emission control

regulations, where some companies have used technology to try to circumvent rather than embrace requirements, occasionally with negative effects for the firm and its customers, of which the 2015 emission scandals was an example (Hotten, 2015). In the US mortgage banking industry in the early 2000s (culminating in the crisis that broke out in 2008), "work-around solutions" to new regulations led to the creation of products and processes that almost destroyed the entire financial sector (Jacobides & Winter, 2010). Some banks continue evasive responses to regulation today in the form of so-called "shadow banking" (Worstall, 2015), spending resources to avoid rather than embrace and implement new regulatory requirements.

The difficulties involved in managing the impact of regulatory change are not a new topic. It has been said that the business executive "welcomes new things in his business, but not in the relationship of his business to his government and his society" (Levitt, 1968, p. 81). Businesses are open to and eager for change, as long as the change does not occur as a result of regulations issued by authorities. In such cases, the initial thought is usually that the regulation is bad and that it therefore should be ignored or avoided if possible, or at least that the impact should be minimized. Efforts to avoid regulations have been described as "executive blinders" (Levitt, 1968, p. 82), which means that businesses do not see the potential inherent in regulations but instead close the door to business opportunities. As a consequence, both practical and academic observations have indicated that it is difficult for firms to implement regulatory change requirements. This thesis will approach regulatory change not just as an obligation requiring compliance, but instead as a possibility for firms to improve their position.

1.3 REGULATORY CHANGES INFLUENCE OPERATING CONDITIONS OF FIRMS

When considering how new requirements from regulatory change influence firms' operating conditions, both business executives and academics find two opposing results. On the one hand, firms have an opportunity to adapt when regulations change and thereby become more likely to succeed than firms that do not change (Smith & Grimm, 1987). Firms that are active in

understanding the view of regulatory agencies and then manage to implement new requirements in their business can fend off competition (Polidoro, 2013). The development of new capabilities and resources (rather than purely reactive regulatory compliance) in the turbulence created by regulatory change can contribute to a firm's success (Pettus, Kor & Mahoney, 2009). On the other hand, failure to implement requirements related to a regulatory change may occur due to organizational constraints, leading in turn to new restrictions that lead to increased risk for organizational failure (Gruca & Nath, 1994). If firms fail to see the possibilities inherent in regulatory change requirements, but instead address them only as factors restricting the firm and not as new opportunities, they can end up as losers in the market (Levitt, 1968).

The conflicting results of the impact of regulatory change are readily apparent in the environmental industry. Here both authorities and firms are torn between the desire to introduce new and innovative solutions and the need for safe and secure implementation. Actors who want to implement new solutions in the environmental technology industry need to consider regulatory change requirements with great care. Regulatory change can hamper opportunity but can also be the springboard for new firms and solutions in the market (Yonk & Hansen, 2013).

When firms implement new requirements resulting from regulatory change, the importance of shifting industry boundaries and interfaces in relation to regulating authorities demands consideration (Jacobides et al., 2006). The authorities are providers of the social technology that influence how innovations are adopted (Teece, 2006). Actors seeking to understand the opportunities inherent in changed regulations consider how they could leverage these to "shape their own environment and affect the division of knowledge and power" (Brusoni el al., 2009, p. 215). Regulations affect firms' ability to develop a business, as they provide the foundation for and constrain the launch of a new business in a market (Tee & Gawer, 2009). The changes in interfaces between organizational fields that follow the enactment of new regulations can create opportunities (Ferraro & Gurses, 2009). In the next subsections, I will discuss both the restrictions and the opportunities.

1.3.1 RESTRICTIONS ARE CREATED BY REGULATORY CHANGE

Changes in rules and regulations are often viewed primarily as new restrictions on conducting business.[1] They can limit how firms design, develop and market products, services or solutions for their customers. For a business entrepreneur, regulations might be seen as a hurdle, since compliance requirements might hamper ambitions for business growth (Penrose, 1959). Regulations force firms to make investments in projects that they *must* do, often in stark conflict to what the firm "wants to do" (e.g. innovation or product development).

Historically, for these reasons, the gut reaction from managers has often been to oppose regulations. Notable examples include resistance to child labour laws (Mintzberg, 1984), regulations that allow trade unions, transparency in capital markets and rules that facilitate public health care (Levitt, 1968). Even today, resistance is often manifested in industry responses to regulatory changes. One recent example is the response by the Swedish insurance industry association to new EU regulations requiring additional reporting, provision of information concerning advice to customers and the provision of products, which the insurance companies described as too complex and not ready for implementation ("Debatt", 2015).

One example of a regulation seen as limiting business opportunities is the introduction of requirements to document customer relationships and financial advisory processes. Regulations have changed as a result of local authorities in separate countries implementing new EU directives, leading to requirements known as KYC (Know Your Customer). Insights obtained from the KYC process have also been incorporated in new regulations designed to hinder money laundry (Roebuck, 2012; Valcke, Vandezande & van de Velde, 2015). The new regulations have introduced increased responsibility for financial services firms. Now, firms need to prove that proper advice has been given to the client on a level of understanding

[1] The organizational unit within firms that manages regulations is often referred to as "compliance", which means "to yield to the demand of others".

corresponding to his or her knowledge about investments. The process requirements introduced could reduce some firms' ability to offer advice, with the result that only a limited set of clients would get high-quality services. On the other hand, these new needs could open up business opportunities for other firms.

1.3.2 REGULATORY CHANGES RESULT IN BUSINESS OPPORTUNITIES

Regulations can create significant new business opportunities since they often infuse radical effects on industries and firms, such as when the huge oil monopolies were dissolved in 1911 in the US (Levitt, 1968). Regulations can accelerate significant technological and product innovation, such as by mandating the introduction of electric vehicles (Dyerson & Pilkington, 2000). They can contribute to changes in an industry by introducing increased heterogeneity in products and services, a trend seen in the banking industry in several countries (Roberts & Amit, 2003). Another example of such change was the launch of regulations aiming at "zero emissions" in California in 1998 (Pilkington & Dyerson, 2004). Regulatory change has also contributed to the birth of organizations fundamental to the modern financial capital industry, dating back to the banking business in Renaissance Florence (Padgett & McLean, 2006).

Regulatory change in the business of securities trading has made it possible to launch new products and solutions and to access new customer segments. One example is the implementation of the MiFID (Markets in Financial Instruments Directive) regulation in the financial services industry. This regulation has had great impact on the market's structure and created a number of new actors that compete for profits with previously existing firms in new ways. The changes also benefited existing firms that embraced and implemented the new requirements.

One intriguing example of opportunities and challenges arising from regulatory change can be seen in the healthcare industry (Ray & Norbeck, 2013), where new actors focused solely on supporting regulatory compliance processes for other organizations have emerged. The introduction of new

regulations concerning patient records and electronic processes has called for the development of solutions related to technological and regulatory compliance. At the same time, there is a risk that a focus on technology and regulatory compliance could take attention away from treating the actual patient (Friedberg et al., 2013).

Regardless of how regulatory changes are perceived, they will influence the structure of industries and thereby also the position and fortune of firms. Firms are obliged to understand that regulations will generate new requirements and consider how best to manage implementation. By understanding regulations as a key influencing factor, firms can identify new opportunities offered by the processes of regulatory change. The difficulty of understanding regulatory change is exacerbated, however, by the complexity of the phenomenon.

1.4 REGULATORY CHANGE IS A COMPLEX PHENOMENON

Regulatory changes are an exceedingly complex process, generated by forces that no individual or firm can master or predict (Tee & Gawer, 2009). Moreover, its impacts are also difficult to understand and master (Jacobides, 2005). The complexities associated with regulatory change accentuate the importance of understanding what firms can do to manage the new requirements involved. The diverse forces that create new regulatory requirements include lobbying (Jacobides et al., 2006), political desires (Cacciatori & Jacobides, 2005), deregulation interests (Funk, 2015) and requirements from customers (Brusoni, Prencipe & Pavitt, 2001).

1.4.1 DIVERSE FORCES ARE BEHIND REGULATORY CHANGE

The forces behind changes in regulations are diverse, emanating from firms, policymakers and regulators (Jacobides et al., 2006). Firms can turn to regulatory bodies or guidance on how to adjust to regulations (Brusoni et al., 2009). Ferraro and Gurses (2009), in their study of the American movie industry, observed that when interfaces between firms change (as occurs in situations of technological and regulatory change) there is an opportunity to

renegotiate the structure of an industry. At this point, firms can acquire assets that will appreciate once the structure of the industry changes. Through such actions, firms may utilize the regulatory framework to advance their individual or collective interests. The ownership of specific assets could contribute to the firm's ability to act in connection with regulatory changes (Anderson & Tushman, 1990).

Firms can take a proactive approach by becoming involved in the events leading up to a regulatory change, but despite such engagement, the cumulative result of individual decisions is still beyond the immediate influence of even the most farsighted actors (Tee & Gawer, 2009). The difficulty that firms and managers face in understanding the big picture of regulatory change was clearly formulated by Jacobides and Winter (2010, p. 31 note 12) in their study of the US mortgage banking industry: "We found that most regulators and industry participants neither had a good understanding of the overall structures in the late 1990s, nor a sense of the sector evolution. Firms, executives and regulators might know full well their own 'part of the puzzle' but did not have much of an understanding of the broader context." Lack of oversight may lead to unpredictable results due to interactions between the actions of firms and regulators (Tee & Gawer, 2009). Therefore, even if the firms have been proactive in advance, the regulatory change needs to be understood and implemented (Pisano & Teece, 2007).

Political desires can aim at removing privileges for actors supported by regulations (Burrage 1992). Removal of regulatory barriers and the weakened influence of professions can influence the structure and organization of an entire industry (Cacciatori & Jacobides, 2005). Regulatory changes thereby influence the appearance of new firms in an industry (Dobbin & Dowd, 1997). Regulatory measures designed to influence industries are diverse and difficult to understand, since they are likely to vary between countries and political regimes as well as over time (Ansari & Krop, 2012). Creation of opportunities by firms can be seen in connection with the evolution of professional guilds, as changes occurring in regulatory frameworks can impact the formation of business careers (Mackenney, 1987; Padgett & McLean, 2006).

One specific type of regulatory change often mentioned as a creator of new requirements is deregulation,[2] which can enable new actors to enter a new industry due to changes in the competitive environment (Fuentelsaz, Gomez & Polo, 2002). Such changes in regulations can foster competition in an existing industry by introducing new products, services, back-office processes and distribution technologies (Roberts & Amit, 2003). It has been shown that deregulation can either increase or decrease innovation opportunities in an industry by changing the cost of distribution (Funk, 2015). A deregulation process influences both small and large firms as well as new entrants due to its influence on how products are designed and priced (Madsen & Walker, 2007). On the other hand, increasing regulatory pressure (which could be called re-regulation) also creates new requirements that demand implementation actions when new models of assessment of the business are implemented (Fox-Wolfgramm, Boal & Hunt, 1998). Hence, any regulatory change, whether increasing or decreasing requirements, is of interest for a study of what firms do to manage the impact of these changes.

For every business firm, the customers are the centre of attention. Therefore, any business would rather create new products and services for its customers than implement compliance towards regulatory changes. However, concerns expressed by influential customers could heighten the challenges imposed by regulatory changes (Brusoni et al., 2001). Firms can sometimes assist their customers by implementing solutions to comply with a regulation (Salvador, Forza & Rungtusanatham, 2002). Integrating regulatory compliance into the products and processes provided could thereby present a business opportunity (Richard & Devinney, 2005). If the argument for supporting customers is extended, regulatory changes could always be viewed as an interpretation of customer requirements, since they are the result of a political process in which the customers participate as

[2] Deregulation is generally described as a situation where the burden of regulation is decreased. In this thesis, the focus is on changes in regulation, regardless of whether they are perceived as increasing or decreasing the regulatory burden. Deregulation does not remove all regulations; rather, it involves a change to a different (and for some actors less cumbersome) regulation. I contend that there is no such circumstance as an unregulated industry (e.g. Wiseman & Catanach, 1997), since in almost all societies, some form of regulation frames the business activities performed by firms. This point is discussed further in chapter 3 on research methodology.

citizens and are thereby part of the force behind any particular regulation (Levitt, 1968).

1.4.2 THE INFLUENCE OF REGULATORY CHANGE

The second aspect of complexity concerning regulatory change involves the situation that follows their enactment. There are four main ways in which regulatory changes induce influence. The first area is the evolution of well-defined approaches to the product and service design (so called dominant designs), which can arise from the implementation of regulations (Anderson & Tushman, 1990). One such approach can be in the form of standards. Second, regulatory demands can change conditions for firm collaboration due to new challenges in the interface between actors (Jaspers et al., 2012). A third area is the modification of technical requirements arising from regulatory change (Abernathy & Clark, 1985). Finally, firms can explore the expiration of legal protections to their relative advantage (Richard & Devinney, 2005).

As industries evolve, certain ways of conducting a business and designing products and services tend to dominate, emerging as widely adopted ways to configure products and systems (Murmann & Frenken, 2006). The evolution of dominant designs takes place in a process that includes social, political, technological and economic forces (Benner & Tripsas, 2012). These designs emerge by means of a trial-and-error process after breakthrough innovations as manufacturers, suppliers, customers and regulatory agencies compete to reduce variation in products, processes and technology (Abernathy & Utterback, 1978). A decrease of uncertainty includes the role of establishing well-defined interfaces for integration (Jacobides, 2005). One particular approach to establish such interfaces is standards (Funk, 2003), or defined templates that stipulate how to perform tasks. Standards can thereby contribute to the establishment of stability (Kenney & Pon, 2011). Government regulation often compels the adoption of standards, and firms can contribute to the development of these standards (Anderson & Tushman, 1990). Cross-national agencies and regulatory bodies promote standardization so as to encourage firms to sell

the same product across national markets (Salvador et al., 2002). Nevertheless, companies must often comply with different regulations and country-specific constraints, which might limit flexibility (Salvador et al., 2002). From another perspective, the lack of agreement on a dominant design can hinder innovation in a market (Ozcan & Santos, 2014). As exemplified by mobile payments, when there is a lack of clear regulations, investments will be made towards unclear criteria and hence hamper the development of integration and collaboration (Ozcan & Santos, 2014).

Regulatory change can influence the conditions for collaboration between firms. Such collaboration requires integration through interfaces, and regulatory forces can create limitations to interfaces that constrain operational activities (Chen & Liu, 2005). In addition, some firms might be concerned about security and reliability issues imposed by regulations when considering collaboration with other firms (Jaspers et al., 2012). Companies know that violations of specific regulations could seriously harm, the company's image as trustworthy (Jaspers et al., 2012). Such regulations may limit the combination of complementary resources and capabilities, especially in cases of collaboration across industry boundaries to develop new products and services (Jaspers et al., 2012). Hence, regulatory circumstances can require a more clearly articulated governance structure for cooperation between firms, which will involve additional coordination costs (Gulati & Singh, 1998). The actions of regulators can thereby influence the level of integration between firms as well as the conditions for integration (Hobday, Davies & Prencipe, 2005). Corresponding decisions to combine products and services with assets from other firms is influenced by regulations driving new technical requirements (Teece, 1986).

New regulations imposed on an established industry, as well as deregulation, may establish new technical requirements or demand changes in performance standards that favour revolutionary or architectural strategic development of products and processes (Abernathy & Clark, 1985). Industry incumbents, constrained by regulatory and institutional logics, react to external events such as new technical requirements or regulatory change, and their actions create a space for newcomers to acquire mispriced resources (Ferraro & Gurses, 2009). Government or regulators can

influence the development of market infrastructure and affect the role of technology, thereby influencing firms' implementation decisions (Jacobides, 2005). Hence, changes in regulations might escalate or kick-start the diffusion of a technical requirement under development (Anderson & Tushman, 1990). It has even been argued that regulatory change is the only way to create better understanding and broader diffusion of a new technology (Teece, 2006).

Over time, products and processes become understood as the technology supporting them becomes widely available through the diffusion of knowledge and as legal and regulatory protections such as patents expire (Richard & Devinney, 2005). As a response to such changes, firms can investigate the integration of regulatory compliance into their product offerings. This step can expand a firm's role by creating assured bundles for their customers (Richard & Devinney, 2005). The action to manage the interpretation and implementation of regulatory requirements can thus be moved from the firm´s internal processes to outside vendors and partners (Brusoni et al., 2001). The regulatory frameworks enable new markets and interfaces between private firms to take off, and as such they prompt the emergence of a new mode of organizing. Regulation tends to either institute or legitimize new rules, such as vertically co-specialized arrangements between different firms (Jacobides, 2005). In the financial services industry, previously integrated sectors (and privileges of firms) have been taken apart, partly as a result of changed regulations (Jacobides & Winter, 2005).

Actions related to the implementations of new requirements arising from regulatory change will impact the position of firms vis-a-vis other firms, customers and regulators and thereby change the patterns of integration in an industry (Hobday et al., 2005). The ecosystem involved in changing integration processes includes not just firms but also regulators, educational institutions, standard-setting bodies and the courts (Teece, 2006). The combined effects of firms acting to implement new requirements in connection with regulatory changes can be equated to integration in complex systems, which means that they are quite difficult to manage (Hobday et al., 2005).

1.4.3 FIRMS FACE DIFFICULTIES IN IMPLEMENTING REGULATORY CHANGE

The complex impact of a change in regulation makes it difficult for firms to manage the implementation of corresponding new requirements. Regulatory change creates different types of new requirements (Abernathy & Clark, 1985), influences the role of new and existing products and services as well as how they are connected (Henderson & Clark, 1990) and results in new processes that affect the role of internal and external providers and the interfaces between them (Jacobides & Winter, 2005). Regulatory change is a complex phenomenon that is difficult for individual actors to understand and predict (Tee & Gawer, 2009). Regulations and regulators are central actors in complex systems for innovation (Hobday et al., 2005). These systems create opportunities for actors with system integration capabilities that enable links between firms, regulators and innovations (Hobday et al., 2005). Regulatory change can introduce modifications into the strategies of firms or even entire industries by introducing new paradigms for products and processes (Dosi, 1982). New regulations have the potential to change the "system of systems" that establishes the framing of an industry made up of complex interconnecting components (Hobday et al., 2005).

Changes in regulations due to actions by regulating authorities introduce modifications in the architecture of industries (Ferraro & Gurses, 2009; Funk, 2015; Jacobides et al., 2006; Pisano & Teece, 2007). Such changes in architecture influence the value of ownership of assets that are complementary to the innovations presented by individual firms (Ferraro & Gurses, 2009; Jacobides et al., 2006; Teece, 1986, 2006; Tripsas, 1997). These complex dynamics require firms to understand how to perform integration tasks in a complex system (Brusoni et al., 2009). Knowledge of how to act when regulatory change influences an industry is described to as architectural knowledge (Richard & Devinney, 2005). Regulatory change can introduce new roles for actors such as agents, intermediaries, integrators, product and process providers, and owners of manufacturing facilities (Ferraro & Gurses, 2009). Actors can establish themselves in the role of providing interfaces to verify quality as a complementary process to the

impact of the regulatory change (Jacobides et al., 2006). This role, which evolves with changes in regulations, responds to consumers' desire for legitimate structures (Jacobides et al., 2006).

The ways in which regulatory changes influence firms have been observed in various industries. In radio broadcasting, regulatory changes gave new firms a chance to enter the market by exploiting new products, processes and technology (Funk, 2015). The market for mobile phones shows how the lack of regulation can hamper the evolution of new products and technology (Kenney & Pon, 2011). Implementation of new services and solutions has appeared in the building construction industry as a result of regulatory change (Cacciatori & Jacobides, 2005). In the mobile Internet market, the status of regulations has influenced firms' ability to introduce services into the market (Tee & Gawer, 2009). Similarly, regulatory changes in the financial services industry have led to the launching of new products and processes (Jacobides & Winter, 2005, 2010; Jacobides, 2005).

1.5 REGULATORY CHANGE DEMANDS NEW MANAGEMENT TASKS

The events described in research on regulatory change underscore the importance of viewing regulations as a source of change and striving to understand their impact as well as potential actions in response. The complex dynamics involved when regulations change create requirements to be managed (in the form of implementations) as new tasks.

Research[3] on regulatory changes and their implementation has been reviewed as part of the present study. Few of the studies actually reported on specific firms and their implementation activities. Table 1 summarizes the relevant studies, including their empirical setting, key findings and calls for further research. The table is grouped in accordance with three management tasks that describe challenges for firms in connection with regulatory change. The first task is to understand industry dynamics (e.g.

[3] The studies listed have been identified using a literature review methodology presented in Appendix A. The primary sources of literature are from research primarily in the fields of operations and innovation with complementary works from organization theory and strategy.

Abernathy & Clark, 1985; Jacobides & Winter, 2010; Teece, 2006). This task describes how the logic of an industry can be affected by regulatory change. The second task is to consider the relative position of firms (e.g. Brusoni et al., 2009; Funk, 2015; Jacobides et al., 2006). The change in industry logic provides options for firms to find new roles in the value chain. The third task relates to integration in operations, in the form of arrangements within and between firms (e.g. Cacciatori & Jacobides, 2005; Jacobides & Winter, 2005). Examples of implications in this category include new products and processes, new sourcing arrangements and new forms of collaboration. My examination of research on each of these three tasks provides a basis for articulating the relevant research gap on how firms manage regulatory change. It is also a starting point for the identification of suitable theories as a framework for studying the issue of firms' management of the impact of regulatory change.

The calls for further research summarized in Table 1 highlight the need to better understand how firms manage the new requirements arising from regulatory change, since this topic is not directly addressed in the reported studies. Also, no studies differentiate the performance of individual firms in responding to new regulations. These two observations provide a foundation for synthesizing the problem and formulating the research gap.

1.6 PROBLEM SYNTHESIS AND IDENTIFIED RESEARCH GAP

The starting point for this thesis was the observation that regulatory change is of central importance to the position of firms but a complex phenomenon to grasp, with the result that firms are generally ill-equipped to manage new requirements in the wake of regulatory changes. Moreover, researchers have not offered models or explanations that could guide firms in resolving this problem. Regulations provide an opportunity for firms to improve their

Table 1. A summary of empirical studies that examined the impact of changes in regulations

Management task	**Publication (authors and journal)**	**Empirical setting: Observations of regulatory change and the implementation of new requirements**	**Summary of conclusions leading to the identification of a research gap, purpose and research question for this thesis**
Understand industry dynamics	Abernathy & Clark (1985) *Research Policy*	US automobile industry Regulations can change technical requirements. These changes can be implemented in the form of standards that are diffused across products, processes and technology.	**<u>Focus on individual firms:</u>** Few firm-specific observations. Focus was on compliance with (and avoidance of) regulations rather than implementation. No focus on how firms implement new requirements from regulatory change. **<u>Call for further research:</u>** Studying (regulatory) change on multiple levels (not just viewing the firm as one unit) will increase understanding. A better understanding of individual firms' responses to changes in regulations is needed. The role of "social technologies" (such as regulations) in the process of the evolving value of firm assets is little explored.
	Fox-Wolfgramm et al. (1998) *Administrative Science Quarterly*	US banking Changes in regulations prompt actions by industry participants. The selected approach to resistance to regulatory change depends on the orientation (e.g. strategic, such as prospector and defender) of the firm.	
	Gurses & Ozcan (2014) *Academy of Management Journal*	US television industry Regulations can both enable and hinder innovative activities by entrepreneurial firms. Understanding regulators and regulations is critical to success in entering a new market.	
	Jacobides & Winter (2010) Working paper (American Economic Association)	US mortgage banking Regulators and their actions have a fundamental impact on innovations in an industry. How firms implement requirements arising from regulations can influence the architecture of the entire industry.	
	Kenney & Pon (2011) *Journal of Industrial Competition and Trade*	Smartphone industry The development of standards into dominant designs might spark interest from regulators. Therefore, an understanding of regulatory requirements is critical to a firm's position in an industry.	

Management task	Publication (authors and journal)	Empirical setting: Observations of regulatory change and the implementation of new requirements	Summary of conclusions leading to the identification of a research gap, purpose and research question for this thesis
	Richard & Devinney (2005) *California Management Review*	Business-to-business exchanges Changes in regulations influence competitive conditions and product design. Firms can integrate regulatory requirements into their offerings to customers.	
	Roberts & Amit (2003) *Organization Science*	Australian banking industry Firms that have experience in innovation perform better in times of regulatory change. Such changes are important factors in driving innovation in an industry.	
	Teece (1986) *Research Policy*	General observations across several industries. Regulations influence the suitability of products in a market. The change of a regulation can be the trigger enabling new products, processes and technology to be accepted for market entry.	
	Teece (2006) *Research Policy*	General observations across several industries. Regulations as supporting institutions are required to enable innovation. An understanding of changes in regulations is critical to achieve value from assets.	
Consider firm's relative position	Anderson & Tushman (1990) *Administrative Science Quarterly*	Cement, glass and mini-computer industries Regulations create new requirements that can be presented in the form of standards. If they evolve into dominant designs, new conditions for firms in an industry are presented.	**<u>Focus on individual firms:</u>** Little focus on differences between firms. Limited focus on actions related to implementation of new requirements. **<u>Call for further research:</u>** A better understanding of the social dynamics of industry standardization (e.g. regulations) is needed.
	Ferraro & Gurses (2009) *European Management Review*	US movie industry Regulatory change influences the structure of industries and the role of firms. Novel practices gradually substitute, complement and rewire the network of industry exchange.	

Management task	Publication (authors and journal)	Empirical setting: Observations of regulatory change and the implementation of new requirements	Summary of conclusions leading to the identification of a research gap, purpose and research question for this thesis
	Funk (2014) *Industrial and Corporate Change*	US broadcasting industry Regulatory change can either create or reduce entrepreneurial opportunity. Pressure on existing firms from regulators to change their business practices creates new requirements.	It is unclear how industry practices (such as regulations) complement firm capabilities in the process of developing firm-specific advantages. The role of regulations as a factor that drives increases and decreases in the number of firms in an industry is unexplored. It would be of benefit to test the nature of firms' responses to regulations over longer time periods.
	Smith & Grimm (1987) *Strategic Management Journal*	US railroad industry Firms that adapt their strategies when regulations change are more successful. The firms that made strategic changes involving innovation and contingency showed better performance than their peers.	
Integration in operations	Brusoni et al. (2001) *Administrative Science Quarterly*	Aircraft engine control systems Customer requirements arising from regulatory change influence products and processes. The response to these requirements is to be involved in both component and architectural innovations.	**Focus on individual firms:** No firm-specific evidence presented and no comparison of different firms. No study of firms' implementation of new requirements arising from regulations. **Call for further research:** Need for increased understanding of how firms relate to regulators and manage the changes arising from regulations. How regulations influence vertical specialization is a promising area of research. Future research should explore how the role of firms in an integrated system changes as a result of regulatory change.
	Cacciatori & Jacobides (2005) *Organization Studies*	UK building industry Regulatory change influences competitive conditions by removing privileges for certain actors. Such changes alter the patterns of integration between firms, associated quality certification processes and customers.	
	Hobday et al. (2005) *Industrial and Corporate Change*	Military equipment industry Regulations and regulators are important actors in an integrated system. They can influence the level of integration as well as the conditions for integrating.	
	Jacobides (2005) *Academy of Management Review*	US mortgage banking industry Regulatory change influences products, processes and interfaces. Regulators can influence conditions for integration through investments in infrastructure for products and processes.	

Management task	Publication (authors and journal)	Empirical setting: Observations of regulatory change and the implementation of new requirements	Summary of conclusions leading to the identification of a research gap, purpose and research question for this thesis
	Jacobides & Winter (2005) *Strategic Management Journal*	US mortgage banking and Swiss watches Regulatory change "unbundles" industries. Access to information and associated processing activities are modified by such changes.	
	Pisano & Teece (2007) *California Management Review*	Various industries Efforts to shape rules within industries involve interaction with regulators. Regulators can have effect on implementation of products, processes and technology.	
	Tee & Gawer (2009) *European Management Review*	Mobile Internet in Japan and the Netherlands The regulatory environment influences success of business entry. It is very difficult for a single actor to predict or define the architecture of the industry after a regulatory change.	

business, and they risk being losers if they do not realize this potential (Levitt, 1968). Therefore, it is important to explore what firms can do to better manage new regulatory requirements. I will carry out this exploration by investigating multiple cases of firms that have taken implementation actions in the wake of a regulatory change. Such an investigation was recommended by Jacobides (2005, p. 465 note 1): "Focusing on activities—the tasks that need to be taken care of—provides an efficient way of examining how firm and industry boundaries change and how these changes create different types of 'institutional packages' along some or all of the activities (or 'steps') of the value chain that are undertaken in a sector." To identify potential differences, the actions of multiple firms will be investigated.

Very few academic or practical studies have provided any information on what firms do to manage new requirements from regulatory change.[4] The knowledge gap is well summarized by Jacobides & Winter (2010, p. 65) in their study of the "survival of the reckless" in the US mortgage banking industry following regulatory changes: "We might want to know a thing or two about how organizations and institutions actually do evolve." Indeed, we can gain new insight into firms' behaviour by investigating the implementation actions that they take in response to a specific regulatory change.

One implication derived from existing research on regulatory change is the decision to treat the change as an exogenous factor, even though in reality firms might be involved in the process leading up to the change (through lobbying and other influencing activities). This theoretical approach builds on previous studies that treated regulation as an exogenous force (Tee & Gawer, 2009; Ferraro & Gurses, 2009). As a result, I do not explicitly study the actions of firms before the change, such as their lobbying efforts (e.g. Jacobides et al., 2006). The main identified research gap involves what firms do to manage the implementation of new requirements after a change has been introduced.

[4] Most practical recommendations give specific compliance instructions, but do not answer the question of how to manage the impact of regulatory change in general terms.

Existing research neither predict nor proposes what firms will or should do to manage regulatory change. Understanding these actions is of high importance since they have great relevance for business practitioners and since regulations pose complex challenges. Deeper understanding is particularly needed on how firms evolve in connection with regulatory change and what separates one firm from another in managing the implementation of new requirements with success (Jacobides et al., 2006).

1.7 THESIS PURPOSE AND RESEARCH QUESTION

Firms need to understand how to adapt to and take advantage of exogenous changes such as regulations (Teece, 1986, 2006). Regulatory change is a key factor impacting industries, firms' relative positions with an industry, and corresponding relationships. Therefore, better insight into what firms do to manage regulatory change can result in new insight into the destiny of firms. The purpose of this thesis is to increase the understanding of how firms respond to external changes from regulations that impact their business operations, and how these responses influence firm positions and the arrangements between them. This purpose will be achieved by investigating firms' actions relative to the management of regulatory changes.

The study's primary research question is as follows (Figure 1): What do firms do to manage new requirements from regulatory changes? To answer this question, my empirical study of businesses will focus on what actions they took to implement new requirements. In addition, a complementary, comparative research question is posed: What are the differences between firms with more and less success in the market after the regulatory change? Contrasting more and less successful cases is a research approach applied previously to understand the evolution of firms and industries on various dimensions, including the impact of regulations (see Tee & Gawer, 2009 for an illustrative example). The question assumes that success in the market after a change is related to a firm's ability to manage the new requirements arising from the regulatory change.

Figure 1. Overall research question with an independent variable (new requirements from regulatory change) and a dependent variable (firm actions to implement)

From an analytical perspective, we can view regulatory change as the independent variable and firms' responses to manage and implement the change as the dependent variable. A regulatory change will be identified as a well-defined industry event. As a consequence of the regulatory change, the firm can take action to implement the corresponding requirements (rather than ignoring or avoiding the change). These actions will be described based on a theoretical framework suitable for interpreting firms' operational behaviours. One field that is well suited to offer a foundation for such investigations is innovation studies (Fagerberg, Fosaas & Sapprasert, 2012). This field has spawned seminal works in which regulations are addressed as a central influencer of industries and firms (e.g. Nelson & Winter, 1982; Penrose, 1959; Williamson, 1985), the role of regulations in the adoption and implementation of innovation (Rogers, 2010) and links to studies related to regulations and technology (e.g. Anderson & Tushman, 1990; Teece, 1986). The literature[5] will be analysed to determine the relevant dimensions to consider when designing a study of firms' responses to the impact of regulatory change and the differences between them.

Qualitative data will be collected from historical and retrospective case studies, as described below in the chapter on research methodology. The empirical data will be presented in two steps: (1) a contextual overview of the industry and its history, as background for understanding the industry and the participating firms, and (2) detailed case data related to one specific

[5] A comprehensive description of the field of innovation studies is presented in Fagerberg et al. (2012).

regulatory change. The data will be analysed for six firms. The results will then be discussed towards a response to the research question and related to the initial problem. Concluding observations will include contributions to theory as well as implications for practicing managers and policymakers.

2. THEORETICAL FRAMEWORK

In this chapter, I develop a theoretical framework that will be used to collect, interpret and analyse data on how different firms take action to implement new requirements. The starting point for deriving the framework is theory from innovation studies (Fagerberg et al., 2012), with an extended focus on research concerning integration in operations (Jacobides & Winter, 2005; Jacobides, 2005). The selection of theory is based on the three management tasks identified in the framing of the research problem: understanding industry dynamics, considering a firm's position and integration in operations. Theory from innovation studies is appropriate to answer the research question defined in the previous chapter through investigating firms' actions in the context of regulatory change. Studies of innovation and operations are intimately related (Alegre-Vidal, Lapiedra-Alcamı & Chiva-Gómez, 2004), and operations constitute a fundamental source of innovation actions (Giesen, Berman, Bell & Blitz, 2007). Also, innovations need to be implemented in practice in order to function (Schumpeter, 1934). Thus, innovation theory is a relevant starting point for addressing what firms do to manage new requirements arising from regulatory change, a question that requires looking at how tasks are performed in different parts of a firm's operations (Drejer, Blackmon & Voss, 2000; Voss, 2009).

The development of the framework starts with an overview of evidence related to the impact of regulatory changes on operations. A second step is to determine and describe the specific impacts on operations and the corresponding actions to implement new requirements. This review identifies two key dimensions (degree of integration between new and existing products, processes and technology, and use of external versus internal providers) for the framework. The dimensions are then further elucidated to sharpen the focus for collecting and interpreting the empirical

data. In each dimension, two possibilities are defined, resulting in four potential actions that can be selected to manage new regulatory requirements. Finally, the framework is related to the research question, to demonstrate its appropriateness for studying the problem as defined in chapter 1.

2.1 THE IMPACT ON OPERATIONS FROM REGULATORY CHANGE

Actions in connection with regulations and regulatory change are visible in studies that investigate how the operations of firms are impacted. This impact can alter the focus of attention of a firm's or business operations (Teece, 1986) by inducing significant modifications to products, processes and technology (Dosi, 1982). A regulation-driven change in focus can result in a paradigm shift by directing development efforts in new ways. As a consequence, new regulations can affect the structure of entire industries (Ansari & Krop, 2012). How firms decide to act during these circumstances can influence their future, as well as that of all firms in an industry (De Smet, 2012). The evolution of regulations can prevent firms from implementing products and services as intended (Penrose, 1959). How firms implement requirements in connection with a regulatory change can influence their ability to defend their position relative to customers and regulators (Ferraro & Gurses, 2009). The firms' relevant abilities are related not only to protecting ideas for products and processes, but also to how ownership of assets can result in advantageous positions as the industry changes over time due to the impact of the new regulations (Jacobides et al., 2006).

A study of the development of Internet-based telephone communications (such as Voice over Internet Protocol) showed how regulatory actions divided the market into several new segments (Ansari & Krop, 2012). The impact of regulatory requirements on the integration of technology can limit firms' options as to how they address a market. This case shows the importance of understanding how regulatory change can influence the conditions for integration between new and existing products,

processes and technology, including the availability of products across different distribution channels (Ansari & Krop, 2012).

The bundling of products and services could attract the interest of regulators where integration is too tight between products, processes and technology. Events of this nature have been observed with regard to mobile phones and associated product and technology platforms as multiple technologies converged (Kenney & Pon, 2011). As a result, firms needed to integrate efforts to position themselves in the industry with decisions on how to combine new and existing products and processes (Kenney & Pon, 2011). Also, the relationships to other providers within a system (Cusumano, 2010) determine how firms respond to changes in regulations (Kenney & Pon, 2011).

Regulations and regulatory change are of central importance to the financial services industry. One example can be found in firms' reactions to the introduction of UCITS (Undertakings in Collective Investments in Transferrable Securities) regulation of the investment fund industry, implemented in Luxembourg (De Smet, 2012). The firms in this industry managed to establish trust in their relationships with regulators. The implementation of the new regulation resulted in the emergence of new products and processes in the market and in changed positions for the firms that implemented the regulation (De Smet, 2012). This study showed the value of considering how the new products and processes relate to the existing offerings available to customers.

2.2 IMPACT ON PRODUCTS, PROCESSES AND TECHNOLOGY

Regulatory changes impact operations as a result of the associated implementation of new requirements. Impact has previously been noted in such areas as internal research (Nelson, 1959; Pisano, 1990), product development (Brown & Eisenhardt, 1995), customer and user requirements (Oliveira & Von Hippel, 2011) and evolution in technology (Anderson & Tushman, 1990). Internal research and development activities can look to regulations and changes in regulations for guidance and evaluation of new

solutions (Nelson & Winter, 1982). The influence of regulations in product development can create significant changes in the allocation of inventive efforts to meet market requirements (Abernathy & Clark, 1985; Ethriaj, 2007). The role of customers and users in the market is also modified when regulations change, since their requirements might be updated (Brusoni et al., 2001). Firms translate these requirements and integrate them into product and process offerings (Richard & Devinney, 2005). The products and processes offered to comply with new regulations can be supported by common technologies (Meyer & Dalal, 2002). The processes of integration and evolution in technology may be influenced by regulatory changes in the form of standards (Anderson & Tushman, 1990), which regulators themselves can induce by sponsoring the development of market infrastructure (Jacobides, 2005), leading to a different status and role of technology platforms in the market (Tee & Gawer, 2009).

The research literature in innovation studies suggests that the impact of regulatory change should be examined in three dimensions: products, processes and technology.

2.2.1 IMPACT ON PRODUCTS

Regulatory changes frequently target products offered by firms. For example, the new California rules for zero-emission vehicles motivated the creation of entirely new products (Dyerson & Pilkington, 2000). These new regulations established disruptive requirements since they could not be met with existing products and technology (Pilkington & Dyerson, 2004). They forced existing firms to establish new initiatives to develop new solutions and created an opening for entirely new firms to enter the market (Dyerson & Pilkington, 2000). For existing firms, an increase in environmental complexity compelled new decisions (Pilkington & Dyerson, 2004). New firms entering the market could be providers of technology to the existing firms. Moreover, the need to consider integration between the new and existing products was introduced.

Products are designed to define firms' offerings to the market and customers (Fixson & Park, 2008). In some cases, regulations facilitate better

understanding of products by demanding transparency with regard to product content (Richard & Devinney, 2005). By requiring increased transparency, a regulator can drive the demand for the unbundling of products into smaller parts (Funk, 2015). As a consequence, regulatory requirements can be integrated into products as a part of solutions for a firm's customers (Richard & Devinney, 2005). Therefore, firms need to understand how changes in regulations influence their existing products (Abernathy & Clark, 1985). Customers might voice demands for changes to existing products because they have been influenced by new regulations, so that the task ends up being passed along to the firm providing the products (Brusoni et al., 2001). Products could be used as vehicles in this alignment to introduce common approaches to compliance when applying regulatory changes (Meyer & Dalal, 2002). On the other hand, the use of common products in different markets can be discouraged by regulatory differences between markets (Karlsson & Sköld, 2007; Tee & Gawer, 2009). Therefore, one possible impact of new regulations is that products will *not* change although their markets may become more limited (Jacobides, 2005).

The television industry, and in particular the US pay-TV segment, shows a pattern in which new actors have attempted to enter a market by aligning their proposition with regulatory change (Gurses & Ozcan, 2014). The evolution in this industry shows that new and innovative products and services can reach a market despite strong resistance from existing actors, including regulators who might apply regulations to the disadvantage of the new entrants (Gurses & Ozcan, 2014). New products and services introduced better be related to the existing offerings on the market to appeal to regulators, and integrative processes towards external providers are also involved (Gurses & Ozcan, 2014).

The evolution of regulations was shown to influence the relative success of new products and services in the mobile Internet industry. An empirical study conducted in two countries demonstrated that the outcomes differed in each market depending on the regulatory situation (Tee & Gawer, 2009). This study also showed that the application of complementary products and processes could establish a firm in a favourable position when regulations change the organization of an industry. A viable business model in the

context of changed regulations also takes into account the benefits for other eco-system participants (Tee & Gawer, 2009). Hence, the understanding of how to integrate both new and existing products as well as internal and external assets is central.

Regardless of the level of change imposed by a new regulation, firms need to be aware of that the delivery of products requires a multitude of inputs, all of which might be subject to influence (Pisano & Teece, 2007). These requirements may also influence processes related to the manufacturing, assembly and service of new and existing products (Meyer & Dalal, 2002).

2.2.2 IMPACT ON PROCESSES

The delivery of products to the market, along with their corresponding use by customers, is related to the execution of a range of processes to bring the product to market across a distribution network and then to serve the customers over the life cycle of a relationship (Teece, 1986; Pisano & Teece, 2007; Jacobides, 2005). Processes can be classified as production and distribution (Dietl, Royer & Stratmann, 2009), sales and services (Tripsas, 1997), or distribution and services (Teece, 1986, 2006). A regulatory change influences the process of manufacturing a product, leading to improvements in cost or quality (Anderson & Tushman, 1990). The evaluation of such criteria in the distribution process is also subject to changes due to the introduction of new regulations (Cacciatori & Jacobides, 2005). As a consequence, the processes by which firms distribute their products to their clients can change (Dietl et al., 2009). Associated templates for the execution of service and distribution processes are influenced by regulations as well (Jacobides, 2005). Firms may apply external regulations and standards as guidelines to modify their own internal processes (Cabigiosu & Camuffo, 2012). These processes can include addressing regulatory compliance and are sometimes integrated into customer offerings to expand the role of firms (Richard & Devinney, 2005). In this way, common regulatory processes can be leveraged across different products and services (Meyer & Dalal, 2002).

In a study of the US radio broadcasting industry during the 20th century, the actions of regulators were found to have significant influence on innovation and operations (Funk, 2015). These actions prompted new products and processes as well as the entry and exit of specific firms into and out of the industry. Changes took place in the interactions between different layers of the industry, and between firms within those layers, placing demands on businesses' ability to integrate. Regulatory change also significantly reduced the cost of the distribution processes, which modified the structure of the value chain (Funk, 2015). This study illustrated how regulatory changes affected firms' overall positions within an industry as well as the importance of relationships with external providers. Also, it suggested that the relationship between newly introduced and existing products and processes should be considered.

The interface between regulators and financial actors has been highlighted in the US mortgage banking industry, where changes evolved partly as a result of regulatory change (Jacobides, 2005). Changes impacted the structure of products by allowing "securitization", thus permitting firms to offer new solutions to the market. As a consequence, the interfaces concerning vertical integration between industry participants were influenced, since "regulation tends to either institute or legitimize new rules, such as vertically cospecialized arrangements" (Jacobides, 2005, p. 487). Fresh options to combine new and existing processes or to utilize external providers as contributors to the business were made possible (Jacobides, 2005).

2.2.3 IMPACT ON TECHNOLOGY

Regulatory changes related to either products or processes can rely on technology modifications to meet new requirements (Abernathy & Clark, 1985). Technology is subject to change when regulations change because the incoming regime defines new technological interfaces (Jacobides et al., 2006). Technology itself can be the force driving regulatory change by mandating new definitions of technology (Ansari & Krop, 2012). Updated technology can thereby serve as a complementary change force that co-

exists with regulations and results in new distribution of roles and tasks in an industry (Ferraro & Gurses, 2009). Regulatory change can also influence the availability of technology, e.g. in the form of expired legal protections (Richard & Devinney, 2005) or through the adoption of standards (Anderson & Tushman, 1990; Tee & Gawer, 2009). Regulators sometimes introduce certifications for new technologies to bring them to the market's attention (Teece, 1986). In fact, regulatory intervention is sometimes required to bring new technologies into existence (Teece, 2006), particularly where disruptive regulators aim to change the use of technologies (Pilkington & Dyerson 2004, 2006). On the other hand, stricter regulations can hinder the evolution of new technology (Wouters, Workum & Hissel, 2011), as can the perception that a new technology runs counter to existing or new regulations (Gurses & Ozcan, 2014). The influences of regulations on technology and on corresponding products and processes function as a cognitive lens guiding businesses' consideration of external or internal providers and their use of existing or new solutions when implementing new regulatory requirements (Kaplan & Tripsas, 2008).

2.2.4 THE IMPLEMENTATION OF CHANGES IN PRODUCTS, PROCESSES AND TECHNOLOGY

The types of impacts on operations depicted above will provide the basis for decisions as to whether internal sources or external providers are used to respond to new regulatory requirements (Salvador et al., 2002). Implementation may involve the use of both internal and external providers as well as understanding how to integrate existing and new products, processes and technology (Pisano & Teece, 2007). The task of integration entails challenges in managing the relationship between new and existing components of a product or process (Henderson & Clark, 1990). The firm must be able to master different integration arrangements, as such arrangements can change when regulations change (Jacobides, 2005). The possibilities of obtaining products, processes and technology from external sources are also influenced by regulatory requirements that may differ between industries (Jaspers et al., 2012). In the end, regulatory changes and

advances in technology towards a more flexible design of products and processes often enable new divisions of tasks between firms (Baldwin & Clark, 1997). The consequences can involve either further integration or further disintegration (Hobday et al., 2005).

The studies reviewed in Table 2 have been identified as the relevant research observations in which the two topics of regulatory change and operational implementation were treated in the same setting. The findings come from previous research that has indicated conclusions concerning what firms do to manage new requirements arising from regulatory change. The observations are summarized in the table, which also describes the empirical setting of each study and the actions taken in response to the new regulatory requirements. This information will be used as input for building the present study's theoretical framework.

The review of studies that examined the impact of regulations on firm operations leads to two conclusions.[6] First, as already noted above, three areas of impact should be considered: products, processes and technology. Second, the implementation of new requirements arising from regulatory change should consider the use of internal and external providers as well as the integration of new and existing products, processes and technology. The findings of these studies thus identify the key dimensions to be articulated in a framework appropriate for studying the actions taken by businesses in response to regulatory change.

To implement new requirements from regulatory change, a firm needs to decide how to integrate external and internal providers (Brusoni et al., 2009). These providers' roles may change when interfaces are modified due to regulatory change (Jacobides & Winter, 2005). The unbundling of products and processes can lead to changes in industry structure (Langlois & Robertson, 1992). In this process, choices are to be made between the acquisition of bundles and the assembly of separate components from multiple providers (Schilling, 2000). Regulatory changes play a role in the evolution of the complex systems in which multiple providers are integrated

[6] The content was analysed by identifying the main concepts in each article. A detailed grouping of the key concepts from the listed articles and how they lead to my conclusions is presented in Appendix A.

Table 2. Research literature used to assess areas of impact and implementation resulting from regulatory change

Study	**Empirical setting and research design**	**Empirical observations on implementation of new requirements arising from regulatory change (input for building the theoretical framework)**
Ansari & Krop (2012)	Dutch television industry Primary data from the industry level and archival data from four episodes of disruptive innovations	Changes in regulations influence the division of industries. These changes can create new markets for challengers and associated new products, processes and technology. Firms need to understand how these changes create new operational requirements. Regulatory frameworks can lower the innovative activities due to the ”ring-fencing” of an industry (i.e., protection from outside competition). A change in regulations can create a need to collaborate with external providers.
Brusoni & Prencipe (2001)	Aircraft engines and chemical plants Two detailed case studies	The number of components in a product or process can be influenced by cumulative changes in regulations. Firms need to understand and implement the requirements of customers related to responses to regulatory change. This can be done either in existing products or by creating new products.
Cabigiosu & Camuffo (2012)	The air conditioning industry Analysis of the product and organizational architectures of three firms through an original dataset of 100 components and supply relationships	Regulatory standards influence the availability of components in collaborations between firms. Producers of components use standards (regulations) to define the production process and/or component quality. A change in such regulations will influence existing products or processes and potentially create the need for new ones.
Chen & Liu (2005)	Taiwan’s machine tool industry Case studies to examine the practical application of interface strategies	The regulatory force of rigid external interface requirements constrains firms’ innovation activities. The innovative organization tends to encourage development of advanced, innovative ideas over following existing regulations. Changed regulations will influence interfaces between the firm and external providers as well as between existing and new products.
DeSmet (2012)	Fund management industry in Luxemburg Case study research including several semi-structured interviews of leading professionals, professional associations and representatives of the public sector	Regulations are a tool that public authorities can use to impose new requirements on business. When actors in an industry address a regulatory change, benefits are achieved for that entire industry through the creation of new products and processes. Often, regulations are perceived as a constraint since they preserve existing standards or established practices. On the other hand, modifications in the regulatory framework are one of the main drivers of change in the financial services industry.
Dyerson & Pilkington (2000)	California regulation on electric vehicles Industry-level case study of the adoption of a technology	Regulatory change creates demand for more efficient products. This demand can force the introduction of new technologies. Such technologies might need new sources to provide them, and links to existing technologies should be considered.

Study	Empirical setting and research design	Empirical observations on implementation of new requirements arising from regulatory change (input for building the theoretical framework)
Funk (2014)	US broadcasting industry An historical study using archival data	Regulatory change can create entrepreneurial opportunity. Roles for packaging emerge in these processes. The packaging process entails a need to engage with external providers, and links between new and existing products, processes and technology need to be addressed.
Gurses & Ozcan (2014)	US television industry An historical study of two cases of new technology introduction	Regulations can either enable or hinder innovative activities by firms. The process of implementing regulatory requirements involves interaction with regulators as well as with external providers. The new products and technologies introduced need to relate to existing market offerings.
Jacobides (2005)	US mortgage banking industry Case study of the industry including archival data and interviews	Regulatory change influences products and processes as well as the integration arrangements between actors in an industry. Regulators can be responsible for establishing platforms and infrastructures for interaction between providers of products and processes.
Jaspers et al. (2012)	Banking and telecommunications collaboration on mobile banking Case study of one alliance between two firms in different industries	Regulations influence the possibilities for collaboration around innovation. Such influences are due to the different perceptions that firms have regarding the implications of regulatory frameworks for the interfaces between the firms.
Karlsson & Sköld (2007)	Industrial products A longitudinal field study using a clinical research approach in a global multi-product, multi-branded industrial group	The roles of different regulatory requirements impact the implementation and use of common architectures and platforms for products and processes. Insight is needed on how new solutions can relate to existing market offerings.
Kenney & Pon (2011)	Smartphone industry Detailed analysis of the actions and strategies of four major competitors, including Apple, Google, Microsoft, and Nokia, and (more briefly) Research in Motion and HP/Palm.	Development of standards might create interest from regulators to introduce anti-trust rules. An increased focus from regulators can therefore limit the possible combinations of products, processes and technology, since the options for integrating new and existing solutions are hindered.

Study	Empirical setting and research design	Empirical observations on implementation of new requirements arising from regulatory change (input for building the theoretical framework)
Meyer & Dalal (2002)	Materials manufacturing Ten years of engineering and manufacturing cost data and allocation of these data to successive platforms and products, with generation of R&D performance measures	Firms can leverage common regulatory compliance processes across different processing services and product lines. Any such arrangement needs to involve integration of new and existing products and processes.
Pilkington & Dyerson (2004)	California zero-emission vehicles Overall study of the industry	Disruptive effects can come from regulators and regulatory change. These effects mandate innovative responses from firms, which may involve the use of new providers of technology.
Salvador et al. (2002)	Durable goods industries Industry case study	Regulatory change presents an opportunity to expand products and processes across different markets, but at the same time constraints are introduced to comply with local variations in regulation. Customer requirements may evolve as a result of changes in regulations, and such requirements may result in the need for new sourcing arrangements.
Tee & Gawer (2009)	Mobile telephone and Internet in Japan and the Netherlands Case study of the development of the industry in two countries	The regulatory environment influences success in business entry. Changes in regulations lead to results that are difficult to predict for individual actors. Hence, a new technology must be related to existing offerings in the market.

and in the accompanying need to manage interfaces between new and existing products, processes and technology as well as between providers (Hobday et al., 2005). Firms are exposed to a variety of challenges as they move from grasping the impact of a regulatory change on operations to the corresponding implementation of the requirements. The complication associated with implementations is due to that "changing regulatory requirements are creating a derived, albeit uncertain, demand" (Pilkington & Dyerson, 2004, p. 344).

2.3 ACTIONS TO IMPLEMENT NEW REQUIREMENTS ARISING FROM REGULATORY CHANGE

The requirements derived from new regulations are implemented in products (Chen & Liu, 2005; Fixson & Park, 2008), processes (Jacobides, 2005; Meyer & Dalal, 2002) and technologies (Pisano & Teece, 2007; Teece, 1986). Therefore, the implementation of new regulatory requirements impacts the entire approach to product development (Wouters et al., 2011). One corresponding response is to reassess decisions across the supply chain involving external providers (Salvador et al., 2002). These requirements involve actions concerning both relationships with external providers and the business's internal technological focus (Tee & Gawer, 2009). Hence, changes are possible both within the firm and across the boundaries between different firms (Baldwin, 2008). This evolution can result in the creation of new products and processes as well as new ways of sharing tasks in an industry (Jacobides & Winter, 2010).

This wide-ranging impact of regulatory change involves various organizational units within the firm and calls for various types of implementation resources (Jaspers et al., 2012), along with assessing the different demands from customers across multiple market segments (Karlsson & Sköld, 2007). The new requirements necessitate integration across existing and new products and processes (Jacobides, 2005). The changed regulation might result in new ways to conduct business within the firm and in constellations with other firms (Ferraro & Gurses, 2009). Any approach to implementing a regulatory change should therefore consider the

role of interfaces (Chen & Liu, 2005), and this consideration impacts all participating firms and the units within those firms (Jaspers et al., 2012).

The influence of conditions and complexity of the phenomenon make it difficult to manage the implementation of new regulatory requirements. If management's starting point is a negative view of the regulations (Levitt, 1968), then it might seek to avoid rather than embrace and implement them (Funk & Hirschman, 2014). In addition, it is difficult for each individual firm to oversee the operational consequences of a regulatory change (Jacobides & Winter, 2010). As a result, consequences ensue in a way that no individual firm can predict (Tee & Gawer, 2009). The impact of the implementation of new requirements due to changes in regulations is also difficult to assess (Zwerink, Wouters & Hissel, 2007). The implementation of new products, processes and corresponding technologies is influenced by the availability of resources due to interface requirements (Chen & Liu, 2005). Despite these difficulties, there are ways for firms to carry out implementation in an effective manner (De Smet, 2012).

Based on the review of the research literature, a two-dimensional framework is proposed to incorporate existing understanding of the actions that firms take as a result of regulatory change. The first dimension is the level of integration of new and existing products, processes and technologies. A deeper understanding of the role of integration in the context of regulatory change is required since the new products, processes and technology created in response are related to the existing business (Abernathy & Clark, 1985). The second dimension of the framework concerns the choices between external and internal providers. This dimension contributes to the framework because regulations influence both the providers of products, processes and technology and how firms relate to each other (Ferraro & Gurses, 2009).

The impact on operations identified for products, processes and technology will be examined across both dimensions of the model so as to grasp and interpret firms' actions when regulations change. The approach is supported by the importance of combining different sources when defining technological innovation (Abernathy & Clark, 1985), categorizing product innovation into different types given these different sources (Henderson &

Clark, 1990) and understanding processes in complex systems (Hobday et al., 2005). I operationalize each dimension in terms of two options, low or high, resulting in four possible approaches to managing the implementation of new requirements (Figure 2). This simplified analytical structure is designed to facilitate identification of similarities and differences between firms' actions. The use of this framework across firms will enable me to locate and categorize their actions in both dimensions with regard to the impact of regulatory change on products, processes and technology.

To explain the model more fully, I will next discuss the two dimensions in detail. The model is thereby proposed as a tool for collecting and analysing data on the implementation of new requirements when regulations change. Finally, the model will be related to the research question, completing the establishment of the framework for this study.

	Integration of New and Existing Products, Processes, Technology	
Use of External Providers of Products, Processes, Technology	Low	High
High		
Low		

Figure 2. Theoretical framework dimensions, choices and actions

2.4 INTEGRATION OF EXISTING AND NEW PRODUCTS, PROCESSES AND TECHNOLOGY

To clarify this dimension of the framework, I will first articulate differences in nature between existing and new products, processes and technology. After that, the decision whether to pursue high or low integration is explained.

When regulations change, new requirements surface from the market and customers (Jacobides & Winter, 2005). Therefore, new approaches are required to facilitate the design of new products and services (Pisano & Teece, 2007). These new requirements might also relate to the existing business (Jacobides & Winter, 2005), and the firm needs to decide how to translate these requirements into its complete set of offerings (Brusoni et al., 2001). Such decisions include relating new and existing products, processes and technology (Pisano & Teece, 2007), and they also encompass whether the new and existing products will be treated as integrated or stand alone in a portfolio management context (Karlsson & Sköld, 2007). Changes in regulations and the need to interpret these changes for customers can lead to increased complexity in the balancing of existing and new products (Brusoni & Prencipe, 2001). A regulatory change can also give rise to new processes, since processes evolve in response to the regulations, altering the way in which activities are integrated (Jacobides, 2005; Jacobides & Winter, 2005).

2.4.1 EXISTING PRODUCTS, PROCESSES AND TECHNOLOGY

The use of existing products, processes and technology can be compared to incremental innovation (Henderson & Clark, 1990). Existing components have well-established links and function within a defined architecture (Fixson & Park, 2008). International and national regulations in the form of standards define the quality of existing products, processes and technology (Cabigiosu & Camuffo, 2012). The evolution of regulations implemented as standards can generate dominant designs that favour the use of existing items (Anderson & Tushman, 1990). Moreover, the regulatory force of rigid interface requirements might constrain the introduction of new sources of

supply (Chen & Liu, 2005). On the other hand, firms that include regulatory support in the existing products and processes offered to clients can take on additional roles in the value chain (Richard & Devinney 2005). In this way, regulatory compliance processes can be applied across multiple existing businesses with the support of platforms (Meyer & Dalal, 2002). The rewards derived from such product differentiation can be influenced by the introduction of regulations (Teece, 1986). For this reason, the suitability of existing products related to newly enacted regulations are required to be understood (Jacobides & Winter, 2005).

The way in which products are produced and how customers relate to these products is affected by the regulations imposed on industries (Abernathy & Clark, 1985). Existing product strategies could be adjusted in response to regulatory threats such as actual or impending anti-trust lawsuits (Kenney & Pon, 2011). A regulatory change can result in the establishment of processes that require separate business logics from those that characterize existing processes (Jacobides, 2005). On the other hand, the tasks of addressing a regulatory change need support from existing complementary processes (Pisano & Teece, 2007). Existing processes can be split up to serve different and separate markets due to the action of regulators (Ansari & Krop, 2012). As a result, regulatory changes can reduce the cost of distribution processes, which opens up opportunities for new products, processes and technology to be introduced (Funk, 2015).

2.4.2 NEW PRODUCTS, PROCESSES AND TECHNOLOGY

Discontinuities in product form and quality can derive from the actions of regulatory agencies (Anderson & Tushman, 1990). The introduction of the new can take place within the existing structure of an offering to the market (Abernathy & Clark, 1985). Alternatively, a product can be defined in new ways, changing the way in which it is developed (Anderson & Tushman, 1990). New development triggered by regulators creates opportunities for owners of new assets to perform implementation of the new requirements (Ferraro & Gurses, 2009). To use these assets effectively in the development and introduction of new products presumes the capability to perform

system integration in which different requirements are understood and linked (Brusoni et al., 2001). The assets become valuable because the regulatory changes present the need for new processes that are difficult to assess (Zwerink et al., 2007). Complexity in integration tasks can increase due to strict regulations (e.g. ensuring safety in the medical industry) that increase the time required to introduce new products and technologies (Wouters et al., 2011). The complexity of integration can also be driven by an increase in the number of requisite components due to changes in regulations (Brusoni & Prencipe, 2001). The introduction of new concepts due to changes in regulations and standards can be difficult for decision makers to foresee (Zwerink et al., 2007), since the force of regulations might make it necessary to adopt new design concepts (Mikkola, 2006). Regulations thereby influence the setup of new products and platforms (Chen & Liu, 2005).

Regulations can influence the need to balance a specialized against a generic tailoring and packaging approach to products (Salvador et al., 2002). Certain regulatory changes will trigger the fine-tuning of products to new requirements based on specific customer demands (Brusoni et al., 2001). A specialized approach can involve the inclusion of regulatory requirements in product offerings (Richard & Devinney, 2005). A more generic approach might be supported by the application of a product platform (Meyer & Dalal, 2002), but this approach may be problematic because of the different requirements of customers in different markets (Karlsson & Sköld, 2007) and the established structure of the industry in a particular country (Tee & Gawer, 2009). The evolution of regulations and the need for the firm to translate customer requirements for products can result in an increasing number of new products and processes (Brusoni & Prencipe, 2001). Regulatory change can drive the need for customization of products (Brusoni & Prencipe, 2001; Salvador et al., 2002), but at other times it can exert pressure towards consolidation and similarity of offerings across markets and customer groups (Salvador et al., 2002).

2.4.3 HIGH INTEGRATION

Product and information standardization provided by regulators can enable strong links between new and existing products and processes (Jacobides, 2005). Dynamic changes in regulations will influence the structure of an industry, and as a result they can generate momentum for integration between products across platforms (Tee & Gawer, 2009). In such platforms, different products (such as financial services covering mutual funds and those concerned with private and public pension funds) can use the same integrated regulatory compliance processes (Meyer & Dalal, 2002). Firms can leverage this advantage by considering the packaging of changed regulations as an addition to existing market offerings (Richard & Devinney, 2005). Packaging of different products and services can be a useful way to approach the implementation of new regulatory requirements (Ferraro & Gurses, 2009). Firms can benefit from managing the integration of their entire product and process range across a common platform (Karlsson & Sköld, 2007); this approach facilitates compliance because processes can be leveraged across product offerings (Meyer & Dalal, 2002). The integration of new regulatory requirements into existing products is often pursued to achieve operational advantages (Richard & Devinney, 2005). Regulations can also result in the launch of separately available offerings by market actors (Jacobides, 2005). The introduction of a new regulation can change the balance between use of existing and new products and processes (Anderson & Tushman, 1990). The linking of new products to existing offerings from incumbent firms as well as the interest of regulators could facilitate entry by new firms (Gurses & Ozcan, 2014). Links can be established when transactions can be defined and executed based on a regulatory framework (Baldwin, 2008). The establishment of links requires standards (which may themselves be contained in the regulatory change) for determining how such links function in the firm's operations (Baldwin & Clark, 1997).

2.4.4 LOW INTEGRATION

The nature of the integration provided by different firms can be limited by regulations (Jaspers et al., 2012). Such limitations might lead to an approach to keep the existing and the new separated selecting a low integration. New requirements can lead to uncertain demands on products and processes (Pilkington & Dyerson, 2004), and the potential to leverage the same products across different brands and markets can be hampered by the lack of knowledge about the new rules and regulations (Karlsson & Sköld, 2007). Legal factors defining the uniqueness of product components can lead to low levels of standardization, which also limits the combination of the existing and the new (Fixson & Park, 2008). Keeping the new and the existing separate can be preferable when there are different understandings of market requirements (Karlsson & Sköld, 2007). Despite the evolution towards common regulations, country- or region-specific regulatory changes and constraints must be considered as part of customizing products and services (Salvador et al., 2002).

A new set of requirements emerging from a regulatory change can also lead to radically new approaches to products and processes; in this case, a complete separation from existing products and processes may be desirable (Anderson & Tushman, 1990). Similarly, strong regulatory protection of a particular technology could suggest a benefit in retaining a clear separation (Teece, 1986). Without such protection, the new technology might fail (Teece, 1986). The actions of regulators can split a marketplace into several segments, distinguishing old from new products (Ansari & Krop, 2012). An example of such a marketplace is telephony covering Internet-based and traditional solutions (Ansari & Krop, 2012). Also, the practice of "ring-fencing" an industry by protecting it from external competition can incentivize the separation of the existing from the new (Ansari & Krop, 2012). Strict regulations can make development lead time longer and hence limit combinations, because the company is forced to maintain different time perspectives for the existing and new products, processes and technology, respectively (Wouters et al., 2011). Also, different production and distribution configurations can drive the separation between new and

existing products (Dietl et al., 2009). The varying evolution of regulations in different markets challenges the company's ability to link between existing and new products (Salvador et al., 2002).

2.5 EXTERNAL AND INTERNAL PROVIDERS

A firm can decide to use external or internal providers for products, processes and technology. A change in regulations might create a need for new building blocks (Anderson & Tushman, 1990). The technical requirements behind these products and services can also change as a result (Abernathy & Clark, 1985). At any time, the firm can decide to use internal or external providers of the emerging building blocks arising from regulatory requirements (Brusoni et al., 2001). This decision is related to the evolution of roles in the industry (Jacobides, 2005) and how the relative capabilities of firms evolve (Jacobides & Winter, 2005). The frame for such decisions can be hampered by regulatory changes that impose restrictions on collaboration (Jaspers et al., 2012). Changes in interfaces defined by regulatory frameworks alter the distribution of functions across a production process (Jacobides et al., 2006). The use of particular external partners may also be mandated by regulatory circumstances (Gulati & Singh, 1998). Changes in regulations can clarify the conditions required for firms to collaborate concerning products and processes (Jacobides, 2005).

Alterations in how to assemble products are not defined purely by technological factors, but also depend on the surrounding regulations and the firm's previous investments (Brusoni et al., 2009). The potential of sourcing from other industries can be influenced by regulatory changes (Jaspers et al., 2012). The role of participants in an eco-system as providers of products therefore differs depending on the structure of the industry, which includes its rules and regulations (Tee & Gawer, 2009). A regulatory change influences the arrangements established to produce products (Jacobides, 2005). Since the delivery of product innovation requires input beyond the internally available components (Pisano & Teece, 2007), regulations can influence businesses' consideration of whether to make or buy parts of their products (Jacobides & Winter, 2005). A regulatory change

can open up space for companies to take responsibility for different parts of a product (Baldwin & Clark, 1997). Such changes are applicable to both existing products and new development (Jacobides & Winter, 2005).

Regulatory changes may impact the division of a process configuration between internal and external providers (Jaspers et al., 2012), as they influence the available specifications of arrangements that constitute an offer to the market (Jacobides, 2005). These choices are one aspect of the arrangements concerning vertical integration (Jacobides & Winter, 2005). The delivery of an innovative process often requires the use of both internal and external partners (Pisano & Teece, 2007). The building of a complex process can benefit if delivery is broken up into smaller pieces provided by different actors (Baldwin & Clark, 1997). The actions of regulators paired with different (and changing) customer requirements can alter the arrangements between a fully internal model of sourcing and reliance on external providers (Salvador et al., 2002).

2.5.1 EXTERNAL PROVIDERS

The use of external providers can give a firm flexibility to handle changing customer requirements (Brusoni et al., 2001). The delivery of products and processes for such requirements is dependent on complements in the vertical chain of production (Pisano & Teece, 2007). On the other hand, such arrangements limit control over the products and processes, which can create issues related to following regulations (Jaspers et al., 2012). Actions by regulators can prompt the inclusion of external process providers, since a regulatory change may address the exclusivity of market access for firms that have mastered the entire delivery of products or processes (Cacciatori & Jacobides, 2005). Industry standards defined by regulations increase opportunities for the use of external providers, because regulations can form the basis for specifications that make it possible for different players to connect (Agrawal, 2009; Jacobides et al., 2006). Such connections can facilitate integration of external providers and make it easier to draw partners from different industry sectors (Jacobides & Winter, 2005). A potentially complicating factor is that an external provider might follow

different regulations, and such differences (across industries) might make the use of external providers more complex (Jaspers et al., 2012). When such circumstances introduce too much complexity the firm might decide that internal sources are a more viable option (Jaspers et al., 2012).

2.5.2 INTERNAL PROVIDERS

The use of internal providers means finding the source of products, processes and technology within the boundaries of the own firm's organization—a decision that could be seen as acting in a "transaction-free zone" (Baldwin, 2008, p. 157). Internal provision of products and processes is a more intrinsically integrated approach (Fixson & Park, 2008). Flexibility is thereby limited, and this limit can hamper firms' ability to manage adjustments in customer requirements due to regulatory change (Brusoni & Prencipe, 2001; Salvador et al., 2002). The perception that firms in particular industries have a special status could lead to a preference for internal and integrated delivery processes (Jacobides & Winter, 2005). Internal approaches are used when firms favour stability over innovation (Chen & Liu, 2005) and may also be prevalent in times of incremental innovation (Abernathy & Clark, 1985). In such periods, a lack of standardized information makes it more likely that companies will prefer internal provision of products and processes (Jacobides, 2005). Internal provision tends to prevail if information requirements cannot be partitioned into visible design rules facilitating exchanges between firms (Baldwin & Clark, 1997). Under such circumstances it can make sense to perform transactions within transaction-free zones, such as in a legally defined corporation (Baldwin, 2008). When internal bundling of products and services reaches a high level, this could arouse notice from regulators (Kenney & Pon, 2011). Changes in market demands might challenge existing combinations of providers and institute a process of reintegration, in which new and existing concepts need to be balanced (Cacciatori & Jacobides, 2005).

2.6 THE FRAMEWORK AS A TOOL TO ANSWER THE RESEARCH QUESTIONS

The four possible options defined by this framework for the implementation of new regulatory requirements are related to the research questions formulated in the introduction: (1) What do firms do to manage new requirements from regulatory changes? (2) What actions do firms take to implement the new requirements? and (3) What are the differences between firms with more and less success in the market after the regulatory change? In the illustration of the framework in Figure 2, each cell indicates a possible combination of actions.

The option of using internal providers and low integration with existing products, processes and technology carries the least risk of the four. This approach has limited impact on interfaces (Chen & Liu, 2005). Firms that put less focus on innovation tend to favour internal innovation sources that limit changes in interfaces (Chen & Liu, 2005). Uncertainty concerning differences in market requirements might increase the desire to pursue internal sources without integration (Karlsson & Sköld, 2007). This option is the most "stand-alone" response to regulatory change.

The use of external providers with low integration between existing and new products, processes or technology could be applied when there are differences in perception regarding the impact of regulatory changes (Jaspers et al., 2012). Firms could still achieve new offerings without challenging the complexities of integration and compliance with separate regulations (Salvador et al., 2002). Here, the external provider supports the regulatory change, but the resulting product, process or technology is not integrated with the existing business.

A mixed approach to regulatory change with respect to introducing complexity is to use internal providers and to apply integration between existing and new products, processes or technology. Provision from internal sources could limit the need to establish new standardization of information and specification of processes (Jacobides, 2005), since a "transaction-free zone" has been established within the firm (Baldwin, 2008). This option avoids potential problems that can arise where different actors have

different views of regulations (Jaspers et al., 2012). Co-existence of new and existing products, processes and technology might be facilitated by dominant designs (Anderson & Tushman, 1990).

When external providers are supplying new products, processes or technology that are integrated with the existing ones, the firm needs to address standardization of the information flowing between the organizations (Jacobides, 2005). Architectural capabilities are required to manage the integration of the external and new with the existing (Richard & Devinney, 2005). This need for management is also applied when integrating new service processes with existing processes (Richard & Devinney, 2005). This is the most complex of the four options, since both integration and use of external providers add complexity.

The different choices reflect different approaches to addressing the impact of regulatory change on operations, which can involve new ways of packaging and profit sharing related to assuming risk when regulations change (Ferraro & Gurses, 2009). These approaches lead to different actions in the implementation of new regulatory requirements. The actions are defined (and thereby simplified[7]) in the model as four different options to facilitate the process of detecting differences between the strategies of various firms in the empirical data.

2.7 CONCLUDING THE REVIEW OF THEORY

The picture of regulatory change and the implementation of new requirements show a complex pattern of impact. All actors in a system (including regulators) need to understand the system's developmental patterns (Hobday et al., 2005). To direct the present research towards generating relevant information, a theoretical framework has been developed for application to designing the study and carrying out analysis in a selected empirical setting. Examining the impact of a specific regulatory

[7] One obvious simplification is that limited attention is given to integration across the three impact areas of products, processes and technology. For instance, a new product could be integrated with an existing technology. Despite this simplification, the framework is expected to be appropriate for identifying key differences in actions among a set of case-study firms.

change will provide a historical and longitudinal perspective, and the actions of different firms will be identified and classified with the help of the framework. Several empirical studies of the impact of regulatory changes have approached a selected research setting using an historical method, relying on archival documents and sometimes complementing the historical data with personal interviews (Cacciatori & Jacobides, 2005; Ferraro & Gurses, 2009; Funk, 2015; Gurses & Ozcan, 2014; Jacobides, 2005). These studies provide a foundation for a viable methodological decision on what to study and how to study it in order to gain new insights on the actions taken by businesses in response to new regulations.

3. RESEARCH METHODOLOGY

This chapter on research methodology described the tradition of practitioner scholarship that has formed the basis of my doctoral studies and the research design used for collecting and analysing the data. I also reflect on the role of a collaborative researcher in bridging the gap between academic rigor and practical relevance.

3.1 INTRODUCTION

Understanding how firms respond to regulatory change requires reviewing their actions over a long period (Ferraro & Gurses, 2009). It takes time for changes in regulations to become fully incorporated into a firm's products and processes (Jacobides, 2005). My background has equipped me to approach this long-range review from complementary perspectives, as both an academic researcher and a business practitioner. This dual role has affected my decisions on research design and on how data have been collected, analysed and presented.

To ensure a manageable focus on the relevant actions taken by companies, I have limited the range of empirical case studies selected to one specific segment of the financial services industry. Observers of innovation patterns in this industry have noted, "we know little about how these new practices [adopted in response to regulatory change] changed the operation of institutions and individuals within the sector" (Jacobides & Winter, 2010, p. 2). Such a situation demands increased understanding and formulation of new theories (Voss, Tsikriktsis & Frohlich, 2002). Therefore, the research design implemented applies an historical method with qualitative case studies (Meredith, 1998, 2002). This approach has been central to my work as a PhD student.

3.2 RESEARCH TRADITION

As a PhD student, I have become thoroughly grounded in two research traditions: the methods used in research projects at the Centre for Innovation and Operations Management (CIOM) at the Stockholm School of Economics and those considered relevant at IBM (where I have been employed during my PhD studies).

One key feature of the research performed at CIOM is its tight connection to companies, derived from the belief that research results should have practical and managerial implications. The frequent use of case studies to collect and analyse data is reflected in this research. Case studies are presented in a wide array of industries and on various topics related to operations and innovation management (e.g. Åhlström, 1997; Axelson, 2008; Brattström, 2014; Richtnér, 2004; Sköld, 2007). The approach can be considered part of a broader Scandinavian tradition of research conducted through close access to empirical settings within companies (Drejer et al., 2000).

My employer, IBM, undertakes research activities in close connection with academic institutions. I have been inspired by three such projects. The first, on developing management leadership, has been executed by the Institute for Business Value. I have produced one report for this institute (Bieck & Freij, 2010), which has provided good preparation for my thesis work. The second is the work of IBM's research division in the area of Service Science Management and Engineering (Spohrer & Maglio, 2008). This topic relates to innovation and has a strong influence from technology management. The third relevant project area within IBM is the technological research published in such outlets as the *IBM Journal of Research and Development*. This research is centred on applied technology but also considers managerial and business implications (see e.g. King, Orani & Parr, 2014).

My own research is driven by the goal of generating publications useful to business practitioners. This priority has influenced the research design and my actions during the research process. The direction and inspiration that I have received from the two sources described above have encouraged

me to perform research that involves frequent contacts with companies, crossing theoretical boundaries and seeking to ensure the gradual diffusion of findings into practitioner channels. This approach resembles the model of "engaged scholarship" (Van de Ven, 2007).

3.2.1 ENGAGED SCHOLARSHIP AS PRACTITIONER AND RESEARCHER

The implementation of requirements arising from regulatory change in products, processes and technology is embedded in the practice of firms. To conduct empirical research on this topic within actual companies, it is helpful to have established connections to research settings. Therefore, it made sense for me to build on my own position as a practitioner working in and with a specific industry, since my connections provided a platform to deliver both practical and theoretical insights (Van de Ven, 2007). Research that takes practical problems as its starting point and then converts the information obtained into practical use is termed "engaged scholarship" (Van de Ven, 2007). Delivering research that is relevant to practice while also contributing to research knowledge in a given domain is a key feature of engaged scholarship (Van de Ven & Johnson, 2006).

My role as a researcher can be related to the four different forms of "engaged scholarship" (Van de Ven, 2007, p. 27), which can be distinguished by whether the researcher stands inside or outside the setting and whether the purpose is to design or describe. I find myself oscillating between two locations in the matrix; sometimes I conduct collaborative research with practitioners, but due to my dual role I sometimes act as a practitioner (management consultant) by performing interventions. These actions take the form of proposing approaches for managing the impact of regulatory change as well as actually performing work as a consultant. For the purpose of this research, I have attempted to maintain a connection to the empirical environment, but not to be personally engaged in it.

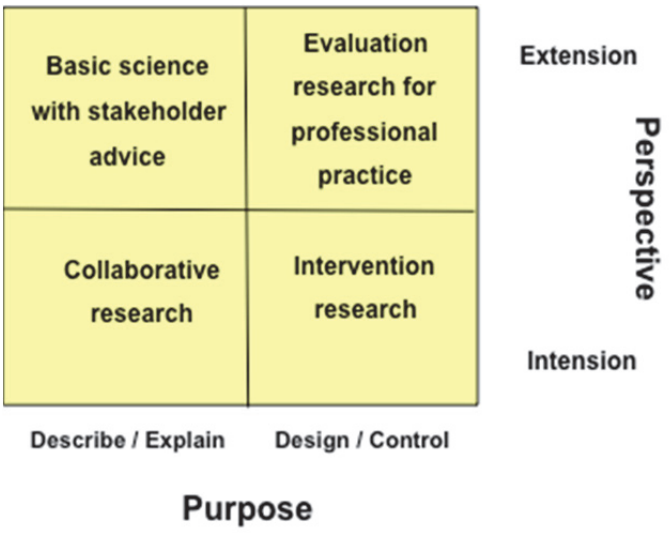

Figure 3. Different types of engaged scholarship. *Source:* Adopted from Van de Ven (2007), p. 27.

The interactions used in the research process gave me opportunities to gradually enrich the pure historical data with insight from current regulatory change processes to validate my findings. To make the historical data and interviews relevant for current practitioners (and to better understand the findings from the data), I engaged in active dialogue, relating the historic event of a regulatory change to the business situation of current and on-going regulatory changes. I attempted to bridge historic and current research approaches through co-production and close dialogue with managers (Burgelman, 2011). The elements of co-production and constant iteration in research that remains close to yet distinct from practitioners helped me to develop as an academic researcher from my starting point within industry.

3.2.2 COMING FROM WITHIN THE EMPIRICAL SETTING TO STUDY IT

Being an industry insider offers its pros and cons. I have worked for 30 years in and with the financial services industry. Much of that time has been dedicated to the life insurance industry. This background enables me to relate to the empirical material and gives me a strong understanding of the terms and concepts used in the industry. I did not have to go through a

time-consuming process like that described by Jacobides (2005, p. 469) to learn to speak the language of the industry. My connection with the industry also provided access to respondents, knowledge of empirical data sources, and keen interest in the practical implications of my theoretical findings. On the other hand, drawbacks include limited generalizability, the risk of approaching the results from a pre-conceived point of view, and the risk of becoming too involved in the production of data or perhaps influencing interviews. To mitigate these drawbacks, the empirical data were validated in collaboration with research colleagues who did not have my empirical pre-dispositions. This process included validation of the theoretical base of my conclusions and reflections when processing interview data. In this way, my personal journey became an integral part of the research process.

3.3 RESEARCH DESIGN

To understand firms' responses to regulatory change, as already noted, we benefit from observing them over time. The research design should thus cover empirical data over a reasonably long period of time. Such a design can be achieved through an historical and retrospective approach or a longitudinal study (or a combination of these).

Because existing theory related to the problem is a mix of well developed and less evolved research, a qualitative research method is appropriate (Edmondson & McManus, 2007). In this approach, data are collected through in-depth studies of empirical sources in order to formulate new theories (Barratt, Choi & Li, 2011). Among prior studies on firms' responses to regulatory changes, Ferraro and Gurses (2009) and Funk (2014) both applied a pure historical method when collecting data on the US movie industry and the US broadcasting industry, respectively. The studies by Jacobides (2005), Cacciatori and Jacobides (2005), and Jacobides and Winter (2005, 2010) used mixed sources, including interviews as well as archival industry material from the banking and building construction industries. This thesis similarly applies a combination of historical data and interviews applied to six case-study firms.

Since the key question is related to firms (and their relative differences), the unit of analysis is the firm taking action to implement new requirements following a regulatory change. The sampling of relevant firms will be described below. The choices made regarding the two fundamental components of the research design, historical studies and a qualitative case method, will be outlined. I will also present a rationale for selecting the financial services industry as my empirical setting, as well as the specific sample of firms within the Swedish life insurance industry.

3.3.1 HISTORICAL AND RETROSPECTIVE STUDIES

The impact induced by new regulatory requirements appears over a long period of time. Historical methods are useful for developing longitudinal dimensions of qualitative research and for the study of complex social systems (Burgelman, 2011). Studying such changes requires both looking back and tracing events up to the current time. The basis for collecting rich data for such studies has been established through historical studies on selected industry segments since 1900. The present thesis reviews data from 1990 until 2007. As a complement to the primary use of the historical method, a longitudinal element has been added by examining the impact of recent (2008 to 2016) regulatory changes. The historical data include quantitative market data from the industry to further complement the findings from qualitative observations (Barratt et al., 2011). This triangulation can compensate for weaknesses in the pure historical methodology (Leonard-Barton, 1990).

The use of data from historical sources has been approached in line with previous studies on long periods of evolution in response to regulatory change. In these studies the use of extensive historical material has been complemented by interviews (Jacobides, 2005). Examples of such studies published in well-respected academic journals have examined the UK building industry (Cacciatori & Jacobides, 2005), the bicycle industry (Fixson & Park, 2008), the US movie industry (Ferraro & Gurses, 2009) and the US broadcasting industry (Funk, 2015). All these are studies of events over time (Pettigrew, 1990). Studying events after a regulatory change over time

creates the possibility of uncovering tensions and conflicts that can arise when the industry structure and firms' positions change (Baldwin & Clark, 2000).

My combination of historic archival sources, company documents and interviews at different phases of the study could be related to appreciative theorizing (Nelson & Winter, 1982), with several iterations taking place between theory and evidence. The steps applied included review of public archival sources describing the general evolution of the industry, in conjunction with interviews, so as to compare patterns arising over time as identified by these different sources (Jacobides, 2005).

An additional benefit of a long period of study is that it permits more thorough consideration of the interdependence of factors studied (Soh & Roberts, 2003). The long-term perspective of this study (over 15 years) makes it possible to understand the effects of other sources of impact beyond the regulatory changes experienced (Bergek, Berggren, Magnusson & Hobday, 2013). Such changes could include, for instance, technology advances and organizational actions (such as mergers and acquisitions). In the empirical section below, I will further address the potential impact of such factors in the financial services industry.

One particular regulatory change has been selected for study. It was selected due to its perceived impact on the structure of the industry, which should be clearly identifiable. The date of the regulatory change is sufficiently far back in time to permit long-term analysis, but not so distant as to make data access difficult. This particular change is also well suited for exploring the impact areas outlined in the theoretical background (i.e. products, processes and technology), and it had implications for both dimensions of the theoretical framework (integration of new and existing products, processes and technology, and use of external providers). The selection of this particular change could therefore be characterized as theoretical sampling (Eisenhardt, 1989; Yin, 1994). The state of theory and the nature of the research question support the use of a qualitative case study.

3.3.2 QUALITATIVE CASE STUDY METHOD

Knowledge regarding businesses' implementation of new requirements from regulatory changes is still at an early stage, since a limited number of studies have focused on this specific topic. There is a need for further insight into the constructs and the potential connections and relationships between them (Voss et al., 2002). The further development of theory will benefit from asking open questions in a qualitative case study setting (Edmonson & MacManus, 2007). Such case studies are gaining recognition in the field of operations and innovation management as a way to generate theory (Barratt et al., 2011).

The combination of a qualitative approach to data with multiple case studies is suitable for the problem identified, which deals with a complex phenomenon that will benefit from further exploratory research (Voss, 2009). The case study can highlight previously unknown concepts and observations that are best unearthed through an open but structured approach to the data (Miles & Huberman, 1994). The selection of case studies takes into accounts my prior experience and insights as a researcher of this industry environment (Jacobides, 2005). This insight facilitates the detection of anomalies and similarities with previous theory by moving back and forth between cases and theory (Barratt et al., 2011).

Qualitative case studies also call for a continued dialogue with practitioners in the industry, due to the need to gather rich data from relevant sources (Voss, 2009). The process involves first making contact with companies to gather data, followed by determination and validation of findings and then the presentation of results to business practitioners. This process is consistent with the approaches of collaborative research (Adler, Shani & Styhre, 2004) and engaged scholarship (Van de Ven, 2007) as explained above.

3.3.3 FINDING THE EMPIRICAL SETTING

A study of firms' responses to regulatory change could be done within any industry, in any firms and in any part of the world. To define a manageable scope for this thesis, several decisions were made to limit the empirical

setting, including the selection of the Swedish life insurance industry for examination and then of one particular regulatory change (out of 11 major changes that have occurred since 1900). Then, six firms were identified as cases; finally, appropriate respondents within these firms were recruited. To achieve complementary perspectives, both first-hand interviews and relevant archival data sources were used.

Previous research has positioned deregulation (Madsen & Walker, 2007) or status as a highly regulated industry (Gurses & Ozcan, 2014) as environmental conditions that influence firms and industries. All changes in regulations (i.e. regulation, deregulation or re-regulation) are considered of equal importance with regard to understanding implementation actions by affected firms. In fact, the term "deregulation" is slightly misleading, since the removal of a regulation usually involves its replacement by another one that may be perceived as allowing more innovative activities. Also, to characterize an industry as "regulated" is somewhat ambiguous, since almost no industry is devoid of regulation. Hence, the level of regulation is of less importance in the arguments presented here than the implications of the regulatory change. It is the change *per se* that will cause firms to consider novel actions. The most important task is therefore to find such a change that presents the best conditions for studying firms' actions.

3.3.4 THE FINANCIAL SERVICES INDUSTRY AS EMPIRICAL SOURCE

In recent debates and news reports, the financial services industry has claimed to be "under assault by regulators" (Son, 2015). This is an industry in which regulations and regulators frequently play a significant role in the evolution of firms and how they manage their business.

The general perception of the financial services industry is intriguing. On one hand, the industry is seen as innovative when creating products and instruments that deliver value, but it is also viewed as potentially destructive to countries and economies. Moreover, the industry is sometimes painted as a hub of radical innovation, one in which firms constantly provide products and services that challenge existing frames of reference and push

boundaries, yet some see its products and services as essentially similar to those offered centuries ago. The innovations provided in financial services are sometimes described in public discourse as "useless" and not innovative". In December 2009, Paul Volcker, former chairman of the U.S. Federal Reserve, shocked the financial world by telling an audience of senior finance executives that the banking industry's single most important innovation in the past 25 years was the automated teller machine, which, he added, had at least proved "useful" (Armitstead, 2009; Hosking & Jagger, 2009).

Proponents of the Optional Federal Charter—a proposal to allow US insurance companies to choose between a current state-based regulatory system and a single federal regulatory agency—contend that "the [insurance] industry has not introduced a single entirely new property and casualty insurance product for individual customers" since 1959. This comment and Volcker's seem to support a popular verdict on innovation in the financial services industries: there is little innovation and, when it does occur, it is incremental and typically of minimal real value (Lehrer, 2007).

Academic sources have described the financial services industry as an empirical ground for studying the "survival of the reckless" (Jacobides & Winter, 2010, p. 1) and a sector where actors display systemic consequences of incompetence (Sveiby, 2012). The situation is depicted as a profound problem for regulators and scholars (Jönsson, 2014). Mixed messages have thus been communicated about financial services. Do actors just adhere to the new requirements presented by changed regulations (or maybe even try to avoid them) without considering business success, or can their implementation give rise to market success under certain conditions?

A study of regulatory change in financial services is relevant due to the high level of importance of regulations for these businesses. Regulations are identified as one of the main determinants of innovation in the industry (Mention & Torkkeli, 2012). Since the industry is responsible for managing other people's money, the desire to set boundaries on company actions and to monitor their behaviours is intense. The industry has been subject to a multitude of regulations over the recent decade. Along with some regulatory changes currently in process—related to the Markets in Financial

Instruments Directive (MIFID) and the Foreign Account Tax Compliance Act (FATCA)—there are additional impacts from the evolution of the Basel framework (implemented as Basel 2, with Basel 3 currently in progress). We can also add regulations governing investment funds (Undertakings of Collective Investments in Tradable Securities or UCITS) and the European Market Infrastructure Regulation (EMIR), a European Union regulation designed to increase the stability of the over-the-counter (OTC) derivative markets. Many more prospective regulatory changes are on the table for financial services firms. In addition there is an array of local regulations governing the industry (Eklund & Braunerhjelm, 2013). Such local initiatives relate to transparency towards customers (e.g. regarding interest rates on loans), governance of financial firms (e.g. specific rules applicable to officers of insurance companies) and product-specific regulations (e.g. regarding the promotion of international pension funds in local markets).

How firms view regulatory change in the financial services industry could be compared to "watching an arms race, a contest in which the rules get ever-more complicated as well-resourced banks try to outflank regulators and regulators try to catch up" (Wessel, 2012). As of 2016, a typical financial institution is dealing with around 40 different regulatory changes (Moreno, 2014). Most of these regulations are implemented at a central level in the firms, as well as by each business unit and local subsidiary. The complexity of the combined regulatory pressure could lead to the existence of up to a thousand different projects in each firm, where the potential benefits might reside in the individual project or in the combination of steps to implement two or more regulatory changes.

The above observations indicate that the financial services industry is a suitable empirical ground for relevant case studies to understand the implementation of new requirements resulting from regulatory change. The financial services industry is also of global relevance, and the products and services it provides are present in similar forms in most countries. However, the industry also consists of a broad range of products and firms, from short-term trading in financial instruments to long-term arrangements in the form of life insurance. To make meaningful observations and comparisons, I have limited the research scope to one specific industry segment.

Delimitation to one country is needed in order to limit complexity and disturbances from different paths of evolution in different country markets (see Jacobides, 2005; Tee & Gawer, 2009).

Even though the public debate on the financial services industry is often focused on banks and their regulators, the insurance industry is an equally important segment (Klein, 2012). Also, there have been significant rescue operations involving insurance companies, e.g. the case of AIG in the US (Harrington, 2009). Due to these events, the insurance industry is subject to a growing list of regulatory changes. A radical regulatory change in an otherwise stable industry would provide the best opportunity to study how firms respond to new requirements.

3.3.5 THE DELIMITED EMPIRICAL SETTING: THE SWEDISH LIFE INSURANCE INDUSTRY

The promise of rich empirical information on regulatory change available from the global financial services industry also presents a challenge. A PhD student does not have the resources to collect empirical data from qualitative case studies (or quantitative surveys) in all financial services markets around the world. Therefore, additional limitations are needed in order to arrive at a feasible research design. First, I chose to focus on the Swedish financial services industry due to its proximity and my well-established access to relevant informants due to my industry background. This limitation was considered appropriate, since Sweden is a well-developed and innovative market for financial services[8] and has a high degree of innovation.[9] Also, the state of the regulatory frameworks in Sweden is considered well advanced.[10]

[8] Stockholm was the third-ranked city in Europe for "FinTech" investments; see Wesley-James, Ingram, Källstrand, & Teigland (2015).

[9] Sweden ranked third on the overall innovation index provided by www.globalinnovationindex.org and seventh in the category of business sophistication.

[10] Sweden ranked third concerning Regulatory quality in the innovation index provided by www.globalinnovationindex.org.

To understand the most relevant industry segment to study within the financial services sector a pre-study was performed. This activity consisted of interviews with industry actors and experts across the entire financial services sector. Questions of general nature were asked concerning innovation management and industry dynamics. This investigation led to the selection of the Swedish life insurance industry for study. Advantages for this selection are that the number of actors is limited, making it possible to gain an overview of the entire industry, and that there have been relevant regulatory changes the impact of which can be observed over time. Also, the insurance industry is experiencing accelerating change due to an escalating amount of regulatory implementations.[11] In addition, it has undergone different periods of change, which have been well documented in historical sources. The Swedish life insurance industry was considered a well-developed market in a global comparison.[12] Hence, the observation of this industry segment promises insights that should be of relevance also for a global audience (including academic and practitioners alike).

In addition to the Swedish life insurance industry's suitability from a research design perspective, there is also a good theoretical fit. The effect of implementing new requirements in connection with regulatory change could be expected to evolve over long periods of time (Jacobides & Winter, 2010). To isolate the effects of a regulatory change, it is to our advantage if the other dynamics of the industry are slow, because the firms' actions will be more visible. Life insurance is an industry with very long time frames; agreements can be signed to last for 20 to 40 years, and payout periods can also last for decades (e.g. retirement pensions). The above combination of empirical and theoretical factors offers a solid rationale for studying this industry segment with a historical approach over a long time period (Ferraro & Gurses, 2009).

[11] It has been suggested that the number of measurement points required from regulators for an insurance company will increase from 10,000 currently to 400,000 when proposed regulations are implemented. See the February 2015 insurance supplement in *Dagens Industri* for details.

[12] Specifically, the Melbourne Mercer Global Pension Index, produced by Mercer and the Australian Centre for Financial Studies (www.mercer.com/insights/focus/melbourne-mercer-global-pension-index.html), placed Sweden fourth in a global ranking of pension systems.

3.3.6 SELECTING AN APPROPRIATE REGULATORY CHANGE

The next step in finding a suitable empirical context was to select the specific change to be examined. In the evolution of the Swedish life insurance industry since 1903, there have been 11 major regulatory changes identified. (The overall industry timeline including these changes is reviewed further in chapter 4.) Two major insurance laws were passed in 1903 and 1948. In 1960, a new pension system was launched. In 1990, two laws were enacted, governing fund-based life insurance and independent distributions. Ten years later (1999 and 2000), another pension reform took place and the law for profit sharing was changed. In 2004, the law for financial advice was introduced; 2007 brought changes to the market for occupational pensions; and in 2011, the development of the EU directive Solvency 2 was started. The latest change is the implementation of FATCA. In addition, other regulatory changes are currently under debate in both the EU and Sweden.

To select one of these regulatory changes for study, criteria were established based on theoretical considerations, factors of the research design and the research question. Criteria included the presence of significant perceived impact, indications of differences in impact between firms, and the availability of empirical data relevant to the study. The farther back one goes in time, the more one relies on indirect (archival) data, since interviewees are not available. On the other hand, if a recent regulatory change is selected, enough time may not have elapsed to determine how the regulation has impacted firms in the sector, although one advantage of examining a recent change is that it is in progress and can be studied directly through observation and interviews. Finally, a too-distant historical event will have inadequate and difficult-to-access archival data sources.

Based on these criteria, the fund-based life insurance regulation launched in 1990 was considered the most appropriate regulatory change event to study. Initially, it was expected to have only an incremental change limited to product changes, but the results turned out to be more extensive, with changes also influencing processes such as distribution and services. As a consequence, the impact was also seen in technology and in evolving partnerships with external providers. These changes resulted in different

fortunes for different companies. In addition, empirical sources are available since many of the persons involved in the change are still active in the business today. Additionally, the regulation's legal requirement of setting up separate entities makes data on the industry's evolution more available. Most firms did establish separate entities for the fund life insurance business, and the official industry statistics therefore reflect the performance of these new businesses. This enables the identification of levels of impact as well as differentiation of market success, which is relevant to the thesis purpose and the corresponding research questions.

The approach used to study this regulatory change is outlined below. The description will consider empirical context, data sources, data collection and reflections on the research design. A detailed history of the regulatory change and each firm studied is further outlined in Chapter 5.

3.3.7 DATA ON THE INTRODUCTION OF THE FUND-BASED LIFE INSURANCE REGULATION

The fund-based life insurance regulation was introduced in 1990. Therefore the study is retrospective. Data were available in the form of extensive archival material from public records (industry trade journals, newspaper articles and books) as well as through interviews with respondents involved in the change at the time. The data consist of 34 first-hand interviews with respondents from the financial services industry and the six firms, data feedback workshops and an additional 47 interviews (with respondents from the life insurance firms) and other reports captured from the trade industry press with specific focus on this regulatory change. In addition, 55 books and trade journal articles covering the events related to the regulatory change have been analysed. This extensive data review facilitates understanding of how firms implemented over time the new requirements arising from the regulatory change (Quintens & Matthyssens, 2010). The firms involved at the time of the change included both existing life insurance firms and new entrants, namely banks that bridged into the new industry segment.

3.3.8 FIRMS SELECTED AS CASE STUDIES

Since this thesis aimed to compare behaviour across firms, a relevant number of firms were selected that met criteria relevant to the regulatory change. As a starting point for the selection, all 20 members of the Swedish Insurance Federation were listed. The choices were then narrowed to the 12 industry actors that command 95% of market share and are widely viewed as constituting the Swedish life insurance industry.

Given the nature of the research question, it was considered valuable to focus first on large firms of broad scope, which would normally have more resources to respond to new regulatory requirements with multiple implementation streams and large project portfolios. Among the larger firms, six were found to have appropriate contacts and data to support their inclusion as case studies. These six firms accounted for 70% to 95% of the market over the time studied and could therefore be treated as representing virtually the entire industry. Due to mergers and acquisitions the exact naming and constellation of the firms as business groups has changed several times since 1990. The empirical account has been adjusted to consider the changes in structure by using the current constellation of the financial services groups in the market and reflecting it in the historical data. In addition, in this chapter, the firm specific empirical data (Chapter 5) and the analysis (Chapter 6) neutral names have been used. The main reason is to avoid confusion by using the different names of the firms. Explanations of these adjustments are provided in the empirical section. The adjustments are not deemed to influence the results of the study. As a complement, data are available about the entire industry and the firms from public sources.

Measurements of success in implementing new requirements can be made using different metrics, such as revenues (or other business volume), profits and speed of entry into a market. Additional metrics such as customer satisfaction, market capitalization (e.g. share price) and brand equity can also be considered. For this study, I have chosen to define success is terms of three factors. First, the speed of entry into the new market is reviewed, because a first mover can gain advantages in the financial services industry (Lopes & Roberts, 2002). The second criterion is

revenue (measured by the premium volume as reported in official statistics from the Swedish insurance association). The third measurement is the amount of assets under management, which is generally considered the main measure of success in life insurance (due to the possibility of extracting management fees from the asset base and thereby creating value[13]).

Net profit is not considered a relevant measure for four reasons. First, the long-term nature of life insurance distorts yearly profits due to development of the business (e.g. strong growth might reduce profits due to the financing of setup expenses). Second, several of the main actors in the industry are part of larger financial services groups, and here profits might be reallocated internally. Also, the transparency in reporting is not the same as for a public company. Third, the outcome of profits is easy to distort should a company wish to distribute it over time or across different organizational units. Finally, some firms are actually owned by the customers (e.g. mutual insurance), and the profit here is a theoretical amount that is redistributed to customers. For the same reasons, the value of shares on the capital market is not a viable measure for the firms in this market segment.

The time period selected for study was 1990 to 2007.[14] The measurements of success are all derived from official market statistics provided by the common association for insurance firms in Sweden. Three of the six firms (referred to here as Kappa, Delta and Beta) were consistently the most successful concerning premium volume (Figure 4). As for the volume of assets under management, Kappa and Beta were the most successful (Figure 5). These two companies were also the quickest to enter the new market.

[13] For a detailed review of how the financials work in life insurance, see Swiss Reinsurance (2012).

[14] The decision to study the first 17 years after the new regulation (1990–2007) is a balance between the time needed to observe patterns of impact and avoiding too much influence of other change factors such as subsequent new regulations and technology.

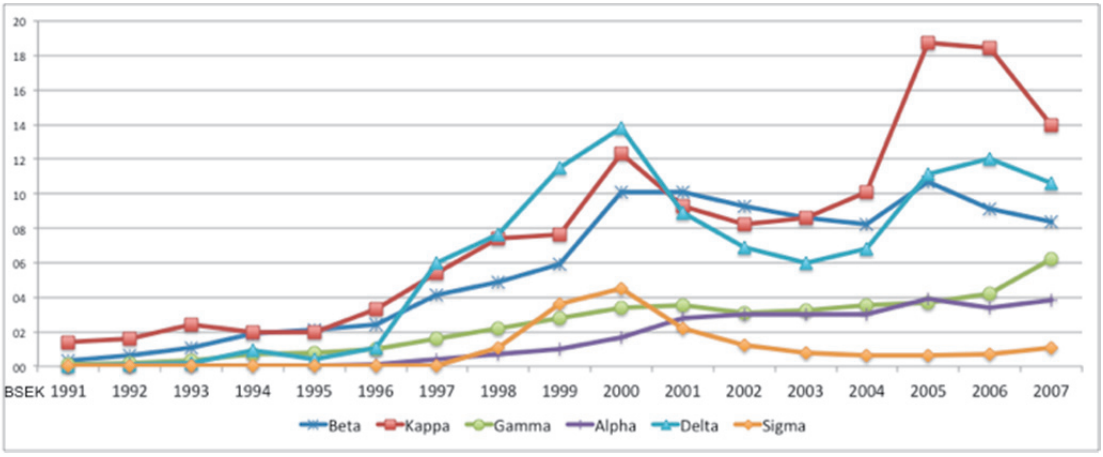

Figure 4. Market volume (insurance premiums) for the six firms studied, 1990–2007

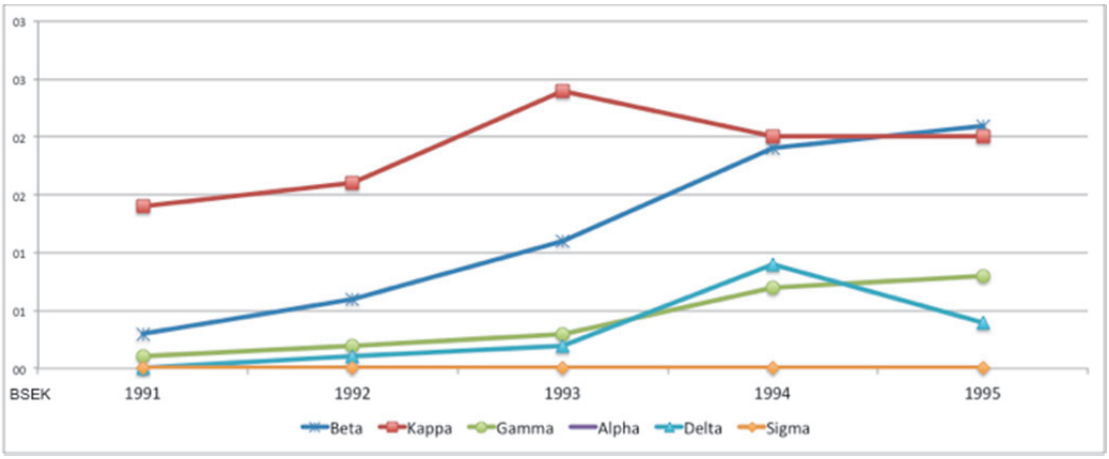

Figure 5. Market share development over the first five years after the regulatory change

Overall, both Beta and Kappa fulfilled all three criteria for a successful firm. In the analysis, these two firms will be contrasted with the other four concerning the actions performed to implement the new regulatory requirements. If we treat business volume over time and speed of market entry as two dimensions of success, we can categorize the six firms' results as shown in Figure 6.

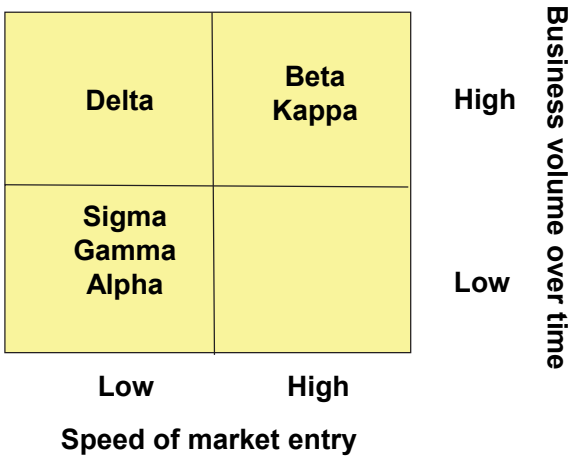

Figure 6. Overall performance of the six case-study firms

3.3.9 RESPONDENTS WITHIN THE FIRMS SELECTED

To obtain qualitative data from case studies of the regulatory change, access to firms for empirical data is required. The collection of such data took place partly through interviews with representatives within each organization. Representatives of the firms also made archival data available. To achieve a balanced collection of data, the relevant roles of such representatives have been outlined. The key characteristic of such a person was his or her involvement in regulatory change projects as well as insight into changes to products, processes and technology. Such persons have the best insight into the data being researched, and they are characterized here as principal informants (Voss, 2002).

Three different sub-types of roles have been outlined to obtain a proper mix of views from the respondents; customer-facing (with insight into the processes where the firm's products meet the customers); process and service officers (responsible for the organization of work processes constituting the total delivery of the functionality); and respondents who addressed technology issues, since their responsibility was to provide the supporting tools that enable the implementation of new requirements. These areas match the impact areas identified in the theoretical framework (product, process, technology) and are covered across all selected firms. The

respondents have been selected to maximize the variety of sources and to give different pictures of the evolution of the industry (Jacobides, 2005). Moreover, interviews with life insurance executives reported in industry trade journals have been used to complement the first-hand (retrospective) interviews and provide views of implementation activity shortly after the regulatory change. See Figure 7 for a visual representation of the process of identifying the various sources.

3.4 DATA COLLECTION

3.4.1 DATA SOURCES

The data combine original interviews conducted for this thesis with interviews and historical archive material from industry trade journals and

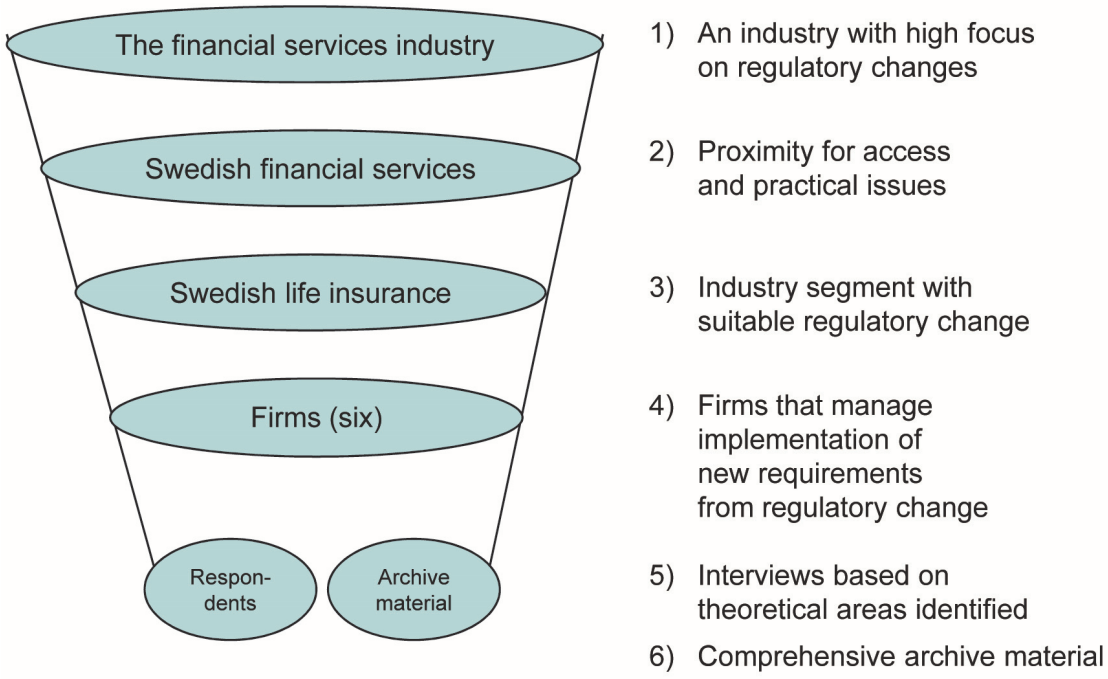

Figure 7. Summary of the derivation of empirical sources for the study

books, containing specific and in-depth accounts of the industry's evolution. Apart from data on the six firms featured, I also sought to understand the industry's overall historical evolution, including all major regulatory changes.

The interviews and trade journal articles contributed to an overall grasp of the regulatory change situation in the financial services industry. This information provided important contextual information for interpreting the change that took place in 1990 in Sweden.

The data sources also include official quantitative statistics regarding firms and their position in the market. The quantitative data were used to understand in detail the evolution of firms' performance after the regulatory change. Through the application of both qualitative and quantitative market data, the study's validity is improved (Brusoni & Prencipe, 2001). Historical sources provide a good basis for interpreting the evolution of an industry and the firms within it (Lopez & Roberts, 2002).

3.4.2 ENTERING THE FIELD

Before entering the research field, I held several informal discussions with industry experts, followed by a review of research literature, industry structure and current innovation issues (Eisenhardt, 1989). As I developed my initial thoughts, I conducted my first round of interviews, in which I aimed to test and validate the interview protocol and to identify the relevant role types of persons who would make the most effective interviewees (Karlsson & Sköld, 2007). In addition, I was seeking to find a balance by speaking the language of the industry but without integrating predisposed conclusions into the data collection process (Jacobides, 2005).

It was somewhat challenging for me to enter the field as a researcher when I was already widely known as a practitioner and management consultant. My position created the tension of being perceived as a "doppelganger" like Dr Jekyll and Mr Hyde (Learmonth & Humphreys, 2012). The research process involved a gradual transformation from a pure practitioner into a hybrid appearance. My evolving role could be manifested in interviews, where I clearly explained that I was functioning as a researcher and not as a consultant.

Table 3. Summary of data sources[15]

Firms and data sources	Personal interviews (including workshops)	Interviews (trade press)	Other literature (books, articles)	Total
Beta	3	4	3	10
Gamma	3	6	1	10
Alpha	3	4	1	8
Kappa	3	6	1	10
Sigma	3	6	0	9
Delta	3	4	0	7
	18	30	6	54
Insurance industry level	6	7	39	52
Financial services industry level	10	10	10	30
Total number of data sources	34	47	55	136

3.4.3 THE INTERVIEWS

I conducted 18 interviews at various levels of the six firm organizations. All were experienced members of the industry. The interviews lasted one to two hours, and each one took place in a private, relaxed setting at the interviewee's office building. All interviews followed an open-ended or semi-structured approach, with general probing questions such as "What is your account of the introduction of the fund-based insurance regulation?" The open dialogue gave the respondent the liberty to answer questions independently (Fontana & Frey, 1994). If follow-up was needed to more fully cover aspects of the theoretical framework, I asked a more prompting question such as "What were the implications for your products?" Hence, the flow of the conversation varied between interviews. I was not only a

[15] A detailed list of sources is found in Appendix B.

passive note-taker in the interviews but also engaged in conversation with the respondents. My engagement took the form of asking follow-up questions, referring to my own experiences and validating respondents' statements. I believed that active conversation would be the best way to generate otherwise hidden data in the form of colourful stories and critical recollections that would depict key events and processes. The interviews were stored on digital media and in hand-written notes. Later, they were converted to text protocols consisting of either full word-for-word transcriptions or summary notes.

3.4.4 ARCHIVAL DATA AND INDUSTRY PUBLICATIONS

The regulatory change examined in this study happened more than 25 years ago. Even though some respondents were involved at the time, their recollection of events would benefit from a complementary data source. Therefore, written reports from the companies and articles from the industry trade press were used to complement the interviews. Articles and interviews from trade journals offered complementary historical views from key respondents involved in the regulatory change. Only a few media sources cover the Swedish life insurance industry closely,[16] making the identification of sources easier. Footnotes in key articles were scrutinized and references reviewed to identify further sources of empirical accounts. The end result was the identification of 47 archival sources (including articles, book chapters and books), which complemented personal observations and interviews as the primary data sources (Eisenhardt, 1989; Meredith, 1998). The combination of the historical approach and interviews moderated the risk of bias due to the controversial and sensitive nature of the topic or interviewees' different attitudes about their firms' results (Bergek et al., 2013; Ferraro & Gurses, 2009).

[16] The key publications that cover the Swedish life insurance industry in detail are *Risk & Försäkring* (Risk and Insurance), issued by the publisher Svenska Nyhetsbrev, and the journal of the four Nordic countries' insurance associations, called *Nordisk Försäkringstidskrift* (Nordic Insurance Magazine).

3.4.5 DATA COLLECTION INSTRUMENTS

The instruments devised for data collection (interview guides and guidelines for collecting data from archival sources) were designed with reliance on concepts and dimensions from previous theory in the form of a-priori constructs (Barratt et al., 2011). The elements from the theoretical framework (products, processes and technology) were included either directly in questions or as related concepts with a practical business meaning (e.g. a product might be discussed as an "insurance contract" or "savings account"). The intention was similar to that in an inductive research process, which iterates between learning from empirical data and testing and validating previous theory (Jacobides, 2005; Voss, 2009). To build a gradual understanding of the research setting, I divided my interviews between a first and a second round (Brusoni & Prencipe, 2006). In summary, the data collection approach featured the use of multiple empirical sources, facilitating the triangulation of research results and the detection of any anomalies (Van de Ven, 2007).

3.5 APPLIED FIELD STRATEGIES TO PRACTICE ENGAGED SCHOLARSHIP

In my role as a researcher I have applied four different field strategies to practice engaged scholarship: detached academic researcher, historian, management consultant and speaker at events. The potential for some tension was initial present, given my previous role as an industry employee and management consultant (Bartunek & Rynes, 2014). These four strategies were applied in different phases of the research project to balance understanding of and access to empirical data and to validate the findings in an iterative process (Van de Ven, 2007).

3.5.1 DETACHED ACADEMIC RESEARCHER

When I became a detached academic researcher, I attempted to create some distance from my previous self (as a practitioner) and my pursuit of data for the academic project. I conducted interviews following a prepared protocol

and, if I knew the person from a prior practitioner relationship, took particular care to establish the interview relationship as a new dialogue. Pointing out the distance between my roles as practitioner and researcher helped me to establish a suitable position for a research dialogue. The interactions generated structured responses to interview questions. By taking on the role of a researcher, I was able to enter more open dialogues. Interviewees shared deep accounts of personal experiences were told to me, something that they would not have been likely to do with a consultant.

3.5.2 HISTORIAN IN THE ARCHIVE

I also spent considerable time locating and scanning archives. For this part of my research, I was an introvert, concerned only with finding the proper data sources. Those sources included microfilm and physical copies of books and magazines that were then scanned and copied to a digital or physical source. The data generated here consisted of a large amount of open and deep accounts of the evolution that occurred following the regulatory change. These data supplemented my direct contacts with respondents, and by digging through footnotes in articles and books, I identified further material. I also had the benefit of clearing my mind of my pre-conceived thoughts as a current practitioner by stepping back to the time when the regulation initially was enacted.

3.5.3 MANAGEMENT CONSULTANT

One reason for entering the academic world and a goal of my research project was to deliver relevant material for practitioners. To stay in constant touch with the industry, I often adopted the strategy of a management consultant, creating an engaging dialogue with the target audience. This strategy was realized in the context of an advisory role on projects or in a stand-alone topic discussion. I could thereby test ideas and conclusions from my research findings and get new suggestions of empirical sources. When functioning as a consultant, I was careful to use my access to project data only to validate thoughts regarding the historical regulatory change. The data generated in this way included personal notes and summaries of the

discussions. The advantage of my participation as a consultant was that I could obtain additional perspectives from current practitioners who were not aware of the regulatory change in 1990, but who had views on the relevant events and were also deeply involved in other, more recent or prospective regulatory changes.

3.5.4 SPEAKER AT EVENTS

In various forums and with different levels of formality, I summarized my academic findings to business by serving as a public speaker. I participated in a range of different events, from a formal presentation at a conference arranged by a Swedish business news source to a panel discussion with 70 innovation managers at a major financial services company. The approach here was to formulate findings in a different way than for academic audiences and then to receive feedback that guided further refinement of the academic results. The notes taken at these events were used as additional and complementary empirical observations. For example, I participated in one conference at which speakers discussed their companies' approaches to regulatory change and was able to compare these notes with the same firms' actions in the wake of the 1990 change.

These last two strategies (as management consultant and event speaker) represented a vital element of my research process by inducing engaged scholarship as both practitioner and researcher. My gradual shift of identity can be articulated as "coming out in the field" as I became viewed as a more theoretically oriented counterpart to industry respondents (McDonald, 2013). The process was fruitful in that I was able to function as a practitioner and researcher simultaneously, but also challenging as I sought to manage and avoid conflicts between multiple identities.

3.5.5 ENGAGED SCHOLARSHIP: IMPLICATIONS FOR DATA COLLECTION

My main advantages in collecting data as an exponent of engaged scholarship were access to respondents and knowledge of empirical data sources. I was readily able to identify potential respondents at the six

targeted firms. From a first review of accessible informants, over 100 respondent candidates, who occupied a balanced mix of roles at their firms, were identified. To validate the relevance of my eventual selections, I took two steps. First, at each interview I asked the respondent to recommend additional interviewees. The answers to this question generated a number of new potential respondents. Second, the selection of persons to interview was balanced between persons with whom I had a deep relationship (to facilitate an open, candid dialogue) with new acquaintances (to inject new perspectives into the dialogue). Although I could readily identify the primary trade journals and books pertinent to the Swedish life insurance industry, I validated this knowledge by reviewing references and notes in the books and by conducting additional Internet searches on Sweden's regulatory changes.

One drawback in my approach, as noted earlier, is the risk of becoming too involved in the production of data and influencing the interviews. To reduce this problem, I reviewed interview techniques, carefully followed a defined protocol in my initial questions, and, when transcribing interviews, made notes on how I could be more attentive to stressing the respondents' freedom to articulate their views at those points.

Once the data were collected, the next steps were to extract, reduce and code them (Figure 8) so that suitable output could be available for within-case and cross-case analyses.

3.6 EXTRACTION, REDUCTION AND CODING OF DATA

The data extraction, reduction and coding were performed in separate and sequential steps. First, before the data extraction, the full body of data sources was consolidated and reviewed to identify key segments of data.

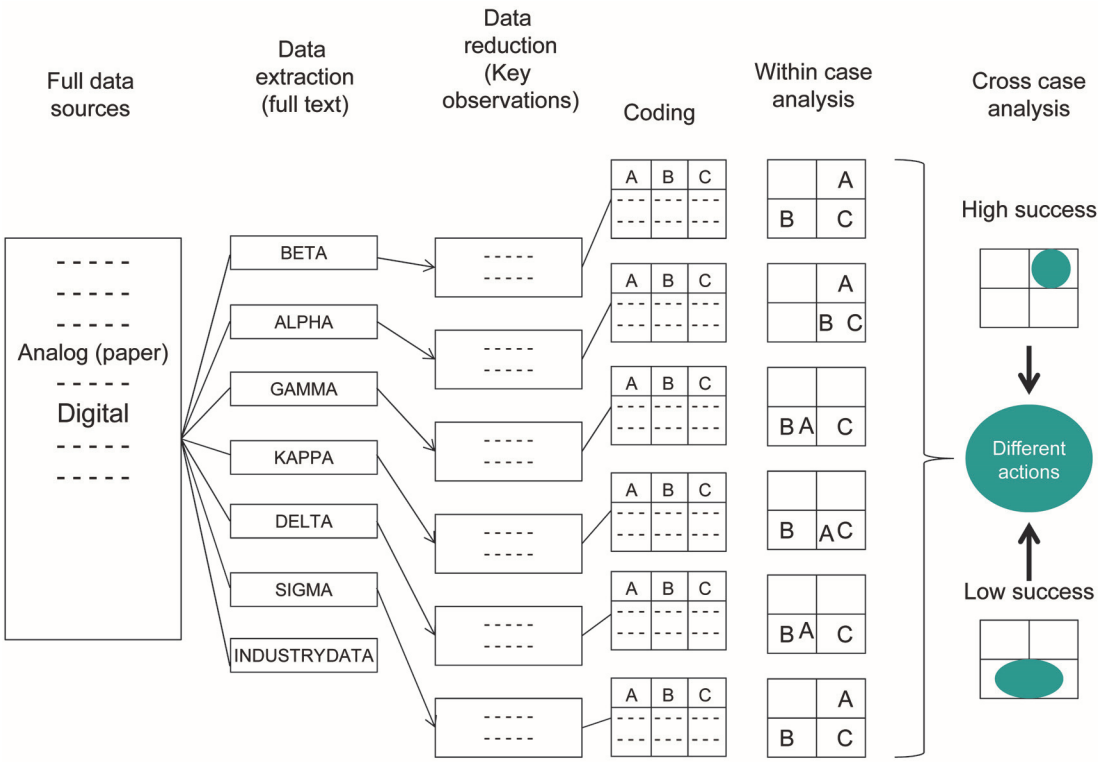

Figure 8. Summary illustration of the process of data extraction, reduction, coding and analysis

This step was needed due to the vast volume of data and the different formats of the sources (including paper-based and digital materials, as well as text in both English and Swedish). Data from firms other than the six selected for case studies and information regarding events, actions and dynamics outside the boundaries of the analytical framework were excluded. At this point, I also excluded generic descriptions of factors surrounding the industry, which were not deemed to add value in the analysis of the firms' actions. The result was a vast dataset containing identified relevant blocks of text that depicted the individual firms' actions in relation to the selected regulatory change. The empirical material selected in this way became the basis for data extraction.

3.6.1 DATA EXTRACTION

The empirical material selected was divided by firm. This process included extracting entire interviews and articles as well as book chapters or individual paragraphs or sentences from newspaper articles. A list of data sources was created for each firm, along with a bucket of residual data to be used in describing the impact at the industry level. The next step was to turn the blocks of text into summary narratives on each firm, plus one industry-level narrative. The narratives consisted of texts directly from the source documents, complemented by my notes on the events described. This step helped to identify irrelevant data that could be discarded (Miles & Huberman, 1994). Writing new text in conjunction with references to source texts produced an overview of the evolution and actions of each firm. To verify my interpretations of these complex issues, industry experts (consultants with extensive life insurance experience and selected life insurance officers) reviewed these narratives and I made notes on their feedback. This step resulted in a relevant set of information on each firm from which data could be reduced.

3.6.2 DATA REDUCTION

As a next step, categories of observations were identified to summarize and organize the empirical material. The case narratives were used as a basis for this step, with frequent looping back to the raw empirical text sources and the narratives. Categories were derived in accordance with the study's theoretical framework, but I also remained open for capturing new categories (Miles & Huberman, 1994). The categories were compiled through the construction of one table per firm. The columns in the table evolved and the category headings varied depending on the content of the empirical sources. The observations were marked in the extracted data and entered in the appropriate column. A link back to the empirical sources was provided because the rows of the document contained references to the relevant source. The headings of the table were typically related to the theoretical framework, such as products, processes (services, distribution) and technology, but could also be associated labels (e.g. information,

alliances). The result was a table with references to empirical sources and observations of relevant segments of the data. The material remaining after the data reduction was used to apply coding based on the dimensions of the theoretical framework.

3.6.3 CODING

After these data reduction steps had been taken, the data in the table were coded to identify specific actions, which were then related to the areas of impact defined in the dimensions of the theoretical framework. This step involved reviewing the reduced data and selecting a condensed number of categories per firm, consistent with the theoretical framework. For each category, observations were made regarding actions taken by the firms across the framework dimensions. Observations were linked back to empirical sources, and descriptive quotations and illustrative segments from the original text were tied to items in each category (Miles & Huberman, 1994). Then a search for repeatedly occurring patterns in the firms' actions was undertaken. The patterns were then summarized for each firm through a review of the observations in the tables for each firm, which were linked to the four cells of the framework. This step resulted in a list of statements on each firm's decisions to integrate new and existing products, processes and technology and on its use of internal and external providers. The statements identified were later compared to the theory used to derive the framework in the analysis step.

3.7 ANALYSIS OF THE DATA

After the coding of the data, the next step was to relate the coded material to the research underlying the theoretical framework. The analysis was performed in three steps. First, each firm's experience was examined individually (within-case analysis), noting whether its behaviour ranked as high or low in terms of integrating new and existing products, processes and technology, and also with regard to its use of external providers. Placing the firm's choices in one of the four quadrants described in chapter 2 is a simplification that permits easier comparison of results across firms and

with the theory behind the framework. The within-case analysis identified the unique features of each firm's actions in connection with the regulatory change process. Secondly, a cross-case analysis was performed, comparing the six firms in search of patterns across the cases. Third, I examined how the firms carried out their actions over time during the period after the regulatory change (Jacobides, 2005; Funk, 2015). This step was performed to identify evolving tensions and conflicts arising as a result of the change (Baldwin & Clark, 2000).

The dimensions in the theoretical framework guide the analysis of the empirical data. The overall process resembles the three steps proposed by Miles and Huberman (1994) for performing qualitative research: data reduction, data display, and interpretation and verification. Comparable approaches have been applied in previous studies with a similar research design and on related topics (see e.g. Cacciatori & Jacobides, 2005; Ferraro & Gurses, 2009; Funk, 2015).

3.7.1 WITHIN-CASE ANALYSIS

This step of the analysis used the theoretical framework with each case firm separately by relating the basis prepared from the step of data reduction to the dimensions of the framework. The analysis of each case involved an outline of the relationship to the dimensions of the framework. Actions of the firms concerning integration of new and existing products, processes and technology as well as the use of internal and external providers are defined and plotted in the framework. One version of the framework for each case firm was populated with the corresponding results. The results detected for each firm were then further compared and explored in the cross-case analysis.

3.7.2 CROSS-CASE ANALYSIS

This step of analysis compared the results of the analysis of each firm with each other. Patterns in the actions of all six firms were reviewed in relation to the theoretical framework. First, the major similarities and differences between the firms were listed, with special attention to contrasting the more

successful and less successful firms. This analysis led to the identification and categorization of the different actions taken with regard to integration of new and existing products, processes and technology and the use of internal and external providers. These approaches were then described based on the empirical observations and also compared with the theoretical framework. As a final step, the within-case analyses were consolidated into a common analysis in which the individual observations were related to each other across all firms.

3.7.3 ANALYZING EVOLUTION OVER TIME

The final step of the analysis was to consider evolution over time after the regulatory change. This step aimed at understanding the changes that occurred in the industry and in the position of firms (Ferraro & Gurses, 2009). Tensions and conflicts arising from the regulatory change over the subsequent 17 years were identified (Baldwin & Clark, 2000). The changes over time reflect how the firms' actions compared to the theoretical framework at various points after the regulatory change and indicate whether the more or less successful firms took action in distinctive ways in different times after the change.

3.7.4 ENGAGED SCHOLARSHIP: IMPLICATIONS FOR ANALYSIS OF DATA

To benefit from my prior understanding of the terms and concepts in the industry, I initiated an iterative process in which I explained the empirical results to a research colleague who did not have the same background. In this way, observations and explanations that were natural to an industry insider but unfamiliar to others native could be identified and clarified. One drawback related to having extensive knowledge of a specific industry is a perception of limited generalizability, because such people tend to view the specific characteristics of the industry as unique. To mitigate this tendency, I presented my results to peers and colleagues who work in or consult other industries. Another potential risk related to having considerable prior knowledge is a proclivity to adopt a point of view regarding the results

without considering the contribution of theory. Comparing findings with previous research on the financial services and insurance industry mitigated this shortfall.

3.8 DISCUSSION, CONTRIBUTIONS AND PRESENTATION OF RESULTS

The steps of discussion, contributions and presentation of results were performed to link the analysis of the empirical data with the theories used to frame the research problem and to define the research gap, purpose and research question. Also, as a means of generalizing from the results in the within-case and cross-case analyses, I drew comparisons with other responses to regulatory changes described in previous studies. Additionally, I compared the findings to available information on the other 10 regulatory changes over the history of the Swedish life insurance industry.[17] For two of these regulatory changes studies have been performed outside the scope of the thesis.[18]

In the contribution section, the analytical findings from the study will be compared with existing theories outlined when framing the research problem. The contribution relates to the thesis purpose and responds to the research questions. The phenomenon observed is here related to and compared with previous theory, to assess the potential for development of new theory (Barratt et al., 2011; Silverman, 2006).

It is difficult for a recipient of research findings to understand and follow the entire research process experienced by the scholar who prepared the work (Van de Ven et al., 1990). Hence, a comprehensive basis for insight into how the results and conclusions were derived should be provided. This process is facilitated through the presentation of illustrative examples that offer insight into the full empirical content.

To assure both rigor and relevance, the presentation of results has been addressed to both practitioners and academic channels, through the use of

[17] This comparison is presented in Appendix C.

[18] These studies are reported in conference papers listed in Appendix D.

academic conferences and business events and meetings as publication outlets for preliminary findings. In addition, I have held personal meetings with stakeholders interested in the research, to test the rigor and relevance of the findings.

3.9 RESEARCH QUALITY

Thorough assessment of research quality is especially important when the research presented is of a qualitative nature (Pratt, 2008). The assessment used here draws on several sources that describe quality research as *credible*, *contributory* and *communicable*. Credible research is consistent, rigorous and transparent; to make a meaningful contribution, research should be original, relevant and generalizable; finally, communicable research is both accessible and consumable. In Table 4, the features of this thesis are reviewed in relation to these evaluation criteria. Despite limitations of a self-assessment, indications are here given of strengths and weaknesses.

3.9.1 CONSTRUCT VALIDITY

The process of confirming validity of the results considers the internal validity of two constructs present in the research question, regulations and implementation. Also, the study of actions benefits from being validated, since actions are looked for in the empirical data and positioned in the theoretical framework.

In this thesis, regulations are defined by industry events and methods of responding to them. Thus, a regulation is well defined by the industry and the empirical setting. Life insurance is well defined and the regulators and industry associations list the actors subject to regulations. The selection of the regulation referenced in the case studies was based on extensive review of industry material, my insight into the industry and validation with industry specialists.

Table 4. Assessment of research quality

Research quality criteria		**Approach taken for thesis and reflection on potential risks**
Credible	Consistent	Concepts from theory are well established, and regulatory changes are well defined by industry actors. There is a risk that some constructs are not clearly defined to justify comparison (e.g. other industry changes involved).
	Rigorous	Consistency is maintained from theory to analysis. The challenge is to keep the research model consistent in the iterative cycles and across the different studies.
	Transparent	Open reporting about the process from empirical data to report is attempted. My experience and "luggage of knowledge" provide a potential threat to transparency when processing research results.
Contributory	Original	The research gap is well defined. Based on literature review and market insight there is great potential that this research will deliver new insights to theory. There are other fields where the topic has been conceptually addressed.
	Relevant	The issues of regulations and regulatory change are one of the top current topics in society. Managers are also repeatedly listing this as a problem for which they need better insight.
	Generalizable	Several industries could learn from this focused research, e.g. pharmaceuticals, airlines and automobiles. Also, firms addressing other external changes (such as customer demands and technology) could benefit from considering the contributions reported.
Communicable	Accessible	My strategy was to perform an interactive process of bridging the gap between academic rigor and practical relevance; hence, there is great potential for both academy and business practitioners to access and learn from this research.
	Consumable	I have experienced the process of producing insight that is consumable; hence there is good hope that this will be a research strength. The risk is that I could fail to make the message clear enough to resonate with practitioners.

Sources: The model is based on a dissertation by Mårtensson (2003) and Mårtensson, Fors, Wallin, Zander & Nilsson (2016).

The study of implementation is defined by identifying the actions that the firms have taken to apply the new requirements arising from the regulatory change to their operations. This definition is in line with Klein and Sorras (1996, p. 1057): "Implementation is the critical gateway between the decision to adopt the innovation and the routine use of the innovation within an organization." The new requirements related to the regulatory change and their implementation across products, processes and technology are the equivalent of the term "innovation" as used by Klein and Sorras.

The study also seeks to connect the fortunes of firms after the regulatory change and their actions. The plausibility of the accounts presented of company actions is undergirded by triangulation between archival data, market data and interviews (Figure 9). If a respondent says "We did X" and this statement is supported by data in the other sources, it can be deemed a valid explanation. This approach is important to minimize discrepancies between what interviewees say and what their companies actually did, since research should be careful not to rely only on managers' expressions of their intentions (Olson & Bakke, 2001).

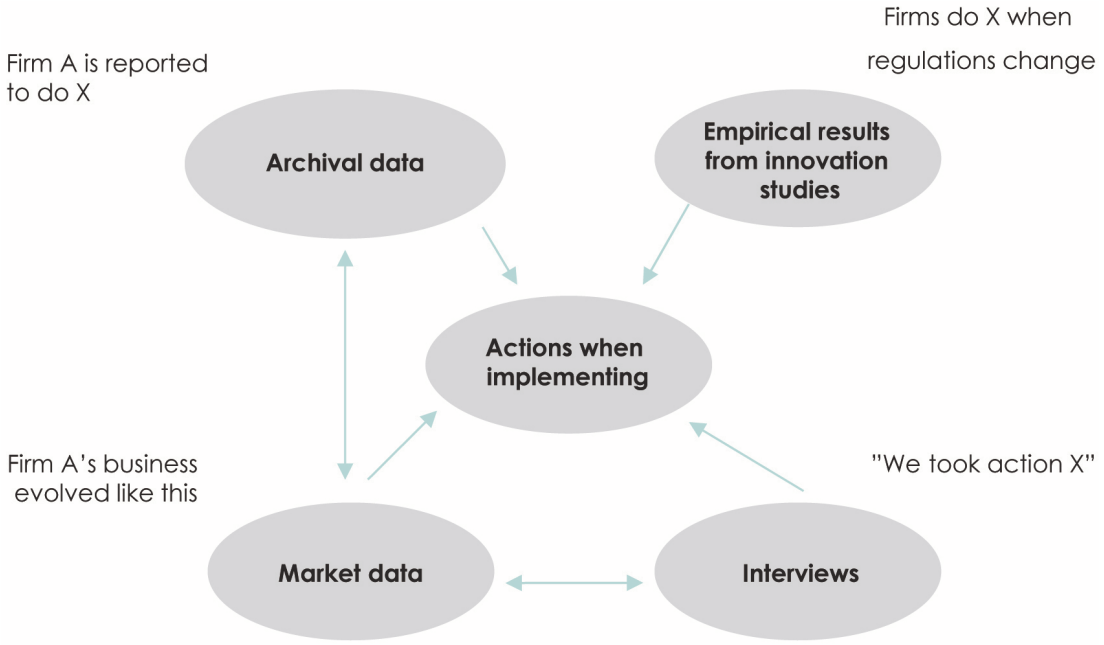

Figure 9. Triangulation to validate firms' actions to implement regulatory change

3.9.2 RESPONSES FROM STAKEHOLDERS

The feedback from stakeholders is presented here as a proxy to discuss the relevance of the research findings. When the research findings were presented to practitioners, their reactions varied. Practitioners at my own firm expressed two types of reflection. The first was positive: "This is interesting research, and we should use it with our customers." However, taking the next step from this insight and making connections to how they could best interact with clients seemed difficult in practice. The second reaction was more hesitant: "The recommendations seem relevant, but what can we sell based on this?" In response to these comments, a business solution related to each main conclusion was created. These solutions offer a basis for on-going dialogues on how the results can be put into action.

Client reactions also fell into two categories. One group thought that the material was very theoretical and could not understand how to apply the findings; the other group really liked the insights and recommendations and wanted to talk about them more. Among journalists, those at the more broadly based newspapers felt that the text contained too much theory, but writers for trade journals and niche publications in the innovation management and financial services sectors were quite positive. One trade journal that focuses on the insurance industry in four countries has already published a version of the practitioner paper (Bieck & Freij, 2011). As part of the process of diffusion, an executive report was posted on an internal global knowledge repository and on an external global website, where it is still available with the text of the introductory page in both English and Swedish.

3.9.3 BRIDGING THE GAP BETWEEN ACADEMIC RIGOR AND PRACTICAL RELEVANCE

The above activities suggest that this research has been successful in bridging the gap between academic rigor and practical relevance. On the academic side, I have had several papers accepted for presentation at peer-reviewed international academic conferences such as the International Product Development Management Conference, the Academy of

Management Conference and the Continuous Innovation Network Conference. The relevance of the research can be shown by the publication and diffusion of management papers, one of which has been downloaded more than 1,000 times in an internal IBM knowledge repository and also extensively by external recipients on-line (Bieck & Freij, 2010), and by presentations at industry conferences as well as at internal company conferences and customer meetings.

3.9.4 REFLECTIONS ON MY MIXED RELATIONSHIP TO THE DATA

In the process of becoming an academic researcher, I have become a different person from seven years ago. My transformation is continuing and I need to be attentive to changes in how bridges can best be built from my academic conclusions to their application in my business environment. The experience of my changing role opens up questions regarding which approach to take when communicating knowledge. Should my knowledge be transferred, translated or transformed (Carlile, 2004)? The answer depends on the gap between the parties involved in the communication. My role as a researcher has developed into a version of a knowledge broker (Meyer, 2010) with elements of the characteristics of a T-shaped manager (Hansen & Von Oetinger, 2001). I am appearing as a creature from both Venus and Mars (Baldridge, Floyd & Markóczy, 2004) and sometimes as a version of Dr Jekyll and Mr Hyde, or a "Doppelganger" (Learmonth & Humphreys, 2011).

Through my intensive and long-term study of the insurance industry, I have concluded that I hold a mixed relationship with it. On one hand, I feel immersed in the insurance industry and relate to its business activities as a valid and constructive model that makes a contribution to customers and society. I hold this view because I have worked in and with the industry for a long time and also as a product of my deep research engagement with the industry. On the other hand, I feel some disappointment about ways in which the industry lacks the ability to innovate. There often seems to be a lack of both the practice of listening to customers and the willingness to

work in a constructive way with the impact from regulatory changes. I sometimes view industry actors as using more energy to complain about regulations than actually harvesting them as a source of new customer requirements for products, processes and technology. The empirical data in this study have not changed this observation. This adventure into the history of the Swedish life insurance industry has felt like a homecoming, but also as an entry into a new landscape. In the next chapter, I will outline this landscape, the Swedish life insurance industry, as a setting for a major regulatory change that introduced fund-based life insurance to the market.

4. THE SWEDISH LIFE INSURANCE INDUSTRY

To understand what firms do to manage new requirements from regulatory change, this study investigates the behaviour of six companies within the Swedish life insurance industry. Before presenting the regulatory change, in this chapter I provide a brief summary of the industry as background to improve understanding of the firms' actions.

First, I outline the basics of the life insurance business, including key attributes of the products offered, the processes performed, the different customers served and the technology present in the industry. After that, the actors in the industry are depicted, including regulators. This broad overview of the industry landscape will also provide greater understanding of the specific terms and concepts used in the industry. An overview of the history of the Swedish life insurance industry is then presented, including a brief description of each of the eleven main regulatory changes since 1900.[19] This section also reviews current regulatory changes under development and looks at other change factors influencing the industry (primarily mergers and acquisitions and technology). This information provides a context for understanding the regulatory change that led to the actions examined in the case studies. That specific regulatory change—fund-based life insurance—is then explained, with separate empirical data for each of the six selected firms.

4.1 BASICS OF THE LIFE INSURANCE BUSINESS

Life insurance and the business solutions that life insurance companies offer are central to a modern society. Not only do the solutions provide security

[19] A more detailed description of all these changes is found in Appendix C.

for individual customers, but the firms also function as investors and as providers of long-term asset management.

Life insurance supports customers under two scenarios. You may live a long life (which means that you will probably need money to support you in old age) or you may die early (in which case someone else needs your money). Life insurance protects against the risks related to these scenarios by offering the beneficiary a defined stream of income payments. Due to the complex nature of the business and the fact that most customers find it difficult to understand the products and the companies, life insurance firms are under extensive regulatory oversight.

Important factors in the life insurance industry include the type of customers served (private or corporate clients) and how relationships with customers are arranged. Also, the products offered distinguish industry actors from each other. In the Swedish life insurance industry, five to ten companies generally command around 80% of the market. The same actors have been leading the industry for the last 20 years, and several of them have historical antecedents dating back more than 150 years. The industry is a well-defined segment, since all actors are registered and approved to provide their products and services by national authorities and international regulators.

4.2 THE ACTORS IN THE SWEDISH LIFE INSURANCE INDUSTRY

This section describes the main actors in the life insurance industry. Understanding the logic of actors is important since their behaviour or relations between them can change as a result of new regulatory requirements (Ferraro & Gurses, 2009). The most important actors are life insurance companies and independent agents. Also, other actors of relevance are described. Moreover, this description includes a brief account of each major firm and its evolution.

4.2.1 THE LIFE INSURANCE COMPANIES

Eight companies form the core of the Swedish life insurance industry, commanding a vast majority of the market. Skandia, Folksam and Länsförsäkringar are owned by their customers as a mutual insurance company and have insurance as their historical core business. Skandia is a result of a multitude of mergers and acquisitions since 1850. It had a period of international expansion but is now focused on the Nordic market. Folksam arose from collaborations with labour unions, which are represented on the company's boards. Länsförsäkringar is a result of a number of mergers that united regional and local insurance companies; it now represents a collaboration of local and sovereign insurance companies under a common brand name.

SEB, Nordea, Handelsbanken, Swedbank and Danica (part of Danske Bank) are banks with life insurance divisions or subsidiaries. SEB started out as a new life insurance business in 1990; in 1997, it acquired a major operation from Trygg Hansa and thereby became SEB Trygg Liv. Danica and Nordea started their life insurance businesses from scratch. Both of these actors are under influence by their Nordic owners. Swedbank's life insurance operation was set up as a result of an initial collaboration with Folksam; after the two parties realized that there might be competitive difficulties, they agreed to go their separate ways. Handelsbanken acquired the existing actor RKA to form its life insurance operations. It also acquired SPP, which was separated from the occupational pension provider Alecta, but SPP was later sold and is now owned by the Norwegian life insurance firm Storebrand. Alecta and another large provider, AMF, are the primary providers of collective pension solutions for companies and labour entities (through agreements with employers and employee unions). Apart from the specific examples described above, there have been numerous collaborations and partnerships between banks and life insurance companies since 1960.

Whereas these are the main companies in the life insurance market, various other companies exist. Examples are Nordnet and Avanza (Internet stockbrokers with growing life insurance businesses since 2010) and

Movestic (until 2009 part of the investment group Kinnevik under the brand name Moderna Försäkringar, now owned by the UK investment group Chesnara). When these smaller companies are included, the above-described firms control about 95% of the market.

4.2.2 INDEPENDENT AGENTS

Due to a change in regulation (explained below), independent agents have played a prominent role in the Swedish life insurance market since 1990. These agents are either a few large firms, networks of smaller firms in collaboration, small companies or (often) individual professionals. The agents compare the best product and service options for an individual customer or group of customers and propose a solution based on their evaluation. For this effort, the agent receives remuneration in the form of either a sales commission (from the insurance company awarded the business) or a consulting fee (from the customer who requested the evaluation). Large independent agent firms in Sweden include Söderberg & Partners, Aon and Max Matthiessen (now owned by Willis Group), and two networks of agents, Hjerta and Säkra.

4.2.3 OTHER ACTORS OF RELEVANCE

There are other actors in the life insurance industry besides the companies and agents. These actors are involved in the processes that occur after a regulatory change and its corresponding influences on the industry. They include the following:

- Fund and asset managers
- Banks
- Service companies
- Technology providers
- Industry associations

Fund managers manage the different forms of investments backing the life insurance contracts. These actors are further explored in the review of the regulatory change featured in this study, since it opened up possibilities related to their business area.

Banks are intimately involved as owners of several of the new life insurance companies that entered the market after the regulatory change that allowed fund-based life insurance. Both before and after the change, banks have served as important channels for reaching potential customers. Also, banks can support the life insurance industry with asset management.

The service companies have been in the industry since around 1950. Their role was accentuated by regulatory changes and reforms that changed requirements surrounding decisions by life insurance customers. The process of evaluating and selecting life insurance solutions to be contained in collective agreements between business and labour is the responsibility of these units.

Technology providers support the industry with applications and systems for managing life insurance contracts. Numerous national and global insurance system providers populate the market. One important role of these firms is to analyse and interpret regulatory requirements and implement them with solutions that are suitable for the market. This role is visible in the case of the new EU regulation Solvency 2.

Finally, industry associations function as a link to regulations and regulators. They increasingly participate in communication with developments in the EU and are active in formulating points of view on behalf of the entire industry towards the regulatory bodies.

4.3 THE REGULATORS OF THE LIFE INSURANCE INDUSTRY

Understanding of the role of regulators is vital in order to grasp the context of changes in regulations. The main regulator of Swedish life insurance is the financial market supervisor (Finansinspektionen). From 1904 until 1991 there was a separate insurance supervisor (Försäkringsinspektionen), which was then merged with its equivalent in the banking industry

(Bankinspektionen). The reason for this merger was the escalating connections and blurring of boundaries between the products and processes of banks and insurance companies. Finansinspektionen (FI) now has organizational units responsible for insurance, bank and financial markets separately.[20]

The increasing globalization of the financial services industry also impacts the development of regulations for the life insurance industry. Several current initiatives are now based on common work within the European Union under the umbrella of the European Insurance and Occupational Pension Authority (EIOPA), which issues overall frameworks governing the EU. FI is then responsible for approving products before they can be sold to customers in Sweden and for overseeing the management of the companies authorized to sell life insurance in the Swedish market. Oversight of life insurance firms includes processes to ensure that their capital and solvency levels remain appropriate. Regulators tend to emphasize the importance of products as implementations of the life insurance business logic. Even though life insurance is part of a services industry (i.e. financial services), the main realization of the promise to customers (growth of savings or pay-out of financial support) comes in the form of a defined product.

4.4 THE CUSTOMERS OF LIFE INSURANCE

The different customers of life insurance firms and how these relationships are arranged can be of interest, as interfaces can change as the result of a regulatory change. As noted previously, customers want to assure themselves of solutions for two cases: living a long life and dying early. There are two main groups of buyers of life insurance: individuals and (because of the existence of collective arrangements between business owners and labour) corporations.

[20] See the Finansinspeltionen website, www.fi.se/Om-FI/Organisation/, accessed October 21, 2015.

4.4.1 INDIVIDUAL CUSTOMERS

Individuals buy life insurance for two reasons. The first is to increase one's security by supplementing the state pension with a buffer of own savings. The second reason is a tax incentive. Buyers frequently seek to move tax payments from today to a future date when they expect to have a lower income and therefore a lower tax rate.[21] Security issues can also include providing for supplemental support should life conditions change due to illness or accidents. Attractiveness for individual investments in life insurance depends on the level of support available from state and corporate pensions.

4.4.2 CORPORATIONS BUYING LIFE INSURANCE FOR THEIR EMPLOYEES

Companies buy life insurance for the purpose of providing a benefit to their employees. Life insurance may be a fringe benefit included in the employment agreement package. Some industries have collective agreements mandating that companies offer life insurance solutions to their employees. The industry segment of corporations as customers for life insurance (also called corporate pensions or occupational pensions) has gone through a number of changes over the last 50 years. These changes are related to both the evolution of the state pension system and changes in the actors within this system.

4.4.3 RELATIONSHIPS OF LIFE INSURANCE FIRMS WITH THEIR CUSTOMERS

Depending on the relationship with the customer, life insurance products are offered directly to customers or via various intermediary channels, which can be directly under the life insurance company's control or independent. The direct relationships take place via personal meetings (at either the

[21] At the present time, this tax incentive is close to zero, but over time it has been a significant incentive.

company office or the customer's home), telephone contact or the Internet. Intermediary channels include corporate human resources and finance departments (where usually the company is the formal owner of the life insurance contract), independent agents (who are obliged to be neutral and work for different life insurance providers) and financial advisors (who can be dedicated to just one company).

The gradual increase in the complexity of relationships and products triggered actions among the parties in the labour market to lower costs in the value chain and to simplify the decision process for customers. Around 2005, the role of the appointed service companies (Valcentraler) was strengthened. These organizations had been involved in the market since the 1960s.

4.5 LIFE INSURANCE PRODUCTS

Understanding the products provided by life insurance firms is central to grasping the dynamics of the life insurance industry. Through these products, the industry's functionality is made visible. Two product areas dominate the industry: (1) life insurance with guarantees and a bonus participation and (2) fund-linked insurance with variable investments selected by the customer. The former products consist of one part to cover for unexpected events (e.g. death, unemployment and disability) and another part consisting of the savings capital. The asset managers of the life insurance company control the capital. These managers decide whether the company will invest in shares, bonds or real estate, and they do so on behalf of the entire customer base. Until 1990, there were very limited options for the customer to select a savings type, and the return on assets was close to equal for all customers of any company.

From 1990 onward, products with variable returns could be offered to customers. In this new market, the insurance companies selected different funds among which the customer could choose. These changes in the products available transformed the way in which life insurance was offered and delivered. Now, in fundamental terms, a life insurance product consisted of two main elements: risk coverage and savings choice.

4.5.1 RISK COVERAGE

Risk coverage in a life insurance product entails covering the customer's risk of events that have a low probability of occurring but major impact when they do occur. Such events include death, unemployment and disability. Depending on the calculated likelihood of such events, the customer pays a price in exchange for the promise of defined benefits should the event occur. The probability that the event will take place is calculated by using industry-wide and firm-specific statistics. The result is then applied to the particular circumstances in which the product is provided (e.g. the customer's age, occupation and geographical location). Risk functionality can be provided as a stand-alone product (e.g. a pure death benefit policy that pays a specified amount to the beneficiary defined) or integrated in a combined solution with a savings choice.

4.5.2 SAVINGS CHOICE

The savings choice in a life insurance product consists of the capital supporting long-term income generation for the customer. The accumulated capital will grow and generate a return on investment. Managing capital in the life insurance context can be approached in two ways; central asset management or customer selection of investments.

In the former case, the asset managers of the life insurance company control the capital and decide whether the capital will be invested in stocks, bonds or real estate. Here, the return on assets is calculated for the entire customer base as a common return on assets, which is then allocated equally to all customer accounts. The return consists of two parts: the guaranteed interest (a pre-defined rate that depends on the interest level at the issue of contract) and the bonus participation (which can vary depending on the real return of the investment portfolio over time).

Under the second option, the insurance company selects different funds from which the customer can choose. These funds have to be registered investment funds under authority supervision. Each life insurance company determines the range of funds available to its customers. The customer can then move the capital between these funds as he or she wishes. There is no

guarantee regarding the final investment return, as it varies depending on the result of the individual funds' performance. Two variations of this basic design exist today. In one of them, the customer has full freedom to decide which assets are included in the capital (i.e. it can be other instruments than regulated investment funds); in the other, pre-defined packages of securities (usually funds) are created to correspond to customer needs, such as packages with low, medium or high risk or age-defined funds (e.g. a generational fund for people born in the 1960s). All these options and versions have evolved over time and are now provided by most actors in the industry.

4.6 LIFE INSURANCE PROCESSES

Since life insurance is a form of financial services, processes constitute an important aspect of the delivery of the products to customers. This section describes the main steps of an end-to-end process performed by a life insurance company. The overall business process starts with product development.

4.6.1 PRODUCT DEVELOPMENT

Even if the life insurance industry is considered a service business, the focus on developing and designing products is strong. A legacy of product focus can be seen both in how regulators view life insurance (as their main activity is the monitoring and analysis of products) and in how life insurance companies are organized. The process of developing a product includes the mathematical calculations to determine price levels for savings and risk components as well as construction of the features to be offered to the customer. The development of products is also aligned with how the product is intended to reach the end customer, as well as with the channels for sales and advice.

4.6.2 SALES AND ADVICE

Since life insurance is a relatively complicated product and service for which customers seldom search actively on their own, the need for a process supporting advice and sales of these products is paramount. These processes are sometimes grouped together under the concept of distribution processes. They include how to inform people about products, how to guide customers to the right choice and how to combine different products into a suitable solution offering for an individual customer. The different distribution channels used are described further in 4.4.3.

4.6.3 ADMINISTRATIVE SERVICE PROCESSES

Once the contract for a product has been signed and is registered as a live agreement, there is an on-going need to support these arrangements in an array of ways. Regular service events stipulated by the agreement between a customer and a life insurance firm can involve account statement reporting, tax calculations and queries regarding the customer's family situation. The customer may request changes (in either the risk or savings aspects), such as increased or decreased death coverage, a new beneficiary or different investments. Service processes are also required for receiving payments and for managing the withdrawal of funds. Hence, a multitude of service transactions are related to the functions fulfilled by life insurance products.

4.6.4 INVESTMENT AND ASSET MANAGEMENT

One fundamental process of crucial importance to life insurance companies is investment and asset management. The design of this process depends on the product design. It can involve either the administrative processing of trading in investment funds or the elaborate responsibility of evaluating and selecting direct investments to provide for a solid return on assets. The process entails making investment decisions based on the potential returns of different classes of assets and of specific securities within each class. In addition, the life insurance company needs to consider maintaining a good match of duration between the assets on the books and the commitments to

make payments to customers. The range of duration can be from immediate availability to a promise to pay a guaranteed return over e.g. 30 years.

4.6.5 RISK MANAGEMENT

Life insurance is at its core a matter of evaluating and assuming risk, which is managed on the principle of collective risk sharing. Therefore, processes first consider individual risks (e.g. the likelihood that a particular person may die in a certain time period). Second, risks are considered on a group basis (e.g. what percentage of men age 50 to 60 will die in the next 10 years). Also, risk in investments and in operations is managed. In this context, well-established risk management processes are needed. Firms' responsibilities have been further articulated in recent regulatory changes, but risk management has been at the centre of life insurance company regulators' attention for the last 100 years.

4.7 TECHNOLOGY IN THE LIFE INSURANCE INDUSTRY

The life insurance industry has been an early adopter of new technology, such as the mainframe and associated technology platforms. Since the years of mainframe implementation, the main technological force to impact the Swedish life insurance industry has been Internet technology, which has led to the implementation of a common industry-sponsored pension account maintenance portal (minpension.se). Through this portal, individual customers access their life insurance account information. In addition, the development of sophisticated security solutions (such as Bank ID, a common Swedish technology solution for digital identification) and the gradual evolution of mobile access to information have increased the degree of interactivity with an industry that historically has been a low-frequency relationship business.

4.8 MERGERS AND ACQUISITIONS

To contribute further to the context of regulatory evolution in Sweden, I will briefly address how mergers and acquisitions have impacted the life

insurance industry. This information is important because of the present study's intent to isolate the effect of regulatory changes from other factors over a long time period (for a similar argument about concurrent forces of change, see Bergek et al., 2012).

Mergers and acquisitions have significantly impacted the Swedish life insurance industry. A brief list of key events follows.

- 1900 to 1950: a long list of mergers and acquisitions took place, resulting in two major groups being formed: Trygg Hansa and Skandia. In addition Folksam was founded based on mergers.
- 1990: Handelsbanken acquires the business of RKA (Ränte- och Kapitalanstalten) to establish a foothold in the life insurance market.
- 1997: SEB acquires the life insurance division of Trygg Hansa, combining it with SEB's own life insurance division to form SEB Trygg Liv.
- 1998: a merger between Länsföräkringar and Wasa took place. Wasa was in turn the result of a merger between four companies in 1985 (Valand, Vegete, Skånska Brand and Allmänna Brand).
- SPP was formed in 1917 as a collective pension provider. The name means Sveriges Privatanställdas Pensionskassa (Pension Fund of Private Employees). From 1991 to 1994, SPP collaborated with Trygg Hansa in a common group. After SPP's split from Alecta and Collectum in 2000, Handelsbanken acquired the company. In 2007, Handelsbanken sold it again to the Norwegian life insurance company Storebrand.
- Folksam collaborated with Swedbank in two companies, Sparfond (fund-based life insurance) and Sparliv (life insurance with guarantee). The collaboration was broken up in 1995. Folksam has made subsequent acquisitions of Förenade Liv (2001), KPA (2010) and Salus Ansvar (2012).

The impact of these numerous mergers and acquisitions are kept in mind when assessing the pure impact of regulatory change, and particularly in our upcoming analysis of the most radical change in the history of the Swedish life insurance industry: the fund-based life insurance regulation introduced in 1990.

4.9 HISTORICAL EVOLUTION OF THE INDUSTRY

This thesis presents the study of one particular regulatory change. To better understand the context of this particular change, the historical evolution of the industry will be briefly summarized in this section.

The evolution of the Swedish life insurance industry can be viewed as beginning in 1903, when the first proper insurance law was implemented, although life insurance companies had existed long before that time. As far back as 1740, organizations had been established to provide support for widows and children of deceased state civil servants (e.g. Allmänna Änke- och Pupillkassan, a firm still active today).

The industry's continuing development up to the present time has involved increasing layers of relationships and actors, both internally and also in relation to other industries and institutions. The number of product choices (funds and other forms of savings) has increased exponentially. Meanwhile, reforms in the public pension system have changed the way in which life insurance industry actors offered their solutions. Several moves by labour market actors influenced the ways in which life insurance products were packaged and distributed. Product evolution generated an escalating range of choices for the end customer, who had to evaluate thousands of investment options and consider information from several different actors. As noted, the greatest change in the modern history of this industry in Sweden was the introduction of the fund-based life insurance regulation in 1990, which led to the creation of new products and processes. Key aspects of the industry's historical evolution are summarized in Figure 10.

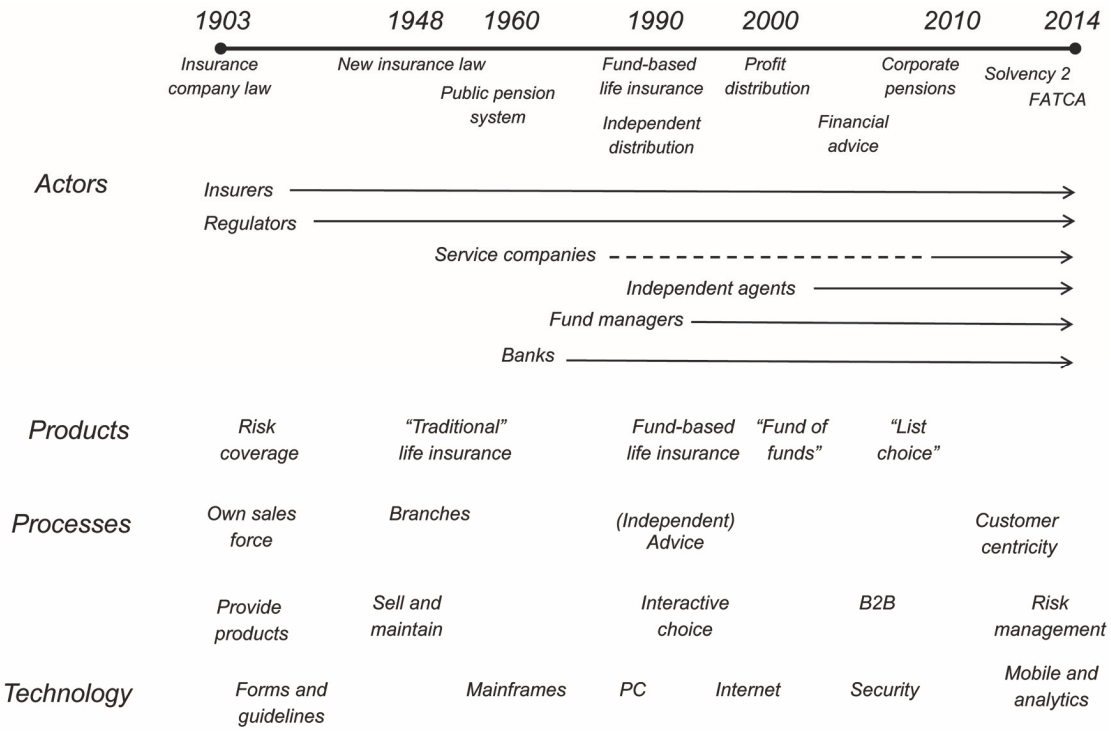

Figure 10. The historical evolution of the Swedish life insurance industry

5. THE FUND-BASED LIFE INSURANCE REGULATION

The fund-based life insurance regulation has been selected for study in this thesis because of its significant effects on the industry and its actors. This regulatory change, introduced in 1990, created a situation typified by new products, new firm constellations and new firms.

In this chapter, the overall industry context and implications of the new regulation will first be outlined. Then each of the six case-study firms and their actions in the wake of the regulatory change will be described. Statements by industry actors are inserted to illustrate selected key issues.[22]

The fund-based life insurance regulation was the most radical change in the history of the Swedish life insurance industry.[23] It created an entirely new set of businesses and changed broad aspects of how companies executed their business. In a relatively short time, it drastically restructured a market that had been operating in essentially the same way since 1948.

"Fund-based life insurance is the Formula One of the life insurance industry." – Journalist, Expressen

The regulatory change opened up opportunities for new products and new collaboration arrangements offering new processes and services. Customer options were also multiplied from "one size fits all" to several different ways of selecting and designing product content to suit each individual customer.

"This is the life insurance equivalent of a candy bag." –CEO, Beta

[22] The quoted statements in boxes are direct translations from comments made in interviews or found in my resaerch.

[23] This view was confirmed by both experts in the industry and consultants with industry insight. It can also be observed in how new actors entered the industry and new entities were created.

The regulation was introduced at a time when the Swedish life insurance industry was perceived as lagging behind other countries in development and as less efficient that its counterparts in other countries with a mature insurance sector (e.g. the UK). It was deemed appropriate to inject greater competition into the industry, both within existing players and from international life insurance providers and other industries (primarily banking and fund management). After the introduction of the new regulation, the Swedish life insurance industry experienced a radical change in structure, in the nature of offerings and in the relations between actors (see Figure 11).

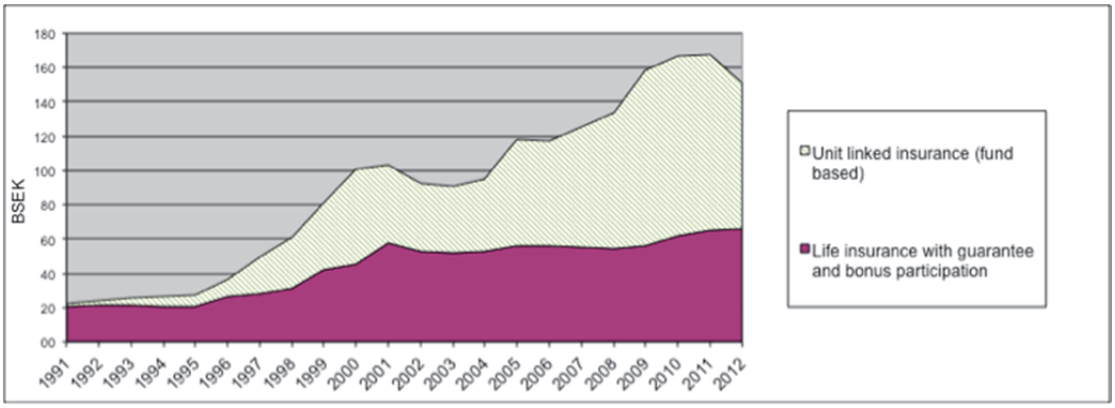

Figure 11. Relative growth of fund-based life insurance and traditional products with guarantees in Sweden

5.1 THE CONTEXT OF THE REGULATORY CHANGE

In the 1980s, customer requirements changed in such a way as to affect both banks and insurance companies. The main desires were for increased flexibility and more options to gain higher returns on saved capital. This force motivated the Swedish finance ministry and insurance supervisor to formulate a new regulation: the law of fund-linked life insurances, launched in 1990.

The industry evolution preceding the new regulation involved political processes, changes in market conditions, customer demands and actions by firms as well as industry associations. Even though the change in regulations was generally seen as favourable for the industry, not all firms were fully

positive about it. The tax incentives offered for fund savings in Sweden at that time had led to increased popularity of such investments, gradually putting demands on the insurance market to launch new products. The increased connections between banks and insurance companies (also called "bancassurance") in international markets influenced Swedish actors in a market that had seen little change since the last major insurance regulation, enacted in 1948.

The regulatory change also coincided with the development of a new pension system, which in the debate on its adoption was forecasted to provide lower pensions for many. Hence, in cases where the state could not pay a full pension, there was an emerging need for modern and flexible products from private firms. In this historical context, the competition with similar products on the market was characterized as "the war of bonus returns" in the 1980s, as the most important performance measure in the market's eyes was the return on assets under management.

"The traditional life insurance companies are being discredited due to their inability to fulfil promises. This creates opportunities for fund-based business." –Journalist, Dagens Nyheter

One difference between the traditional forms of life insurance and the new fund-based business was the different solvency requirements. The amount of capital required for the new type of business was only 1%, as opposed to 4% for life insurance providing a guarantee. The difference was due to the lower risk content of the new products. Only a minimum insurance risk was needed in order for the products to be identified as life insurance.

"The Swedish life insurance industry is close to a bureaucracy, static and undeveloped, to the disadvantage of the Swedish consumer." –Comment in a regulatory proposal from the Swedish government's Finance Department

Even if the changes evolving from the new regulation were radical in nature, the idea was not entirely new. One company had already suggested in 1959 a new product called "share life insurance". This product would combine the security of a traditional life insurance product with the

possibility of making growth-oriented investments in the stock market. A similar concept was proposed by an alliance between an insurance company, savings banks and a fund management company in 1966. Moreover, similar solutions were already available in other markets such as the UK and US. Also, Germany and Japan had seen initiatives to launch products with limited guarantees and more growth potential for the customer by means of investments in the stock market. Due to the influence from other global markets, the need for international partnerships came into focus for the participants seeking to perform successfully in the new post-regulation industry.

Until 1990, the Swedish life insurance industry was quite stable, with a few firms accounting for 60% to 85% of the entire market for the previous 40 years. With the introduction of the new regulation, a new industry emerged. Banks diversifying into the life insurance segment joined the incumbent insurance companies. The remaining 15% to 40% of the market was made up of smaller niche firms with a limited product portfolio, often associated with specific product segments or serving a regional market. The winners and losers in the new insurance segment over time included both incumbents and new entrants. The new law had fundamental implications for the investment of life insurance capital assets. Under the former system, only one option existed for asset management. With the new regulation, insurance companies could offer a larger selection of investment funds linked to insurance products. The new products were handled separately from previous life insurance businesses, and this separation had clear effects on calculating fees, solvency requirements and principles for taxation. All this marked a fundamental departure from the old regime, characterized by control over a company's own resources, including asset management, sales force, offices and IT systems.

The core difference introduced in the 1990 regulation concerned rules for asset and fund management. Before the new regulation, each life insurance company provided asset and fund management internally. The new regulation permitted external and even international selections of funds from other providers to be linked to the life insurance agreement (the calculated units of the funds giving rise to the name applied in the UK

market, "unit-linked life insurance"). The offerings built into the products hence shifted from pure internal to greater external influence, and also the number of funds available on the market gradually increased (see Table 5).

Table 5. Funds offered in products within the Swedish life insurance industry after the regulatory change

Year	Total number of funds offered	Percentage offered by external providers
1991	68	0%
1992	86	14%
1993	99	24%
1995	120	31%
1997	138	38%

This transformation caused the life insurance industry's focus to shift from asset management to encompass fund management and evaluation of funds. Over time, impact on distribution processes, product marketing and the relationships required to perform these tasks was also visible. The change from asset management to fund management introduced new relationships. Before the regulation, products were marketed and sold by the company's own sales forces, which promoted internal asset management. More options and wider product portfolios from external providers called for complementary knowledge from external fund managers to provide content and data underlying the product investments. The new regulation made it possible for life insurance firms to consider open fund management provider strategies, as opposed to their previous work with only their own asset management resources.

As the landscape became more complex, independent financial advisors and agents joined the industry. These agents had different roles. Some specialized in the investment side of the products, like Wassum and Morningstar, who supported the life insurance companies through their relationships with fund managers and helped to educate sales and service employees on investment topics. Other agents (like Max Matthiessen, Säkra

and later Söderberg & Partners) who had a background in the life insurance business put most of their effort into risk coverage optimization and tax arbitrage calculations, and over time they also introduced advising on investment management matters.

"This is like being in an amusement park. It is exciting, but the ride goes up as well as down." –Journalist, Dagens Nyheter

To handle new and more complex relationships, new investments in service processes were required. The affected areas included analysis, reconciliation, trading and reporting of the required number of units in investment funds. Insurance companies are required by regulators and owners to manage risk appropriately, and therefore processes for monitoring the balance between the firm's investments and the allocation of customer funds were established to ensure that the correct actions were performed on a daily basis. These actions were required to avoid a mismatch on the insurance company's balance sheet. Previously, such detailed analyses were made with much less frequency (usually monthly or quarterly), since the firms had discretion over their exact allocation of assets and in which specific securities the capital was held. For the new products, a daily and precise view of the investment allocation for all customers had to be reported, and the corresponding trading of fund units had to be made. Several firms were not executing trades of fund units with the appropriate timing for their insurance contracts. As a result, financial losses occurred (because the firm did not own the units that the client had ordered) and the financial supervisor issued reprimands and fines.

The need to implement the control of ownership of assets and corresponding registers highlighted the way in which the new regulation had combined two different models: risk management and asset management. In the new mixed model, the investment business was focused on administration and the insurance side was about selling. Even though both processes had been in place previously, there was a need for integration between asset and fund management, along with a need to understand new processes of risk management.

One inherently complex process was the calculation of taxes within the product design. There were seven different models for calculating the tax charges on products. It was difficult to customers to make comparisons if they wanted to move between life insurance providers. The products offered were very flexible (it was possible to make fund trades every day if desired, but most customers did not use this flexibility.

The gradual influx of new technologies such as call centres and the Internet increased customers' demands for cheap and quick service. The introduction of new technologies also opened up possibilities for customers to make changes directly in their fund selection. Administration systems had to be adjusted to permit such flexibility, highlighting the importance of IT systems to calculate prices and register accounts as well as the relationship between IT systems and product design. IT creates efficiencies, but the design of IT systems can limit options for new products. Hence, the role, evolution and adoption of technology were central in firms' actions after the regulatory change.

The evolution of products, increased choices and the new landscape of providers placed an intense focus on information management and especially information delivery to customers. As customers generally lacked sophistication with regard to life insurance, the need for customer communication increased. Information transparency improved because of new regulatory requirements (e.g. regarding the company's financial status). Firms invested in linked initiatives in advertising and communication. On some topics, however, such as the multiple different models for calculating tax charges on products, lack of transparency and information persisted, making customer understanding of different options on the market exceedingly difficult.

Having depicted how this regulatory change reshaped the industry, I will now turn to the actions of each firm featured in the case studies. One at a time, I will explain how the firms were impacted and what they did in the wake of the regulatory change. Reflections by respondents and other sources will be used to illustrate specific actions.

5.2 THE ACTIONS OF THE FIRMS IMPLEMENTING NEW REQUIREMENTS

This section will describe the specific actions of the case-study firms within the context of the change introducing the fund life insurance regulation. The actions are derived from the accounts presented by knowledgeable respondents through interviews and in published or archival documents. The descriptions are organized in accordance with patterns emerging from the empirical data. The summary of each firm's actions is related to the dimensions of the theoretical framework, but explicit links to theory will be made in the analysis chapter. Each case description ends with an illustrative action that point to the specific characteristics of that firm's activity. At the end of the chapter, general characteristics of the firms' behaviour will be further described so as to provide an enlightening overall perspective.

5.3 BETA: LOOKING FOR NEW PRODUCT COMBINATIONS

Beta had a high level of market success, both by emerging early and then by sustaining its competitive position. Beta was proactive in its relationship with regulators and also moved quickly to contemplate the needed implementation actions arising from the regulatory change. Beta was active in establishing arrangements with external providers and in linking existing and new products, processes and technology.

5.3.1 PROACTIVE IN PRODUCT IMPLEMENTATION

Beta had a legacy of insight into the topic of the new regulation, dating back to the late 1950s when it attempted product development for a similar solution. As the regulatory implementation process evolved, Beta was seen as active with legislators for understanding actions and as developing relationships and an on-going dialogue with the employees at the regulatory agency. The discussion topics included specific items such as tax calculations. Two separate initiatives in separate business units at Beta were merged to manage the impact of the change. Another potential advantage for Beta was its process of collaboration within the merger and acquisition

talks that it held with another firm in 1990. In connection with these merger discussions, both firms engaged in detailed discussions concerning products, processes and technology. Beta´s preparations for the new regulation were improved by its understanding of both the insurance and banking aspect of the new business.

Beta was a proactive proponent after the regulatory change, both facilitating contacts between regulators and the companies in the market and making direct contact with the persons at the regulatory agency who would be responsible for supervising implementation.

"We found out who was writing the regulatory text and started a dialogue with him. They were considering how this regulation would look." –Business development manager, Beta

5.3.2 PRODUCTS INCLUDING EXTERNAL PROVIDERS

Beta was the only firm that took a radical approach to changing its products. Beta decided to introduce external providers, resulting in the need to change the process of fund selection. It also introduced a large range of new funds, which provided challenges in terms of product design.

Considerations of the impact on products encompassed the areas of product design, the product development process, product and fund range selection, impact on IT systems and platforms, creation of combination products, and the balancing of the new product offer with existing products for both its sales force and customers. Product design involved the general setup of products and ties between involved components. Technical details and complexity were observed, e.g. through errors occurring in mathematical calculation formulas and details of the implementation of tax calculations. A focus on technical tax issues was central to Beta's actions.

The product development process was influenced by the need for new components and new partners. This development highlighted the potential to limit customer flexibility in using the product (i.e. to change the allocation of funds) since heavy use of such flexibility would create high costs for Beta. The balance was challenging, since the main rationale for promoting the new products was the increase in customer flexibility, especially the possibility of changing fund allocations. The product and the corresponding

fund range were important focus areas for Beta. By implementing a fund range selection process and an articulated independent fund strategy, Beta was for a long time the only actor in the market making these offers to customers.

Beta decided early on to introduce external providers, resulting in the need to change the process of fund selection. Two actions were required: establishing funds provider relationships and implementing a fund range selection process. Fund provider relationships required a choice between an open and a closed architecture. Should the products be open to any provider, or should a quality assurance process be established? Beta chose the latter course of action. The topic of fund range selection became an additional process in decisions on the specific types of funds and how they related to the entire offer within the product. The implications for Beta were the introduction of a range of new interfaces, with suppliers and other actors supporting the evaluation.

"The competitors launched half-hearted solutions with their own funds. What was then the difference from what was already offered?" -Business development manager, Beta

At the outset of the regulatory change, Beta was offering 11 different funds, the second-largest set of options in the market. After two years, Beta had a broader fund range than any other competitor, representing 30% of the total number of funds offered by the eight firms in the market). Between years three and seven after the new regulation, Beta provided 40% of the total number of funds on the market, and until 1997 it was the only firm offering external funds in its products.[24]

"We were independent, the concept of multimanager was new and we had a selection process. We had chosen from 10,000 funds and you could change funds at any time without a fuss." –CIO, Beta

[24] These data and parallel information on the other firms are based on fund price information in *Svenska Dagbladet* (a major Swedish daily newspaper) from 1991 to 1997.

Beta also ventured into the creation of combination products (i.e. combining fund-based insurance and the traditional business with guarantees). These combinations implied additional technology, process and distribution development, creating links between two sets of product offerings. A relationship had to be created with the existing business, which operated as an associated but independent business unit. These combination products were created to balance the new product offers with existing products for the sales force, and also to help salespeople to balance the offer towards customers.

Beta made a concerted effort to focus on regular premium products (where the customers agree to a longer period of savings, at least 5 or 10 years). In doing so, Beta sought to create a balance between the cost to the customer and competitive remuneration for both their own and external sales resources. As a result, tensions in the sales channel over remuneration could be resolved and Beta's market position improved significantly.

"When we constructed products with a duration of 5 to 10 years, we could offer remuneration to the sales channel and it became cheaper for the customer. In this way we caught up with Kappa." –Business development manager, Beta

5.3.3 PROCESSES FOR EXTERNAL DISTRIBUTION TO SELL AND INTERNAL TO ADVICE

The changes in products placed demands on the distribution and customer relationships, since the organization responsible for these processes had to manage a more diverse set of customer offerings. The increased variety and number of performance attributes introduced into the products influenced distribution strategies. Beta introduced independent agent distribution as a vital aspect of its distribution and product strategy, combining the external use of product providers with external agents and brokers managing the customer relationships.

The new products introduced greater options for customers in the form of increased flexibility. A central topic in the relationship process was to balance customer flexibility in using the products with customer satisfaction through giving customers virtually direct access to product calculations and

functionality. This increased access to product functionality also put additional demands on Beta to secure its information quality, as well as to educate customers through advertising and marketing.

Balancing a new product offer with existing solutions was also an issue for the sales force and distribution channels. For the sales force, balancing a new product offer towards customers created tensions. How would different distribution channels be rewarded for sales and administration of new and existing business? These questions required actions related to the design of the distribution processes. Intense efforts were launched to improve understanding of the new products. In partnership with its fund managers (the external providers) Beta launched an education and information road show. The broader issue of sales force management, including the relationship with distribution channels and the construction of remuneration models came along with this new complexity. The increased variety and number of performance attributes introduced into the products influenced the service processes and customer relationships. Among the service processes that experienced changes were fund trading, asset and fund management and tax calculations. These changes required new training initiatives and education of both employees and customers. Customer relationships were also addressed through communication and advertising efforts, which were performed in collaboration with the external providers (of both products and processes).

5.3.4 COMBINING ASSET MANAGEMENT AND FUND MANAGEMENT PROCESSES

For Beta, a crucial step in the realm of service processes was the move to perform both asset and fund management. Asset management had historically meant management of a single pool of investments on behalf of all clients. At the end of the year, a bonus return was given to all customers in the pool. In contrast, fund management introduced the process of daily fund trading. The difficulty of executing a new process is displayed by the fact that Beta was subject to a market timing investigation, because regulators were not certain that Beta had bought and sold fund units at the

correct time. Such precision concerning speed and timing was not required prior to the regulatory change. The additional process of calculating unit prices, including tax calculations, required balancing the allocation of the company's own fund units and those owned by customers.

In addition, the integration of asset and fund management was attempted. Beta had a particular challenge here with regard to asset management strategy, involving a fund selection process, since it had opted for a partly external set of fund supply sources. As a result, a radically different process of selecting investment assets was implemented. Customers' direct access to product calculations also compelled establishment of new processes. Risk management, a core process for Beta, was further developed due to the new integration points introduced.

5.3.5 TECHNOLOGY FOR INTERNAL AND EXTERNAL PROCESSES

The impacts on IT systems and platforms required Beta to consider new technology. The (narrow) product focus of IT systems was mentioned as a potential challenge in responding to the regulation, since other aspects were considered less important.

The technology needed to integrate with external providers also required more flexibility than a pure internal supply chain entailed. Beta distinguished two main dimensions of technology: IT systems and IT platforms. The former are the applications (which combined some purchased and internally developed solutions) that support the products and processes, whereas the latter constitutes the basis enabling these applications to function. IT systems are specialized applications for different functional areas, such as fund trading, insurance account management and sales remuneration. The platforms could be common or specialized, and some existing platforms could be applied towards addressing the new regulatory requirements. Both IT systems and IT platforms were supporting blocks for product development. The IT systems impact was significant due to the changes in product design and fund supply, with which the existing IT systems were not compatible. Carrying out the necessary technology

modifications can be a challenge for an incumbent firm like Beta. A key task, due to the changing flexibility requirements, was to follow the technological evolution and make decisions on what to make or buy. For its new solutions, Beta decided to use mainly internal IT by developing its own system for insurance contract administration. The only external provision of an IT system was for fund management.

"We were starting in good time, and had the time to consider properly the business model, product offerings and supporting systems. The others (except Kappa) were more ambivalent and probably wished the change would not happen." –Business development manager, Beta

5.3.6 SUMMARY OF BETA'S IMPLEMENTATION ACTIONS

Beta pursued implementation of the regulatory change as a central element of gaining competitive advantage. Products and processes were designed with significant support from external providers, and linkages were formed between new and existing products and processes. Technology was developed and integrated using mainly internal providers.

Illustrative example: Beta's decision to have external fund providers

We decided to have independent funds. This was a very conscious decision. The consumers with small amounts of money to invest could not access the exclusive fund managers (like JP Morgan and Fidelity) at this time. The fund managers did not have the processes to handle small private clients. We offered them a channel through our products. Our own asset management unit thought this was unnecessary. They said, "We can establish these funds … one for the USA, one for Europe, etc." We persisted in using external partners. There were many hard discussions on this topic.

–From an interview with Beta's business development manager

5.4 ALPHA: NURTURING CUSTOMER PROCESSES

Alpha had a lower level of market success. It entered late and hence took longer to develop successful offerings.

5.4.1 CAREFULNESS IN PRODUCT IMPLEMENTATION

Alpha's new products were relatively marginal innovations when compared to previous products. In its product strategy, there was a need to align with corresponding distribution strategies to support the new products being developed. Alpha struggled with how to balance the product assortment (or portfolio). Concerns were voiced regarding the effect that the new fund-linked insurance solutions would have on the traditional business (with guarantees). Alpha´s own perception was that it had established a product assortment that was too narrow to be competitive in the market.

> *"Alpha missed out concerning the new products earlier. We had a too limited product assortment. When you think about it, the need for complementary life insurance is largest among the groups who are living with small margins." –CEO, Alpha*

At the outset of the regulatory change, Alpha offered eight different funds (an average level of variety) and this offering remained stable for the coming seven years.

The fund selection process had a pure internal focus in order to obtain balance in the product and fund range. One focus area was in product repackaging, which had two notable aspects. The first was the marketing of pre-arranged packages for investment choice (so-called "fund in fund"), where the customer does not choose the exact funds but only decides on the risk level. The second aspect was the development of combination products, in which the traditional guarantee solutions would be mixed with the new, flexible products. These activities were needed to balance the availability and complexity of the fund choice process with individual customers' need for flexibility. Due to the pension reform also taking place, the topic of an extended fund range was raised, which also had implications for customer support skills. The risk foreseen here was that in the end the customer would have an infinite number of choices and would not be readily able to make any choice.

Eventually, product repackaging was attempted by creating "fund in fund" products where existing products were re-applied to a new solution from a common platform, along with combination products that mixed the

core fund-based life insurance with other functionality such as health and risk insurance. Alpha's strategic tendency was to consider how to limit customer flexibility in using the new products. Specific worries were articulated regarding the risk that capital would decrease in value when the stock market went down. Customers would want a safe solution in turbulent times and the possibility of an upside in good times. Hence, Alpha integrated its existing and new products only in a limited way.

5.4.2 EMPHASIS ON CUSTOMER RELATIONSHIP PROCESSES

Among the six firms examined, Alpha had the deepest concern for enhancing customers' knowledge so that they could understand the new products' functionality. The firm's standpoint with regard to launching fund-based solutions was coloured by a strong focus on its relationship with customers and on the company´s position as a contributor to society, not only on making profits. Therefore, the requirements from the new regulation and the subsequent evolution towards a broader fund range were directly incorporated into Alpha´s customer support services, to guide customers in interpreting and considering use of the new functionality offered. The firm carefully considered potential impact to the customer base before settling on an implementation solution. Alpha´s entry into the market included a period of collaboration with another firm in a joint company. This collaboration was eventually terminated, however, due to increased competitive conflict.

5.4.3 A PROCESS FOR CUSTOMERS TO UNDERSTAND THE NEW PRODUCTS

The distribution aspects of the new products influenced Alpha in terms of the link between distribution and product strategies. New distribution models were needed based on this new distribution strategy. New sales channels that could handle the increased complexity in the fund choice process in relation to identified customer needs were established. Telephone and direct marketing channels were used, and Alpha pursued limited developments of relationships with independent agents. One specific issue

for Alpha was the lack of benefiting from links between banking and insurance businesses. Alpha had no banking channels, and the new fund-based solutions included investment choices normally associated with a banking business. Alpha interviewees noted the challenge involved in balancing product innovation and the ability to sell through existing or new customer relationships. This balancing included attempts to limit customer flexibility in using products, both to enhance customer understanding and also to manage service costs. This requirement was a result of the market drive for increased fund range selection and the corresponding implications for customer support processes.

The explicit link between service processes and distribution processes is apparent in Alpha's experience. The balance between product innovation and the ability to sell these products challenged this link, as did the need to relate banking and insurance businesses. Alpha's strength in risk management had to be extended to also handle investment risk and capital market savings issues.

5.4.4 INVESTING IN NEW AND EXISTING TECHNOLOGY

Alpha had historically been active in applying new technology in support of products and processes as well as customer relationships. Considerations of new functionality related to the introduction of fund-based life insurance had implications for technology. One role of technology was to transfer resource allocation from administrative work into more selling activities.

The technology platform needed to be updated, due to the new functionality introduced. This change influenced the entire technology infrastructure, entailing significant IT investments. IT was used mainly to lower operating costs and to decrease lead-time in service and product development. The new technology required was developed internally and integrated with the existing systems and platforms. Alpha had a history of considering the interfaces between existing and new technology supporting both products and processes.

5.4.5 SUMMARY OF ALPHA'S IMPLEMENTATION ACTIONS

Alpha was active early but also experienced hesitation regarding implementation of the requirements from the regulatory change, because it was constrained by existing business and related products as well as the company's relationship to their customers. Integration of new and existing solutions was limited by these constraints, and limited use of external providers was noted. Technology was developed by internal sources and applied to facilitate integration between new and existing processes.

Illustrative example: Hesitation regarding effect on existing product offerings

The new products were riskier than the existing business. There was hesitation to introduce them due to the effect on the existing business as well as the complexity and variability of the results. Alpha's customers were not at the top of the knowledge level concerning investments, and the staff in distribution was not well educated either. This led to Alpha not taking the lead in the new market.

–From an interview with Alpha's business manager

5.5 GAMMA: STARTING FROM EXISTING PRODUCTS

Gamma had a low level of success in the new market. It entered the market early but did not manage to develop a competitive business volume.

Gamma's position in the market originally consisted of the combination of two companies that were separate at the time of the regulatory change and subsequently merged. At that time, one part's activity included life insurance business, but the other part was late in entering the business. Accordingly, the two parts differed in proactivity, as one part was a proponent of quick action whereas the other required careful consideration of the implications of the regulatory change. In some of the aspects discussed below I will note discrepancies between the approaches of the two different units; otherwise, the approaches were similar.

5.5.1 A CAREFUL BALANCE BETWEEN OLD AND NEW PRODUCTS

The introduction of the new regulation introduced a new set of products, and Gamma made a series of changes in fund range selection. The corresponding requirements emphasized alignment between products and the available fund range. The product development process was impacted, as well as the need to understand product differentiation (i.e. portfolio management). The sequence of changes related to product development included an increased focus on portfolio management, due to the difficulty of integrating the new offerings with the existing ones. Gamma eventually initiated a concerted effort to introduce a combined product. A perceived challenge was that the product IT system, implemented in silos, limited the ability to achieve integration and thereby to become customer-focused. Gamma also needed to gain understanding of the links and overlaps between insurance and bank products. Gamma worked with launching combination products that included an element of the traditional guarantees of return on investment and the flexibility opened up by the new regulation.

At the outset of the regulatory change, Gamma was offering seven funds (an average number relative to the market), and this number increased between years two and seven.

5.5.2 EDUCATION PROCESSES TO UNDERSTAND NEW VERSUS EXISTING PRODUCTS

In terms of impact on distribution processes, there was an intense focus on channel development issues. One initiative resulting in limited life insurance sales was the development of distribution collaboration with an external retail organization. This collaboration was executed under a separate brand name, which was discontinued in 2001. The initial strategy was to utilize the retail offices, but due to the decrease in the number of such offices, the brand shifted towards Internet-based sales. With this exception, Gamma decided to abstain from independent and external distribution. Concerns were voiced regarding the balancing of paying commissions for sales efforts and management of advisory quality. Sales force education was heavily

emphasized. Also, the topic of sales force remuneration had to be addressed. Gamma faced challenges in that the salespeople preferred to sell the existing (traditional) products rather than the new offerings. It was not possible to sell the new fund-based products with the same logic used for traditional life insurance products. Efforts in general sales and marketing were put in place to use existing customer relationships to access the most relevant customer segments. Gamma's strong local ties in customer relations and the information in its customer databases facilitated insight in deciding where to take action. One concern mentioned by Gamma respondents was the difficulty of managing a dual customer focus: do you address the employee (who is the end customer of a life insurance) or the employer (who pays the premiums for the insurance)?

"We solved the remuneration issue in a bad way. We could not decrease the commissions for the traditional products." –CEO, Gamma

5.5.3 ASSET MANAGEMENT AND FUND MANAGEMENT PROCESSES MERGED

One area of impact on Gamma's service processes was the interface between asset management and fund management. Later in the period after the regulatory change Gamma chose to merge these two units so as to improve the co-ordination between them. Increased competition motivated a stronger focus on improving process efficiency. All back-office administrative processes in the life insurance business were involved. The possibility of the customer moving capital to other providers instituted process complexity due to the need to establish links across company boundaries. However, customers very rarely used this option, so it was not a major process concern for Gamma.

5.5.4 TECHNOLOGY TO SUPPORT NEW INTERFACES AND NEW PRODUCTS

The impact on information technology following the regulatory change was mostly inherent in the need for modified IT systems. The mixed blessing in

this regard was that the new technology could support new interfaces and new products, as well as providing increased efficiency, but that on the other hand, the presence of product-oriented IT systems in silos limited Gamma's customer focus. The merger of fund and asset management was followed by work to simplify the supporting IT systems.

5.5.5 SUMMARY OF GAMMA'S IMPLEMENTATION ACTIONS

Gamma was active in pursuing opportunities afforded by the regulatory change, but did not seize them as a central element of competitive advantage. Challenges arose in connection with the alignment of existing products with sales channel processes. Gamma made limited use of external providers. Technology was applied from internal providers and integrated between new and existing.

Illustrative example: Distribution channel remuneration conflicts

There was a strong conflict with the new products and the way that sales remuneration was designed relative to the existing business. This left little incentive for the distribution resources to sell the new products, especially since they had to invest in training to learn the new investments.

–From interview with Gamma sales director

5.6 KAPPA: COMBINING INSURANCE AND BANK PROCESSES

Kappa had a high level of success in the new market, entering early and sustaining competitive business volumes. A merger between its life insurance business and another life insurance company enhanced Kappa's position. Before the merger, the two firms had collaborated around insurance solutions. The new development put Kappa in the centre of the changes in industry boundaries between banking, fund management and insurance. Both former companies constituting the new group were keen promoters of the regulatory changes (e.g. they were proactively involved regarding the issue of calculation of taxes). Also, consideration of

collaboration slightly earlier (merger and acquisition talks with another firm in 1990) improved Kappa's preparations for the new regulation.

5.6.1 PRODUCT DEVELOPMENT AND PRODUCT PORTFOLIO MANAGEMENT

Kappa's immediate focus was on product development. The change in products brought with it a sequence of changes in fund selection. Kappa's approach to fund supply was to focus on its own internal funds, due to its belief that its funds were top-of-the-line in the market. The evolution of products and fund range was for Kappa rather a matter of applying different funds as well as fund-in-fund solutions (i.e. a combination of funds to match a customer need). Since Kappa was the result of a merger between a company with life insurance at its core and another with banking as its core business, the product development process fused these two perspectives into one new business model. Kappa focused on effort to establish product portfolio management where the links to related (traditional life insurance) products had to be balanced. This concern was expressed as a difficulty in moving away from defined-benefit to defined-contribution products, which introduced entirely new forms of guarantees for customers. Kappa attempted to balance complexity by limiting customer flexibility in using the new products. The more the customer had influence over the investments, the fewer guarantees could be given.

The increase in fund selection required new levels of transparency, expressed by Kappa a shift from being a product provider to a service company. The performance results of the new funds were essential for the success of the new business development in relation to the guarantees given in the old model. One subsequent area of development was to broaden product offerings to adjacent areas such as health care. Kappa launched a less expensive product among its range of options. In addition, Kappa began considering how to address the corporate as well as the individual market. For Kappa, collaboration with partners was not limited to the supply side for its own products, as Kappa also negotiated an agreement to

provide products to its competitor Beta. Finally, rules for calculation of tax charges influenced Kappa's product development decisions.

"The traditional life insurance has rules that are too inflexible." –CEO, Kappa

At the outset of the regulatory change, Kappa was offering 15 different funds, the largest number of any firm. This diversity decreased to 12 funds after five years but then rose to 18 after seven years, making it the second-largest range as of 1997. At that time, Kappa also started to include external funds in its product range, through collaboration with a UK insurance firm.

5.6.2 DISTRIBUTION PROCESSES INCLUDING REMUNERATION AND EDUCATION

The new regulation impacted Kappa's distribution processes and customer relationships. Due to the requirements governing distribution channels, new strategies were formulated including external network partners. Following the adjustment of distribution models, Kappa placed an increased focus on sales force management and changes in external distribution network relationships. Kappa viewed identifying and building relationships with trustworthy advisors in its existing bank branch offices and with independent agents as a key. The changes required the linking of processes, which translated into modifications of IT systems.

Kappa worked to educate participants in the distribution network, as well as undertaking sales force recruitment and training. It sought to enhance salespeople's ability to manage the changing customer relationships, new customer segments and the new influence from customers due to the greater product flexibility. Kappa instituted a formal education programme where training for both investment funds and life insurance was delivered. The potential direct access to product calculations required work to manage the implications of new product functionality. A balance was considered in terms of articulating possibilities contained in the new flexible solutions against the potential risks involved. The popularity of the concept and the level of customer interest in using the functionality depended on developments in the stock market. Regarding distribution and the related

customer relationships, the topic of customer communication was accentuated. Marketing was required to simplify the messages about the new product variety and to educate both customers and distribution channel representatives.

"It was important to have a mix of soft and hard rewards. We celebrated each deal with a cake, and the profit was allocated to the bank office." –Business development manager, Kappa

The key focus area in terms of service processes was the link and overlap between asset and fund management. To respond to the new business model, Kappa merged its fund management and asset management units. One primary emphasis for Kappa was to establish administrative efficiency, which was required to support customers' opportunity for direct access to product calculations. These service processes involved maintaining the functionality of products as well as the processes needed so that the customer could use the functions.

Additionally, Kappa lowered its transaction costs in connection with the trading of securities within the entire life insurance and fund management product assortment. And Kappa heavily stressed order and tidiness in processes and administration when establishing the new unit. Details like acquisition of proper archive cabinets and a set of rubber stamps and proper pens for legal signatures received attention. To develop the details of its new service processes, Kappa copied the practices of other life insurance firms by reviewing publicly available documents and forms from other companies. The link to IT from processes and products was of central importance.

"The regulators came to visit and were especially impressed with the archive." – Business development manager, Kappa

5.6.3 TECHNOLOGY FOR MANAGING THE NEW INTERFACES

The main impact on technology involved IT system modifications, specifically the administrative systems for managing processes and products. Re-use of and making connections between IT systems were considered,

since Kappa had assets to apply from the banking side of the business. Kappa's approach to technology development sought ways to link processes into IT systems. It was important to use the existing system for proposals to customers and connect it to a technology application that generated an agreement. This system was designed based on the product and process templates. Documenting processes and integrating them into newly developed solutions that supported the products thereby contributed to development of the new technology. The provision of IT systems was from internal development.

5.6.4 SUMMARY OF KAPPA'S IMPLEMENTATION ACTIONS

Kappa was in the epicentre of the change process involving life insurance, banking and fund management. Therefore, it pursued opportunities arising from the regulatory change as a central element of competitive advantage and was proactive towards regulators and other industry actors. Resources were dedicated to this opportunity, and staff were given freedom to innovate around the change. Kappa used external providers of processes and became a provider of products to its leading competitor, Beta. Technology integration between new and existing IT systems was a prominent focus for Kappa.

Illustrative example: Educating the distribution resources

Kappa invested significant resources into training its staff on customer relationships concerning the new products and the investments involved. This school was instituted and is still in force today.

–Interview with Kappa's head of business administration

5.7 DELTA: COORDINATION OF BROAD PRODUCT AND PROCESS RANGE

Delta had a medium degree of market success, entering late but managing (at times) to develop competitive business volumes. The account of Delta's experience relies on information from prior firms that have since merged.

Delta also set up collaboration with another firm that was eventually terminated due to increased competitive complexity.

5.7.1 BALANCING NEW PRODUCTS WITH THE EXISTING RANGE

From an overall industry context, Delta viewed the regulatory change as a change in tax regimes with accompanying potential advantages. They placed a strong emphasis on the evolution in insurance premium taxes and the ensuing need for international collaboration. A fundamental question that Delta addressed when dealing with the new business of fund-based life insurance was "What is a guarantee?" The essence of the discussion was that life insurance is a business based on the assumption of risk. If no risk is being managed, what is the benefit of the insurance? The identified difference with a fund-based life insurance company was that it handles both investment risk and insurance risk in combination.

"The tax advantages gave a good financial calculation, and we provided the administration for that." –Business development manager, Delta

The new products resulted in a sequence of changes in selection of funds, due to the new product design and the fund range to be included. A major focus was devoted to the fund range selection processes. The selection process was considered the true advantage, so Delta sought to offer a vast number of options while simplifying the process for the customer. An additional complexity was to address the link to other product areas and to consider different combinations. The balance between new and old products and their respective positions had to be considered carefully. The challenge was to break away from the existing product structure and to introduce the new offerings. Eventually, Delta established suitable supports for its focus on the new product range. Product portfolio development was a difficult area for Delta attempting to balance the old offer of guaranteed returns versus the new flexibility. Delta also emphasized understanding the relationship between customer segments and the product portfolio. Then the balance between existing and new products was further articulated.

"We have a broader and more complex product portfolio. This means we need to be more careful in selecting products relative to our marketing." –CEO, Delta

At the outset of the regulatory change, Delta offered eight different funds (an average number relative to the market), and this degree of variety remained stable for the next seven years.

5.7.2 THE PROCESS OF EDUCATING A LARGE DISTRIBUTION NETWORK

Delta characterized the impact on distribution as an issue of developing a network. The development activity included educating people whose roles included advising but who could also be considered part of the sales force. An increase in sales force capacity through education was complemented by generic information efforts such as sales and marketing. The distribution network included Delta's dedicated sales force employees as well as branch network resources, who also received education. The impact on customer relationships was coloured by the above-mentioned key question, "What is a guarantee?" This question drew attention to the balance between the guarantees offered in the old business and the flexibility offered under the new regulation. Increased efforts to communicate the new and old products to customers took place. Emphasis was also put on the need to understand customer segments and the corresponding product portfolio. Customer relationships were becoming more complex, and there was a need to match customer segments with the evolving portfolio.

Communicating produce information to customers, involving modifications of service and administrative processes, was an important necessity. Delta's customer base tended to be composed of people saving small amounts of money without a deep understanding of the stock markets. Delta focused its marketing efforts through the fund management unit. One key aspect of understanding customer segments involved distinguishing the needs of individual customers from those of corporate customers, i.e. an employer purchasing life insurance for its employees.

"We see fund-based life insurance as a more modern product. Traditional life insurance is more difficult to understand for the customers, especially regarding the calculation of the interest given." –CEO, Delta

5.7.3 FUND MANAGEMENT ADMINISTRATION PROCESSES

The issue of service processes covered the entire range of administrative processes. The dominant theme was to achieve low-cost administration. Delta also focused on its fund range selection processes. The company's strong fund-related competence convinced legislators to visit and study the company's fund management processes as part of their work in preparing the regulation. Aspects of governance were visible due to the strong basis of a bank ownership, which enticed legislators to view Delta as a model for management of processes including external parties. The balance of strategic partnerships was articulated as the need to address the roles of competitors versus collaborators (or sometimes both).

5.7.4 TECHNOLOGY FOR NEW PRODUCTS AND LOW-COST PROCESSES

Delta's internal technology unit created a modern system that could later be spun off as a separate company. Related technology implementation mainly covered modification of existing IT systems. These two streams were combined to integrate new with existing systems so that Delta could reach out across the broad distribution network that managed an extensive range of products.

5.7.5 SUMMARY OF DELTA'S IMPLEMENTATION ACTIONS

Delta took its time to emerge as a strong actor, partly due to the collaboration (later discontinued) with another firm that seems to have focused on other lines of business than the fund-based market. Limitations were thereby placed on the steps involved and on the existing business. Once its focus was established, the firm directed proper attention to the regulatory change as a business opportunity, and as a consequence Delta later experienced a fast growth in the market. The company engaged in the

use of external process providers, but has made limited use of external product provision. The technology implemented as a result of the new requirements was integrated with the existing solutions and was provided by internal resources. The technology provided at came from internal sources, but the IT department was eventually spun off into a separate and external company, albeit with Delta as its main customer.

Illustrative example: Challenge with a broad portfolio of offerings

Because Delta had a very broad customer base and also a broad portfolio of existing products to offer, the introduction of the new fund-based life insurance products was complicated. Time and effort were required to position the change appropriately.

–From interview with Delta CEO

5.8 SIGMA: LATE LEVERAGE OF PRODUCTS AND PROCESSES

Sigma achieved a low level of success in the market. It entered late and was unable to sustain competitive business volumes.

5.8.1 THE IMPLEMENTATION WORK OF SETTING UP NEW PRODUCTS

Sigma was from the start hesitant to enter the new market. This position was explained by factors such as finding the right timing of the development in the stock market. Changes in product design implied a need to modify the products and consider a potential fund range. Important actions were focused on the role of fund strategy. Promoting the new products alongside the existing (both bank and insurance) products was a challenge. Product development processes were impacted, and limited arrangements were made with competitors, such as the launch of a product with Luxembourg-based funds and life insurance coverage provided by a UK subsidiary of another firm. This collaboration was an attempt to leverage existing products with a short development time and apply them in the broad distribution network available. However, none of the initiatives to use external providers was

pursued with high focus. In terms of fund range, Sigma was not visible on the market until 1997, and then with three funds.

"We earn more money on bank account overdraft charges. Why should we sell this new life insurance?" –Business development manager, Sigma

5.8.2 ATTEMPTS TO LEVERAGE DISTRIBUTION PROCESSES

The impact on Sigma's distribution was mainly related to development of bank office distribution and related education. This process involved identifying and recruiting business area managers who could be trained to train the rest of the employees. The design of new sales and distribution strategies called for revised compensation models. The corresponding education of distribution personnel included consideration of proper advising processes. Here, a question of balancing roles arose: do you sell to the customer or do you give him the best advice? Key attention was given to the existing and trusted front-line employees, and to understanding what actions would enable them to offer the new products to their existing customers. It was difficult for a sales manager to abandon a well-known and profitable product for an unknown life insurance concept. Sales collaboration arrangements were instituted to a limited degree with international partners. Information delivery to customers was focused on developing relationships through marketing.

5.8.3 MODERN TECHNOLOGY TO BE INTEGRATED

Technology impact mainly concerned IT systems to cope with the extended functionality of products. These systems were built from a new platform using internal providers. The business unit established to manage fund-based life insurance was allowed to work with state-of-the-art information technology. As in those firms that had existing distribution networks, new and existing technologies were integrated.

"We started from scratch and developed IT ourselves based on the latest technology." – CEO, Sigma

5.8.4 SUMMARY OF SIGMA'S IMPLEMENTATION ACTIONS

Sigma, despite having all the criteria available for success, experienced challenges in implementing the requirements from the regulatory change. Engagement in external provision of products was limited and temporary and for processes not present. The integration of new and existing business was treated with hesitancy. The technology implemented as a result of the new requirements was integrated with existing solutions and was provided by internal resources.

Illustrative example: Lack of determination to enter the new market

We will enter the market when the development in the stock market is favourable. If the conditions for private customers are dismal, we will wait. –Statement from Sigma CEO

5.9 EVOLUTION OVER TIME AFTER THE REGULATORY CHANGE

As a complementary perspective to the separate accounts provided above for the six case-study firms, I will now consider how the industry evolved over time in response to the regulatory change. The accounts given above summarize the companies' major actions over a 17-year period, but grouping the actions by time period rather than by firm provides a complementary set of insights. Five time periods can be distinguished within these 17 years (see Figure 12). Analysis by time period also helps us to consider actions taken by the firms in response to their initial successes or difficulties.

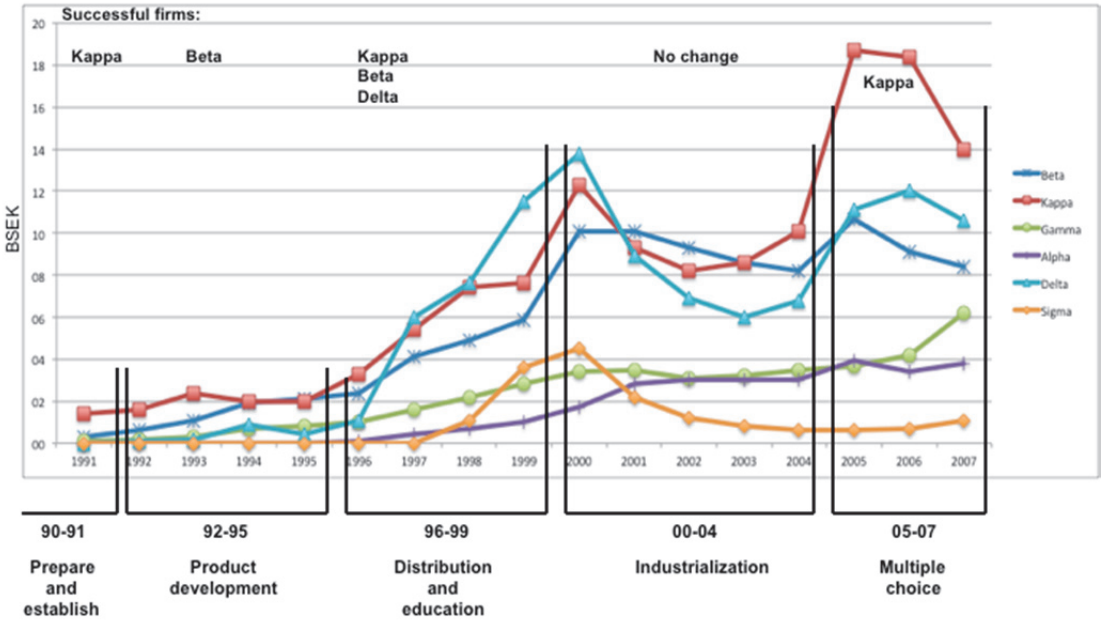

Figure 12. Breakdown of different phases after the regulatory change and observed success of the six firms during each period

5.9.1 1990–1991: PREPARE AND ESTABLISH BASIC PRODUCTS AND PROCESSES

In the initial phase, the focus was on setting up the business in terms of a basic set of simple products and corresponding processes. In this phase, the supporting technology was implemented so that firms could perform the business from day one. In this early phase, the firms that had been most proactive concerning implementation of the new requirements arising from the regulatory change were rewarded. The level of use of external providers was low and the integration between new and existing products, processes and technologies was limited. At this stage, Kappa was the most successful firm since it managed to leverage existing processes for the new business.

5.9.2 1992–1995: PRODUCT DEVELOPMENT

Once the foundation for the business activity had been established, product development received increased focus. The novelty introduced by the

regulation encouraged companies to consider including offerings from external providers as part of their total product marketing to customers. These external providers were integrated into the processes established in the previous stage. Here, important work was performed in linking new and old products and in incorporating external providers of the products and processes (distribution and services). Beta was most successful in this phase.

5.9.3 1996–1999: DISTRIBUTION AND EDUCATION PROCESSES

In this third phase, the most important task was to focus on external distribution channels and integrated service processes. The need to increase distribution capacity towards clients and also to utilize market knowledge about the new features of the products was growing stronger. Both internal and external providers held this knowledge. Delivery of information and education concerning the new products and how they differed from existing offerings had to be managed. Three firms demonstrated success in this phase; Beta, Kappa and Delta.

5.9.4 2000–2004: INDUSTRIALIZATION OF PROCESSES

As the market segment matured, integrating service processes became a prominent focus. The market developed towards integration of external providers by more firms, and the transparency of prices and margins came into focus. The use of information technology was important at this stage, along with the leveraging of process experience from the existing business, pooled with the innovative products and processes from the new business. Beta and Kappa were the most successful during this period. The entire market segment struggled during this period due to a declining in the global stock market, which favoured investment in safer products offering guarantees.

5.9.5 2005–2007: MULTIPLE CHOICE PRODUCTS

In its next phase of evolution, the market opened up with increased choices for customers. An important focus was on interfaces with external

distribution channels and external providers. Requirements were driven by the further increase in customer choice and the need for new processes to manage the range of available offerings. The customer could now include any listed investment security in the management of the life insurance product. This expansion of choice placed pressure on the management of technology that had to be modified to accommodate the new flexibility introduced. Kappa was the most successful firm during this phase. The events in this episode illustrate the need to manage the implementation of new requirements in operations, regardless of whether the firm had been proactive in the process in advance of the regulatory change. Even though one firm (Beta) had invested substantial effort in lobbying leading up to the authorization of the new and flexible products, it failed to manage implementation well due to difficulties in developing matching technology. Instead, Kappa mobilized the products, processes and technology to capture the majority of the market opportunity.

5.10 SUMMARY OF THE EMPIRICAL ACCOUNTS

The empirical accounts describe the actions taken by the industry actors when implementing the new requirements arising from the regulatory change in Sweden from 1990 onwards. The case studies reveal both common patterns and individual differences in how each firm addressed the new regulatory requirements. To explore these patterns and differences further, the empirical accounts will now be viewed through the lens of the theoretical framework in the next chapter.

6. ANALYSIS OF THE IMPLEMENTATION OF NEW REQUIREMENTS

This chapter further analyses the actions taken by six firms to manage the implementation of new requirements resulting from the regulatory change introducing fund-based life insurance. Differences between the successful and the less successful firms will be highlighted.

The analysis is presented in four steps. First, the actions of each firm are summarized. Second, their actions are compared across the dimensions of the theoretical framework, and contrasting the successful firms with the others outlines similarities and differences. Third, actions that supported the firms' gradually increasing use of external providers and their greater integration of existing and new products and processes are identified. Fourth, the differences identified are further compared over time in the period after the regulatory change.

6.1 SUMMARY OF THE ACTIONS AFTER THE REGULATORY CHANGE

The fund-based life insurance regulation introduced new requirements that were common across the entire industry. The first impact was on the products provided, since the regulation introduced a framework within which life insurance companies could offer a new set of products. The product requirements included a new set of functionalities, which influenced the structure of products. Firms responded to this opportunity by taking subsequent actions concerning processes and technology. To reach customers with the new products, distribution processes were modified. The continued evolution of these processes involved employee education as well as the design of remuneration schemes for the sales force. Impact on technology platforms and systems was observed as well, due to the need for

new interfaces as well as new functional elements in the products. Complementary service processes were included to provide for the new requirements, and these processes were applied to managing the old as well as the new business. Customer relationship processes also changed as the companies sought to communicate the content of the new products.

Although the requirements and the overall areas of impact were the same for all companies, the firms responded in different ways. In this chapter, I describe these differences by populating the dimensions of the theoretical framework with the actions taken by each firm, permitting readily understandable comparisons between their approaches. With the theoretical framework as a guide, actions were identified from the empirical material and then compared to determine similarities and differences between the firms and to place them relative to the four possible decision categories articulated in the framework. Table 6 presents an initial explanation of the actions found for products, processes and technology.

6.2 THE ACTIONS OF THE DIFFERENT FIRMS

In the empirical analysis, considerable consistency can be found in the accounts of how the firms managed new requirements after the regulatory change. When asked about what they did, all firms described actions in the three areas contained in the theoretical framework: products, processes and technology. To aid the search for differences that may be related to the various firms' level of success, I will briefly summarize each firm's main actions.

Beta was an early mover and proactive when the new regulation was introduced. It utilized a range of independent and external collaboration partners, both for products and for service and distribution processes related to customer contacts. Beta also took decisive action to integrate its new products and processes with existing ones. The new technology required was developed internally and integrated with existing technology. Beta achieved high market success, with consistent above-market performance over the 17 years after the regulatory change and a strongly successful position during the first five years after the change.

Table 6. Overview of observations of impact areas in the theoretical framework

	Integration of existing and new	
Use of external providers	Low	High
High	This option was not found in the empirical data.	Use of external providers of *product* functionality (investment funds) for the requirements of the new regulation. The new solutions were integrated with the existing business through combination products or applying product portfolio management. External partners were used to provide support in distribution and service *processes*, which were integrated with existing processes.
Low	Use of internal providers of *products* (funds) for the requirements of the new regulation with no integration to the existing business. Internal resources were used for distribution and service *processes*, separately from the existing processes.	Use of internal providers of *products* (funds) for the requirements of the new regulation. The new solutions were integrated with the existing business through combination products or applying product portfolio management. Internal sources were used to provide support in distribution and service *processes*, which were integrated with existing processes. Internal *technology* was developed to support the new requirements. The new technology was integrated with the existing systems and platforms.

Alpha was active early when the regulation was launched, yet it did not manage to enter the market quickly. Alpha's market success can be rated as low. The company did not achieve high volume in the first five years after the regulation. It favoured internal approaches for products and the processes of service and distribution to customers. Hence, Alpha focused on actions that involved internal providers. The new technology required was developed internally and integrated with the existing systems. Alpha took limited actions to integrate new and existing products and processes.

Gamma entered the market early and showed some proactivity in connection to the new regulation. Nevertheless, its level of market success was low, both over time and during the first five years. Gamma decided to rely on internal actions for products as well as service and distribution processes to customers. It took concerted actions to integrate new and existing products. The new technology required was developed internally and integrated with existing systems.

Kappa was an early mover (and the biggest winner in the early years of the market's development) and proactive when the regulation was introduced. Its market performance was high over the entire 17-year period after the regulatory change. The company applied internal models for product provision and internal as well as external providers of distribution to customers. Kappa engaged in external provision of products as a partner of one of its competitors. The new technology required was integrated with the existing technology, based on internal sources of development. Kappa´s actions exhibited a high focus on the use of external process providers as well as integration between existing and new products, processes and technology.

Delta was active early in connection with the regulation, applying internal models for products and distribution to customers. Delta had a moderate level of success, improving from a slow start during the first five years to achieve better results later in the time period. The requisite development of new technology took place internally and was integrated with existing systems. Delta's distribution activity included the use of external providers. Hence, Delta applied a mix of actions concerning the use

of internal and external providers as well as in the integration of existing and new products and processes.

Sigma was late in entering the market and showed limited proactivity when the regulation was introduced. Its market performance was low across the entire period. Sigma applied internal models to product provision as well as in its processes for service and distribution to customers. Internal development of new technology was integrated with the existing systems. In summary, Sigma had a low focus on the provision from external parties, and its integration between new and existing products and processes was also low.

I will now draw on these descriptions of each individual firm's behaviour relative to the theoretical framework to identify differences between the firms across the areas of impact and in the actions taken to implement new requirements.

6.3 DIFFERENCES BETWEEN FIRMS ACROSS THE AREAS OF IMPACT

The data offer no single obvious indication of what would make an implementation approach following this regulatory change successful. Hence, I next developed the cross-case analysis further by consolidating the differences. A consolidated view of the different actions taken by the six firms relative to the theoretical framework is outlined in Table 7.

Table 7. Consolidated view of firms with more and less success in the framework

	Integration of existing and new	
Use of external providers	Low	High
High	No observations in empirical data.	The successful firms.
Low	The firms with less success.	A mix of different case firms.

To expand on the combined similarities and differences, Table 8 lists each case firm's behaviour with regard to the three impact areas of products,

processes and technology and the level of integration between the existing and the new. High integration was observed consistently for the two successful firms. The less successful firms relied more heavily on internal providers and performed less integration of existing and new products and processes. All firms took similar actions concerning technology, as internal provision of new requirements was integrated with the existing systems.

Table 8. Individual firms' actions relative to each of the possible actions contained in the theoretical framework

	Integration of existing and new	
Use of external providers	Low	High
High	No observations in the empirical data.	Beta / Products Beta / Processes Kappa / Products Kappa / Processes Delta / Processes
Low	Alpha / Products Delta / Products Sigma / Products Gamma / Processes Sigma / Processes	Gamma / Products Alpha / Processes Beta / Technology Kappa / Technology Alpha / Technology Gamma / Technology Delta / Technology Sigma / Technology

The summary view shows that Beta was most active in using external providers and in integrating existing and new products and processes, with Delta and Kappa doing the same in processes. These results will now be further discussed across the two dimensions of the theoretical framework.

6.3.1 EXTERNAL OR INTERNAL PROVIDERS

Several industry participants, at the outset, saw the new regulation as causing a limited and incremental change to business practices with "only a new investment offering added to the product".[25] The true implications of the

[25] "The products are the same as the traditional insurance. It is only the savings part that is new", said one business manager in an article in *Försäkringstidningen* (The Insurance Magazine), May 1990.

change were more radical than that assessment, and the new regulation turned out to have a sweeping influence across processes and technology as well. The new requirements opened up opportunities for new providers in the market via changes in interfaces, which is an effect observed in previous studies of the impact of regulatory changes (Jacobides, 2005). A new set of providers, the fund managers, was established within the market. There were clear differences between the firms in the use of such providers. Also, new process providers appeared, in the form of independent agents working with both sales and advice functions. Some firms used these providers and others did not. The differences in the firms' actions concerning the use of external providers may have depended on their differing assessments of the risks of collaboration. Similar differences have been observed in other relationships between firms in separate industries (Jaspers et al., 2012). There was limited use of external technology providers, and this may have been due to the lack of external options in the early phases after the regulatory change. Further insight will now be presented concerning the use of external providers across products, processes and technology.

6.3.1.1 PRODUCT PROVIDERS

Only Beta ventured to involve external product providers during the first seven years after the regulatory change. One other firm (Kappa) followed in 1997, and most of the remainder did not do until after at least 10 years. Kappa was also active in external product provision as a supplier. Today, 26 years after the regulatory change, offering external funds in these products has become a mainstream practice. The lack of action to engage external providers early after the regulatory change cannot have been due to lack of familiarity with the provider market, since the fund management industry had evolved into a successful business with a rich range of providers.[26] The two companies that ventured into arrangements containing external fund sources were the most successful ones. Their actions increased flexibility in handling changing customer requirements, which can be a key customer expectation (Brusoni et al., 2001). Previous experience through international

[26] For a detailed description of the fund industry´s evolution, see Jonsson (2003).

relationships of this type of provider arrangement contributed to the readiness to embark on collaborations with external providers. Knowledge was hereby drawn from a sector outside life insurance, namely the fund management industry, which is one way to take advantage of new integration arrangements (Jacobides & Winter, 2005).

6.3.1.2 PROCESS PROVIDERS

In the wake of the regulatory change, new processes were introduced concerning sales, distribution and customer advising. Implementation of the new requirements from regulatory change is facilitated by the use of a combination of internal and external processes (Pisano & Teece, 2007). Three firms applied mostly internal distribution by means of their own sales force or branch offices, and three took an external approach by leveraging independent agents or financial advisors and brokers. These new players entered the market as control actors and certifiers of quality, a central role after changes in regulations (Cacciatori & Jacobides, 2005). The differences here correspond directly to levels of success in implementing the new requirements; the three most successful firms used external providers most extensively. The willingness to take risk by changing interfaces and including an actor from a different industry in processes has been indicated as an enabler of effective action to implement new requirements (Chen & Liu, 2005).

6.3.1.3 PROVIDERS OF TECHNOLOGY

The regulatory change triggered new technical requirements for the industry, as has been similarly observed in the history of the automobile industry (Abernathy & Clark, 1985). Technology was needed to support the emerging new products and processes, enabling the establishment of a new dominant design (Anderson & Tushman, 1990). Even though some applications of external technology were found useful for a limited set of special-purpose applications, all firms' primary approach was to develop the required new technology internally. No technology solution for the new requirements was available for purchase in the market. Such a situation appears when there is a lack of standardized information concerning

products and processes, and in these cases, firms are more likely to resort to internal provision (Jacobides, 2005). The approach to technology does not seem to be a deciding factor with regard to the successful implementation of new requirements contained in the fund-based life insurance regulation.

6.3.2 INTEGRATION OF EXISTING AND NEW PRODUCTS, PROCESSES AND TECHNOLOGY

A new regulation presents new requirements to the firm from the market and customers (Jacobides & Winter, 2005). The new insurance regulation in 1990 introduced new needs in the areas of products, processes and technology. Each firm took action either to perform integration with the existing or not to integrate. The particular actions taken depended on the balancing of existing and new products, processes and technology, which can be explained in terms of how firms act to translate customer and regulatory requirements into technological specifications (Brusoni & Prencipe, 2001). Below, the actions concerning integration of existing and new products, processes and technology are analysed separately. Consistently, across impact areas, the more successful firms were more active in pursuing integration. This observation is in line with previously described efforts to facilitate regulatory compliance across different products and processes (Meyer & Dalal, 2002) and to integrate new regulations in existing products and processes to achieve market benefits (Richard & Devinney, 2005).

6.3.2.1 INTEGRATION OF NEW AND EXISTING PRODUCTS

It is common for a change in regulations to introduce new products, along with new components related to those products (Anderson & Tushman, 1990; Zwerink et al., 2007). The new fund-based life insurance regulation introduced new products of a different nature from the existing life insurance business, but the customers were largely the same. Accordingly, companies could choose either to integrate or not integrate their two different types of offerings. Action to translate new regulatory requirements into a complete offering can be undertaken by firms on behalf of their

customers (Brusoni et al., 2001). The two most successful firms both put considerable effort into the integration option, in the realms of education, modification of remuneration schemes and tangible creation of combined product solutions. Packaging practices have proven beneficial for firms when regulations change (Ferraro & Gurses, 2009).

In addition to the overall observations on the integration of new and existing products, two more specific aspects related to this integration can be found in the empirical data and the within-case analyses: the application of product portfolio management and the use of packaging.

First, product portfolio management is appearing as a conscious practice of considering the entire product range in relation to the customers of the company. This practice is a way to mitigate differences between market demands and uncertainty regarding how to interpret those demands (Karlsson & Sköld, 2007). Looking at products across a portfolio can identify common regulatory product and process characteristics to be implemented on a platform (Meyer & Dalal, 2002). Two firms seemed to treat the new products as stand-alone, perhaps due to the complexity involved in incorporating product offers into their portfolio and their broad customer base. Four firms attempted to align the new products with existing ones in a combined offer.

Second, when new products were entering the market in the process of the regulatory change, these offerings had to be packaged to suit specific customer segments. Regulations might also limit the options for tailoring products to the market and might increase the time required for new products to be launched (Wouters et al., 2011). The actions taken to package products in relation to customer segments differed among the firms. The new market conditions were open for interpretation by both customers and firms. Three firms applied an approach with similar offers to many customer types, and three took a more specialized approach (demanding custom-made considerations for each client segment). The latter choice of action provides a link between the products and processes and also provides a way to understand the links established between the existing and new products presented. The associated challenge, however, is that an increasing

number of components can arise as a result of customer requirements and evolving regulations (Brusoni & Prencipe, 2001).

6.3.2.2 INTEGRATION OF NEW AND EXISTING PROCESSES

The performance of tasks in a process can be mandated by regulatory circumstances (Gulati & Singh, 1998). The regulatory change studied here compelled the establishment of new processes to support the new business opportunities. The new requirements related to a regulatory change may also influence existing processes (Jacobides & Winter, 2005). Here again, the firms differed in their approach to developing new service processes; four firms applied an integrated approach and two did not take action to integrate existing and new processes to the same extent. The most successful firms both applied an integrated approach. Their actions could be characterized by a desire to align their approach to the wishes of regulators (Gurses & Ozcan, 2014).

6.3.2.3 INTEGRATION OF NEW AND EXISTING TECHNOLOGY

New regulations have been observed as a driver of requirements for new technology (Abernathy & Clark, 1985). The evolution of technology in the context of regulatory change raised the issue of whether to integrate existing solutions with the newly constructed systems or platforms. In this regard, there was no difference between firms. All of them applied the same approach, integrating new technology with existing ones. A potential explanation for this result is that technology is a vital business foundation in the life insurance industry, and that therefore it is common to rely on internal resources to develop platforms for new business ventures (Tee & Gawer, 2009). Actions concerning technology are therefore not considered a differentiating factor explaining the ability to implement new regulatory requirements.

This comparative review of the firms' actions has unearthed clear patterns of differentiation and their relation to market success. When we consider the actions required to achieve high integration of new and existing products, processes and technology, as well as high use of external providers

in the theoretical framework, seven specific actions are identified. These actions address tensions to be mitigated in order to balance the conflict between new and existing business logic (Baldwin & Clark, 2000). The actions of the six firms relative to the different options in the theoretical framework exhibit a gradual movement towards higher degrees of integration, which introduces the need to focus on interfaces. The actions indicate signs of evolution in the efforts of the firms to manage the new requirements from the regulatory change.

6.4 ACTIONS TO SUPPORT HIGHER LEVELS OF INTEGRATION

With regard to integration-related actions in which successful firms display differentiating features from others, seven actions can be found, reflecting the need for practices similar to bundling (Hobday et al., 2005; Kenney & Pon, 2011) and packaging (Cacciatori & Jacobides, 2005; Ferraro & Gurses, 2009) involving interfaces strategies (Chen & Liu, 2005) as presented in previous research. As a result the need to manage interfaces becomes more visible over time. The successful firms were more prone to implement each of these actions to manage the new requirements. Each one has unique impacts related to product, process and technology.

6.4.1 INFORMATION SHARING

After the regulatory change, processes were implemented under which the organizations needed to manage daily fund pricing (in accordance with the required functionality of the new products). This requirement entailed establishing connections to the fund manager (internal or external) as well as confirming the correct amount of assets on the books. The new process had to be incorporated into operations while, at the same time, the yearly bonus calculations on the old products had to be continued as before. The successful firms managed to carry out these changes through the application of interfaces for processing the information. Initially, most connections were made with internal providers of fund management, but one firm also applied integration with external providers. The ability to share information

is an important enabler of changes in roles and actions within an industry (Jacobides, 2005). Information sharing is necessary for different components to interact across interfaces (Baldwin, 2008).

6.4.2 CUSTOMER REQUIREMENT INFUSION

In the era before the regulatory change, there was a consolidated calculation of taxes for the pool of assets held for the entire customer population. The new regulation introduced the need not only to determine taxes for the company as a holder of fund investments, but also to make calculations of individual customers' tax situation and report this information to each client account. The complexity arose due to this infusion of new customer requirements, which the most successful firms managed to handle better than their peers. Interfaces were established to relate to the functionality of the customer requirements. The actions taken here highlight the need for interfaces to manage collaboration between firms (Ferraro & Gurses, 2009). Providers of complex products can end up with the responsibility of integrating customer requirements from regulations (Brusoni & Prencipe, 2001), and such integration requirements can create a competitive advantage for those who respond most effectively (Salvador et al., 2002).

6.4.3 PRODUCT PORTFOLIO MANAGEMENT

The regulatory change introduced possibilities for radical product innovation and increased complexity in supply. Customers were now offered increased flexibility, but in connection the question arose of how the new flexibility would be related to the historic stability of product offerings. The two most successful firms managed to balance the drive for product innovation with the stability of previous offerings by creating interfaces that combined product offerings and by investing in education of the differences between new and existing products. This product integration capability is consistent with prior observations of the need to consider the interface between new requirements and existing products and processes (Pisano & Teece, 2007). The combination of existing with new dominant designs is an

example of the balance needed when a company responds to changes in regulations (Anderson & Tushman, 1990).

6.4.4 PROCESS ALIGNMENT

The balancing of the connection between service processes in asset management and fund management requires not only interfaces between the two processes, but also an understanding that parts of these processes are managed separately. The successful firms effectively managed both the separation and the integration of these processes. Their actions in this regard was a response to implications from that the insurance business was exposed to competition from firms that were previously not allowed to enter the industry. The removal of a protection came as a result of the regulatory change, and such removals are addressed by combining processes to mitigate the effect of the new competition (Teece, 1986, 2006). Firms in similar settings in the financial services industry have been able to create interfaces between processes for different product segments and thereby been able to mange new requirements better (Meyer & Dalal, 2002). Challenges to realize such synergies lie in the difficulties involved in understanding different customer requirements across different products and processes (Karlsson & Sköld, 2007).

6.4.5 QUALITY CERTIFICATION

Distribution that created interfaces between the firms and their offerings with customers included elements of both sales and advice. New processes were executed both by independent partners and by firms' own resources. As the most successful firms sought to balance the new requirements of information and education across the processes of sales and advice, quality certification emerged as a distinguishing feature. Quality certification was a process used by the life insurance firms to address integration and interfaces in two directions. The first direction related to relationships to new actors that made assessments of the quality of the products offered by the life insurance firms. The second direction was the firms themselves instituting quality assurance to assess the providers of fund management to be included

in product offerings. The approach needed to address the new requirements was to set up processes that were different in nature but contained the same fundamental building blocks. It has previously been reported that new and existing firms can take on the role of certifying quality in the course of changes in the dynamics of an industry (Ferraro & Gurses, 2009; Funk, 2015).

6.4.6 SYSTEM ARCHITECTURE ESTABLISHMENT

Technology enabled firms to implement the new requirements of product and process flexibility, and it was also an underlying factor in achieving efficiency. The technologies required for these two different purposes were of different natures. The existing technology was built for the existing products and processes in the form of stable mainframe systems, and the new solutions were based on mid-range and personal computer systems. The most successful firms balance the needs for efficiency and flexibility in technology, and they also balanced the integration of new technology with interfaces towards the existing "legacy IT". The action of establishing a system architecture can be seen as a consequence of the evolution of new dominant designs following a regulatory change (Anderson & Tushman, 1990). The system architecture is relevant to provide interfaces for product support (Chen & Liu, 2005; Fixson & Park, 2008) and, in this connection, can also influence the architecture of the industry (Jacobides et al., 2006).

6.4.7 PLATFORM EXTENSION

Another important technology-related action was a change from a monolithic platform technology to a number of new systems. This type of action challenges existing arrangements both on an individual product level (Chen & Liu, 2005) and at the industry level (Jacobides et al., 2006). The new regulation introduced requirements that the existing IT systems could not cope with, and there were no external solutions on the market. Therefore, all firms needed to design and build new IT systems internally. The existing IT platforms were still valid for use, and they supported the need to integrate between internal and external providers as well as the

existing and new products and processes. The most successful firms managed to address interfaces between new IT systems and existing IT platforms. Such actions have been linked to other responses to regulatory changes influencing the adoption of technical requirements (Abernathy & Clark, 1985). Platforms have been shown to form the basis for success in entering new markets (Tee & Gawer, 2009) as well as managing requirements across different segments (Karlsson & Sköld, 2007).

6.4.8 ACTIONS TO SUPPORT IMPLEMENTATION OF NEW REQUIREMENTS

The seven actions discussed above represent responses to manage the new requirements arising from a regulatory change. Table 9 summarizes the firms' main actions observed in the empirical data and their results.

Table 9. Firms' actions to achieve higher levels of integration

Empirical evidence of action	**Action**	**Impact area (Product / Process / Technology)**	**Case observations: what did firms achieve through these actions?**
Price calculations of fund holdings	Information sharing	Products	Manage to handle the new and faster process time, yet maintain quality.
Tax calculations	Customer requirement infusion	Products	Ability to handle the shift from calculating with a firm-centric purpose to a customer-centric one.
Flexibility or stability	Product portfolio management	Products	Manage the new flexibility introduced in products, but still mitigate the complexity and risk for customers.
Asset management versus fund management	Process alignment	Processes	Implement different processes for the two models, but still seek integration.
Sales or advice	Quality certification	Processes	Execute processes with both sales and advice and balance the different purposes.
IT systems for efficiency or flexibility	System architecture establishment	Technology	Balance the need for continued efficiency with new introduction of flexibility in IT.
IT systems and platforms	Platform extension	Technology	Manage to maintain utilization of existing platform, but also introduce specialized systems on top.

6.5 ACTIONS OVER TIME AFTER THE REGULATORY CHANGE

As one more dimension of the analysis, I will now examine the firms' activities in four out of the five time periods identified in chapter 5 within the 17 years after the introduction of fund-based products into the Swedish life insurance industry. The period 2000-2004 provides no additional evidence in the analysis, since the positions of firms are similar before and after this period. This analysis will deepen the observations with regard to what actions firms took during the period after the regulatory change. The different fortunes of specific firms are better understood by looking at variances over extended periods of evolution (Ferraro & Gurses, 2009; Funk, 2015). The following discussion offers specific observations regarding successful firms' actions in each time period, and these actions are related to the theoretical framework.

6.5.1 INITIAL FOCUS ON INTERNAL PRODUCTS AND PROCESSES

As a consequence of regulatory change, new products and processes need to be established (Pisano & Teece, 2007). The main focus during the first time period after the regulatory change (1990–1991) was of an internal nature. Kappa was the most successful firm in these initial years, taking action to integrate new and existing products, processes and technology. These actions exploited the opportunity to change responsibilities across different products and processes, which Baldwin and Clark (1997) described as the management of modularity. The analysis indicates that Kappa established interfaces within its existing business early to provide the specific products and processes required. Firms needed to establish in a short period how the new business would be managed relative to the existing one. Hence, the arrangements made by Kappa displayed an early understanding of the need to manage a new and complex system of the type that can emerge after events such as a regulatory change (Hobday et al., 2005).

6.5.2 PRODUCT DEVELOPMENT WITH USE OF EXTERNAL PROVIDERS

The second time period, 1992 to 1995, featured the evolution of products from the first basic offerings. Understanding of the new requirements arising from the regulation gradually increased as the implications for products were assessed and understood (Zwerink et al., 2007). Beta was most successful in taking action at this point, with a heavy focus on establishing interfaces to external providers for both products and processes. Beta hence obtained increased flexibility to deal with uncertain customer requirements. Previous research has found similar actions being transferred to firms from customers after a regulatory change (Brusoni et al., 2001). The new products and processes were integrated with the existing business. Beta was the only firm to embark on integrating external providers at this time, although Kappa and Delta also engaged in the use of external process providers in this phase. These actions enabled actors in the new ecosystem to provide different products and processes, a key factor that supports the emergence of new roles for actors in an industry (Tee & Gawer, 2009).

6.5.3 INTENSIFIED EXTERNAL DISTRIBUTION PROCESSES

After the early focus on internal product development, the next time period (1996–1999) entailed more involvement with external actors. It can be expected that the gradual evolution of a system will lead to more complex integration arrangements (Hobday et al., 2005). These years involved a focus on distribution and education relative to customers. Beta, Kappa and Delta were the most successful firms. All three continued to leverage interfaces towards external process providers, especially within the area of sales and advice around the new products. They took on the role of packagers of the new, complex products and processes relative to the customers in the market. A similar role can be found in the actions of MCA in the US movie industry (Ferraro & Gurses, 2009).

6.5.4 EXTENDED EXTERNAL PROVIDERS OF PRODUCTS

The fifth delineated time period (2005–2007) introduced an extended array of options including external providers of products. Kappa was the most successful firm due to its ability to leverage both internal and external providers of products required in managing complex sourcing arrangements (Salvador et al., 2002). Consistent with the research observations of Abernathy and Clark (1985), a new level of complication was introduced and a new level of flexible technology support was required. In combination with its ability to create interfaces with suppliers, Kappa implemented the most successful products and processes to respond to the new requirements in this period.

6.5.5 MANAGING THE IMPACT OF REGULATORY CHANGE OVER TIME

This further elaboration of the analysis across four out of the five time periods supports the conclusion that the ability to combine integration between existing and new products, processes and technology with the use of external providers is a sign of success in the implementation of new regulatory requirements. An increasing focus on interfaces, rather than the individual products, processes and technology, is emerging over time. The characteristics reported are in line with the capabilities outlined for firms performing integration and managing interfaces in complex systems (Hobday et al., 2005). A common theme indicating the ability to implement new requirements from regulatory change over time is flexibility in the approach towards products, processes and technology. The actions executed concerning external and internal providers as well as the progress of integration arrangements between new and existing products, processes and technology need to be under constant review. A corresponding need for establishing and managing interfaces arises when firms apply the use of external providers and partners in the vertical chain of production (Pisano & Teece, 2007). A picture of the evolution of activities across the different time periods, summarized as early, mid-term and final stages, is presented in Table 10. The table illustrates that across the evolution over time all firms in

the early stages start in the same way. Then only the successful firms took action across all impact areas in the mid-term stage, whereas the less successful firms took selected action. In the final stage only the firms with more success took action with regards to high integration of existing and new products and processes as well as high use of external providers.

Table 10. Firms' actions over time related to the theoretical framework

	Integration of existing and new	
Use of external providers	Low	High
High	No use found.	The *final* stages after the regulatory change. Actions in products (customer requirement infusion) and processes (quality certification). Only the successful firms took action here.
Low	The *early* stages after the regulatory change. Development of separate products, processes and technology to meet new requirements. All firms took action here.	The *mid-term* stages after the regulatory change. Actions with regard to products (portfolio management and information sharing), processes (alignment) and technology (system architecture establishment and platform extension). All successful and some less successful firms took action here.

6.6 THE SUCCESSFUL FIRMS TOOK ACTION TO INTEGRATE PRODUCTS AND PROCESSES

Based on the cross-case analysis, the final step in the analysis involves considering the specific differences between successful firms and their peers when implementing new requirements connected to the impact from the regulatory change and how they realized these actions. I will further explore the characteristics that distinguished the two most successful firms, leading to explanations of their ability to manage the implementation of new requirements following the regulatory change. The differences concern actions related to products and processes as well as the actions adopted over time.

6.6.1 PRODUCTS: INFORMATION SHARING AND CUSTOMER REQUIREMENT INFUSION

A focus on external providers, rather than pure internal reliance on the firm's own asset management units, was executed only by Beta. The other firms engaged in limited extensions with external sources, but not for at least seven years after the regulation's enactment. Kappa could be considered as part of an external sourcing dynamic, since it reached an agreement with Beta to provide funds despite being a direct competitor of Beta. Partner networks, both local and international, facilitated connections with external providers. The impact on service processes was considerable since the external link required establishment of different interfaces than a pure internal option.

The business logic in working with external fund selection was of a different nature from the previously performed asset selection (for direct ownership in securities). A focus on actions concerning the market for external funds was a distinguishing feature of the two successful firms. An external change such as a new regulation presents novel opportunities for companies to consider product innovation. The successful firms took action to modifying their existing products as well as introducing new ones. The evolving process introduced new resource categories, such as legal skills, and introduced components from adjacent areas. It was a time for new products

with radical features to be put alongside other (profitable) products and connected via interfaces to existing customer relationships. To execute this action placed demands on product portfolio management. Moreover, it was necessary to facilitate the relevant advisory and sales processes, with infusion of insights from external distribution channel and product selection partners.

6.6.2 PROCESSES: QUALITY CERTIFICATION AND ALIGNMENT

The choice to use external and independent distribution, rather than one's own internal resources, was enabled by a change in regulations at the same time as the fund-based insurance was introduced. The most successful actors were both active in distribution arrangements, giving them access to specialized skills in managing the new and evolving complexities of the extended choices available and their many different investment options for customers. The external resources offered valuable support in enabling sales and advisory staff to understand and explain the new products. The relationship with the customer had to be in balance between the external channel and the life insurance firm. The use of such external channels required the support of new information technologies for establishing interfaces. The successful firms also found a balance in determining remuneration schemes for the new (external) channels and the existing (internal) sales outlets. The ability to perform education across both internal and external channels is indicated as a factor in their success.

The firms that enjoyed more success after the regulatory change were able to take action to implement new requirements in processes based on the new regulation. Even though these new requirements diverted from existing processes, the successful firms purposefully established interfaces for integration between the new service processes and the existing support for the traditional business. Beta launched collaboration between the new business unit and the old life insurance company. Hence, while opening themselves up to radical influences when responding to the regulatory change, these firms did not apply a stand-alone approach to their service processes. The mode of integration of service processes depended on the

products' features and on the similarities and differences between their functionalities.

The new processes were of a different nature from what the life insurance industry had experienced previously, and one element of success was the selective integration of new and existing processes. The need to take action concerning integration was particularly apparent in the case of fund management and asset management. Understanding the respective similarities and differences between these two disciplines gave Beta and Kappa an advantage when implementing the new requirements.

6.6.3 ADOPTION OF THE ACTIONS OVER TIME

Even though the successful firms carried out a consistent pattern of actions, typified by the incorporation of external providers and integration between new and existing products, processes and technology, there were occasions in the time sequence after the regulatory change where particular actions diverged from high levels of integration. The emerging pattern indicates that, to manage the implementation of new requirements following a regulatory change, firms need to gradually adopt actions to manage evolving tensions between the new and existing business, with a growing attention to external integration over time. The sensitivity towards the level of integration across the impact areas of products, processes and technology demands attention to associated interfaces for the integration between the different parts to function.

6.7 CONCLUDING THE ANALYSIS

The identification of actions performed by firms to implement new requirements resulting from regulatory change exhibits actions of combining individual components into marketable products and supporting processes (Schilling, 2000). When firms engage in bundling, unbundling or re-bundling, there can be effects on the structure of industries (Langlois & Robertson, 1992). Requirements from regulations can reinforce the strengths of one company at the expense of competitors in an industry

(Jacobides et al., 2006). For example, firms that use interfaces to combine products or services can combine high-value solutions with lower end complements for offer to the new market (Ferraro & Gurses, 2009). The use of interface capabilities can also enable the alignment of service processes with products (Hobday et al., 2005). Requirements triggered by regulatory change can "lead to newly integrated bundles of services" (Cacciatori & Jacobides, 2005, p. 1854). Regulatory changes can in this way influence the actions performed by firms with regard to products, processes and technology (Funk, 2015). As illustrated in the analysis, firms face evolving decisions on how to integrate internal and external sources of products, processes and technology (Teece, 2006).

The cross-case analysis has identified actions taken to manage the new requirements from regulatory change by six life insurance firms. Those firms with greater market success displayed distinctive behaviours. Their actions concerning products were supported by information sharing and customer requirement infusion; with regard to processes, they effectively applied quality certification and process alignment; and finally, they planned their adoption of actions over time after the regulatory change. Firms taking a series of actions over time focus more on integration and associated interfaces rather than only on the individual actions aimed at meeting specific requirements. This is illustrated by their ability to integrate both new and existing products and processes, as we as the use of external providers for products and processes. Overall, the examination of what successful firms do to manage new requirements from regulatory change highlights the integration of different areas, which in turn points to the importance of managing corresponding interfaces so as to address any tensions and conflicts that may arise (Baldwin & Clark, 2000).

7. DISCUSSION: FINDINGS AND CONTRIBUTIONS

As we saw in the previous two chapters, the analysis of six firms' response to the impact from the fund-based life insurance regulation identified actions that distinguish the two most successful firms from the others. The successful firms gradually involved integration with external providers and achieved a high degree of integration of new and existing products and processes. These strengths highlight the associated need to manage interfaces introduced or modified as a result of the regulatory change. To achieve integration between different parts, interfaces are required (Baldwin & Clark, 2000; Jacobides & Winter, 2005; Simon, 1996).

In this chapter, the capability to manage interfaces is described and defined based on the actions taken to implement new requirements. Then, in the contributions section of the chapter, the capability is positioned to enrich previous theory. Responses are given to research questions based on previous calls for further research as described in chapter 1. First, the capability to manage interfaces adds insight to the influence of regulatory change and the resulting management tasks identified in the process of framing the problem. Second, a perspective is presented to complement previous depictions of a capability as either ordinary or dynamic (Teece, Pisano & Shuen, 1997; Teece, 2014) or, alternatively, administrative or entrepreneurial (Penrose, 1959). The importance of better explaining the role of a capability in connection with regulatory change is underscored, since regulatory change transforms the position of firms as well as their development of capabilities (Jacobides, 2005). Also, changes in regulations place increased demand on complementary capabilities (Teece, 1986).

7.1 INTERFACES SUPPORT INTEGRATION AFTER A REGULATORY CHANGE

As firms evolve towards increased internal and external integration following a regulatory change, different types of interfaces emerge. The seven actions described in chapter 6 are associated with interfaces and constitute the capability to manage interfaces. Initially, the focus is on

interfaces within individual products and processes. Next, actions related to integration increase, introducing the need for interfaces to manage stability and flexibility as well as the balance between bundles and details. Finally, the integration and the associated interfaces evolve in both internal and external directions. Interfaces now emerge that address the operational boundary relative to customers and external providers. In addition to the above-mentioned interfaces, there is a need for supporting interfaces to understand the regulations and regulators' expectations. The role of interfaces is in line with previous research on how businesses manage the impact of regulatory change (Ferraro & Gurses, 2009; Jacobides & Winter, 2005).

7.1.1 INTERFACES EMERGE AS A BASIS FOR A CAPABILITY

The common characteristics shared by the interfaces that emerge after a regulatory change are that they define how previously unknown interactions take place, articulate the position of the respective functions in the design of solutions, and act to mitigate different requirements that emerge as existing products, processes and technology are supplemented by new options. An interface that emerge when regulations change is a documented approach to connecting separate parts within the firm and/or with the surrounding environment. A challenge in managing interfaces is that they are generally invisible, functioning as links between the interacting parts that they support. The detection of interfaces emerging as a result of increased integration from the impact of regulatory change is a step towards treating the interfaces as just as visible as the parts (products, processes and technology) that were connected.

The description of interfaces above is consistent with previous research, such as the following definition by Jacobides et al. (2006, p. 1203):

> [Interfaces are] the technological, institutional, or social artifacts that allow for two or more independent entities to divide labor. Interfaces are both the catalysts and the evidence of co-specialization between players. They can emerge through conscious action or through happenstance; they both reflect and amplify the division of labor among industry participants.

The architect Christopher Alexander's work on how to establish design patterns (as outlined in his *Notes on the Synthesis of Form*, 1964) articulated early on the importance of interfaces in the form of interaction patterns. Further, interfaces are required to describe the intersection points between inner and outer environments in the process of design (Simon, 1996). From Simon's work, a link to operations and innovation studies can be traced through the outline of design rules (Baldwin & Clark, 2000). Interfaces are here presented as "a pre-established way to resolve potential conflicts between interacting parts of a design" (Baldwin & Clark, 2000, p. 73). In the course of establishing a design (which could be a new product, process or technology), "the detailed interface specifications … need to be set in advance and known to the affected parties"; hence it is important that "interfaces are visible information" (Baldwin & Clark, 2000, p. 73). Interfaces describe in detail how functions in a system interact, including how they will fit together, connect and communicate (Baldwin & Clark, 1997). Interfaces are thereby required for integration to be established on different levels.

7.1.2 INTERFACES WITHIN INDIVIDUAL PRODUCTS AND PROCESSES

Over time, regulatory changes influence interfaces for integration within and across firm boundaries, but the initial impact is limited to within individual products and processes. The initial action taken by firms after a regulatory change is to ensure that the basic compliance requirements are met. Therefore, the focus is on required actions within individual impact areas—i.e., on the products and processes that need to be established or modified. A prerequisite to remain an actor in the industry after the change (or to enter a new market for new products now allowed) is to adhere to the separate requirements for products and processes individually. Otherwise, the regulator will prohibit the firm from participating in the market after the change, since the products cannot be distributed and the processes for supporting and servicing the products are not in compliance with the new regulation. New features are added to products based on the content of the

regulation. Processes will require new steps to fulfil the requirements from the changed regulation, or alternatively, new processes may be implemented. The nature of the requirements from the regulatory change presents a need for products and processes different from those currently offered to the market.

Integration and corresponding interfaces within individual products and processes developed may include links between different product components and individual tasks in the new process. If the products introduced due to new requirements following a regulatory change include multiple components, interfaces between them are needed. The components relate to functions that serve different purposes for the customers in the market, and for them to work as a functioning product, integration is necessary. Correspondingly, a new process is likely to include several individual work tasks. Integration permits the process to function properly in relation to users' needs, and interfaces are required to ensure that the entire flow is working. The function of the interfaces in an individual process is to facilitate hand-overs across different units or departments involved in the process. Attention to interfaces even within individual products and processes is needed since the requirements arising from the regulatory change can be of a different nature from what the firm has been accustomed to managing before the change.

In the case of the Swedish life insurance industry the regulatory change created new requirements for individual products. This means that also the components that make up the product are influenced (Brusoni et al., 2001). The individual influence to assure initial compliance also stretches beyond the product components, and interfaces are needed to connect separate parts (Brusoni et al., 2001). As a result of these changes, processes for supporting the products are affected and new work steps are introduced to facilitate the firm's participation in the market after the change (Dyerson & Pilkington, 2000). The Swedish life insurance firm's implementation of the changed regulation's impact on individual products and processes evolved over time, opening up more options and combinations. A gradual difference from the existing products, processes and technology was developed,

thereby widening the scope of functionality available. In this context, the need to balance stability and flexibility also increases.

7.1.3 THE BALANCE BETWEEN STABILITY AND FLEXIBILITY REQUIRES INTERFACES

Following the initial actions towards requirements within individual products and processes, increased emphasis is placed on integration between the new products and processes and the existing ones. Product portfolio management is visible at this stage to create interfaces between existing products and the new, more or less stable or flexible ones that the customers are starting to utilize. When the combination of new and existing products and processes displays demands for flexibility but also needs to maintain the previous stability, an increased focus on the impact on associated technology interfaces is required. Technology interfaces to balance stability and flexibility involve actions concerning systems architecture establishment and platform extension. Both actions support the use of existing technology in connection with solutions to support new requirements.

A focus on system architecture establishment is required since the new products and processes demand technology support, and since the new technology is connected with the existing technology. Increasingly heterogeneous products and processes need well-defined system architecture with described functions and connections between separate technical components. When the requirements related to the regulatory change have been gradually understood, and when the corresponding products and processes are developed beyond individual solutions for initial implementation, a stable systems architecture foundation can be combined with more flexible system components. The corresponding impact also results in a subsequent need to reconsider the role of the established platform.

The ways in which customers obtain information about products, their subsequent use of the products and their involvement in related processes all require interfaces supporting increased flexibility. In addition to the

actions concerning system architecture establishment, actions are also taken with regard to platform extension. Thereby the stable platform supporting the existing business is extended with additional system components to facilitate flexibility. Hence, impact on the relationship between platforms and individual system components can be triggered by regulatory change, and extending the platform mitigates the tension between stability and flexibility.

In this stage, additional actions can be taken concerning product portfolio management to balance flexibility and stability in both new and existing products. The exposure of new functionality in products introduced in response to a regulatory change creates a risk that customers will lack understanding of the new offerings. Actions are taken here to determine to what extent the available products from before and after the regulatory change should be presented as joint offers to the customers in the market.

Just as this study has documented after the introduction of the fund-based life insurance regulation, new requirements following a regulatory change can alter a previously stable system and introduce flexibility (Abernathy & Clark, 1985). As was the case with the new fund based life insurance relative to the traditional life business, new products and processes created as a result of new requirements can be supported by technology in the form of system architecture and platforms. The co-existence of different products and processes facilitate the impact from regulatory change (Meyer & Dalal, 2002; Tee & Gawer, 2009).

7.1.4 INTERFACES TO INTEGRATE BUNDLES AND DETAILS

A regulatory change introduces the need for products, processes and technology to be broken down in more detail or, alternatively, allows options that are more aggregated than before the change. One approach to deal with aggregating detailed parts of a solution is bundling, where the firm decides which combinations of products, processes and technology to provide. The level of balancing between bundles and details depends on the requirements in the regulation. The development of interfaces in the evolution towards increased integration after a regulatory change is

necessary to maintain a balance between bundled solutions and the introduction of products and processes that are broken down and presented to customers in more detail. When an existing process for a bundled offer towards customers is integrated with a new process that (conversely) breaks down customers' options into more details, interfaces to integrate the two different processes are facilitate to manage the implementation of new requirements.

The interfaces required are related to actions concerning process alignment. Process alignment determines the setup of the interfaces between the new and the existing processes both by allowing for a bundled approach and by exposing details to the customer. This activity, supported by the interfaces, thereby relates the implementation of the new requirements to the existing processes. The interfaces connect functions that are integrated despite the different characteristics of their processes, and support the product connections established to create joint offerings to the market. Process alignment creates understanding of where the detailed exposure of components and the bundled packages can be managed jointly towards the market and customers in processes of distribution, sales and education. Different processes are required for different ways to connect with customers and distributors. The assets required to support the new and existing processes differ, but there are advantages to combining them to improve the firm's position after the regulatory change. The alignment of processes creates possibilities for firms to find new roles in the evolving market after the regulatory change.

As shown by the results of the regulatory change in Swedish life insurance, bundles previously provided by actors in the market might be replaced by detailed options for customers (Cacciatori & Jacobides, 2005). The presentation of such options beside the existing bundles introduces the need for process alignment, to enable customers to understand how to use the functions that now permit their more intense involvement (Cacciatori & Jacobides, 2005). Like in the case of combining guaranteed products with fund-based life insurance, firms achieve success by packaging offers to customers (Ferraro & Gurses, 2009). The basis for a continued evolution towards increased integration between the firm and its customers is

established due to the involvement of customers in the new processes emerging after the regulatory change.

7.1.5 OPERATIONAL BOUNDARY INTERFACES

Towards the end of the evolution over time after a regulatory change, the focus turns to interfaces that address the operational boundary between the firm and adjacent actors. Actions here relate to customer requirement infusion, information sharing and quality certification. To provide for customer involvement following the increase of detailed choice, customer requirements are infused into the functions of the new and existing products. Information sharing is required when the tasks involved in an activity call for information to be processed by several different actors. Quality certification relates to actions that evaluate parts or the whole of a product or process before it is advanced to the market and the customers.

As new products, processes and technology are integrated with the existing offerings, customer involvement increases since the customer has more options to choose from. Customers are also more involved in the decisions related to the configuration of the offering based on products and processes so as to provide more flexibility as a result of the regulatory change. The need to integrate customer requirements in the products that previously have been managed only internally gives rise to new sequences of tasks (and also new tasks). Furthermore, new information is needed to match the customer's functionality requirements to the products provided. In addition, the customers demand information about their specific situation and how it relates to their engagement with the firm and its products. Hence, it is not sufficient to communicate the same general product information for all customers. The actions taken when products previously provided with a pure internal focus demand a change to encompass a focus on specific customers are found in the form of customer requirement infusion. The increased focus on customers is due to the options available for them to make selections within the products available, which has associated repercussions for the management of product support processes and distribution. Tasks that match customer requirements may be

performed with a higher or lower frequency (e.g. daily instead of yearly, or vice versa) as a result of a regulatory change. Customer requirements come not only from the influence of regulatory change on the industry in question, but also from the new requirements arising from regulatory change onto the customer´s business to be translated into solutions acquired from another firm.

The need for increased transparency accompanies the higher level of complexity of products and processes and the deeper extent of customer involvement. As a response to the increased complexity occurring after the regulatory change, interfaces between internal and external products and processes are established and associated actions are taken. The interface between the customer and the firm to infuse requirements serves to channel and translate the customer requirements into the existing products, which had a primarily internal focus before the regulatory change.

Quality certification involves actions in which the firm identifies, evaluates and considers options from different partners and suppliers suitable for the new requirements occasioned by the regulatory change. Both the change in balance between stability and flexibility and the scale of bundling or detailed offerings of products and processes drive the need for such actions. The uncertainty of the functionality and risk involved in the new combinations available creates a void to be filled by actors that can evaluate and certify quality of the combinations (and their content).

Supporting the need to increase interaction with customers, actions towards quality certification follow the need to manage interfaces to share information. When new requirements from a regulatory change emerge, actions are taken to share information that has previously been managed in a purely internal setting within a product or a process. The sharing of information relates not only to customers but also to external providers of products, processes and technology that participate in new forms of collaboration. The new and changed interfaces between internal and external providers highlight the need for information sharing to implement the new products as a result of the new requirements of the regulation.

Regulatory changes often impact access to information (Jacobides & Winter, 2005), as shown by the case of fund-based life insurance, where the

need for quality certification and information sharing arose. The new customer requirements infused as the result of a regulatory change drive the identification of new sourcing arrangements (Salvador et al., 2002). Arrangements between firms can change as a result of increased sharing of information (Jacobides, 2005), as was evident when considering new funds for inclusion in life insurance. A firm dealing with regulatory change may take responsibility for the infusion of customer requirements into products (Brusoni et al., 2001), acting as an integrator between the evolving requirements from the regulation and the customers (Hobday et al., 2005). In this way, the firm balances the requirements that differ across customers, countries or market segments (Karlsson & Sköld, 2007). The firm needs to decide whether to supply the products from internal sources or if external providers can best supply the products (or components) required by customers (Brusoni & Prencipe, 2001).

7.1.6 INTERFACES TO UNDERSTAND REGULATORS AND REGULATIONS

After a regulatory change occurs, firms attempt to understand the impact of the change and define their approach to implementing the new requirements. Each firm needs to understand relationships to other current regulations and what parts of the organization are influenced to determine its approach to implementation. This understanding covers the content of the regulation as it relates to the firm´s products, processes and technology. The interface involved is towards regulators and the content of the regulation, as the firm engages in a dialogue with the regulator (and regulatory documents) to understand the context and details of the requirements. The regulatory documentation is translated into a grasp of how the change impacts the firm.

In addition to considering the regulatory change in itself, the forces behind it also form part of the understanding, since differences in the process leading up to the regulatory change influence the actions taken by individual firms. These forces include lobbying, political desires, deregulation interests and customer requirements. Competitors could act to

infuse requirements related to specific products, processes and technology into the regulatory change. If one's own firm has been involved in the activities leading up to the regulatory change, such activities form part of the understanding of the context of the change. Also, the views of political actors and customers will be reviewed to grasp the potential influence of the change. Strong public advocacy can have a significant impact on regulations. Internal interfaces also exist between the parts of the firm that were active leading up to the regulatory change and those responsible for the implementation of the new requirements, which are not necessarily the same.

The impact of a regulatory change can at first seem minimal on the industry, and firms therefore tend to understand the need for implementation as restricted to a single area, e.g. products. Such voices were heard 1990 in the Swedish life insurance industry. Firms that venture to understand regulatory changes and regulators can achieve a deeper insight of the impact, and consequently can integrate such understanding into their products and processes (Richard & Devinney, 2005). Clear differences were displayed in the actions taken by the six life insurance firms. Working with interfaces to understand regulations and regulators is essential for an individual firm, since the influence exerted by regulations can be difficult to grasp (Tee & Gawer, 2009).

7.2 THE CAPABILITY TO MANAGE INTERFACES

The actions that firms take to manage new requirements from a regulatory change reveal the role of interfaces and the capability to manage them. Interfaces relate the impact of the regulatory change to the firm's existing business, as well as linking external providers to the implementation of the new requirements. The capability to manage interfaces, as a factor in the study of innovation and operations, is complementary to observations of firms' capabilities in complex industries that involve integration and interfaces between products and processes (Hobday et al., 2005), and it becomes more important as one moves beyond technical and operational considerations (Pisano & Teece, 2007).

The capability to manage interfaces entails associating the actions taken amidst the developments after a regulatory change with different types of emerging and changing interfaces, and it supports a more positive and proactive approach when compared to the options of resource minimization, pure compliance or resistance to change (Fox-Wolfgramm et al., 1998; Jacobides & Winter, 2010; Levitt, 1968; Mintzberg, 1984). Teece (2014, p. 328) offered a definition that depicts this function of a capability: "An enterprise capability is a set of current or potential activities that utilize the firm's productive resources to make and/or deliver products and services." The evolution that occurs after a regulatory change is associated (as discussed in sub-sections 7.1.2 to 7.1.6 above) with five different types of interfaces that thereby represent the constituent parts of this capability: within individual products and processes, stability and flexibility, bundles and details, operational boundaries and, finally, understanding regulators and regulations. Hence, as illustrated in Figure 13, the capability to manage interfaces involves utilizing these five different interfaces as resources to make and deliver products and services.

The capability to manage interfaces is not operated as a specific organizational unit, a business process or a technical system function. No statements are made with direct reference to a particular unit or function that manages interfaces. Rather, firms that use this capability do so by addressing the changes in business conditions, which are spread out across various parts of the organization, in a coordinated way. This is consistent with the argument, presented early in this thesis, that to manage the impact of a regulatory change, a firm is compelled to address the new requirements across many of its units, working (for instance) with lobbying, strategy, legal matters and operations of products, processes and technology. The capability decreases uncertainty, improves information sharing, supports controlling the division of labour and resolves conflicts that the new requirements can precipitate.

Figure 13 summarizes a firm's capability to manage interfaces when regulations change. The continuum from internal to external shows the gradual change of focus over time. Table 11 illustrates further the different

types of interfaces contained in this capability with quotations taken directly from the empirical data of this thesis and brief explanations.

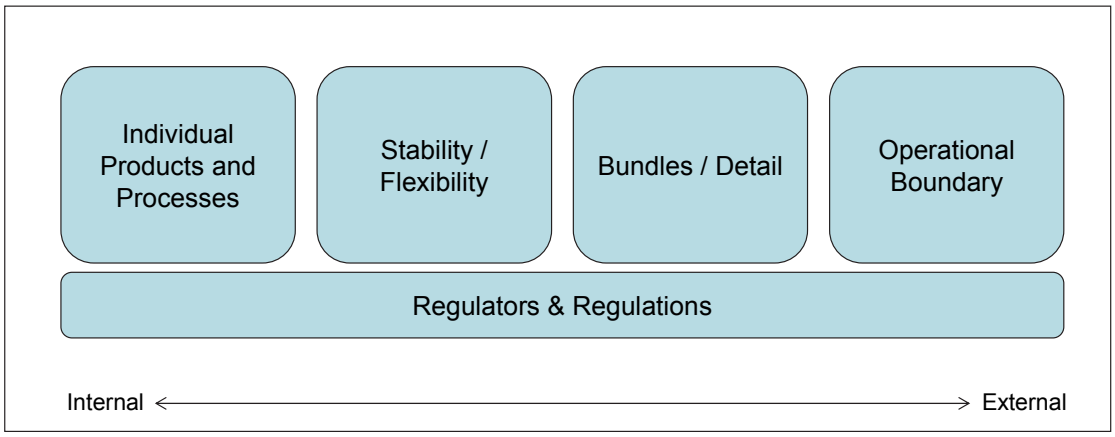

Figure 13. The capability to manage interfaces when regulations change

When the new requirements from a regulatory change are implemented, the implementation serves as a new basis for addressing the next round of regulatory changes. In the current business environment (certainly in financial services, but also in other sectors such as the transportation industry), the queue of regulatory changes is mounting, so it is likely that a constant flow of regulatory changes will need to be managed. By gradually building and investing in the capability to manage interfaces, a firm can effectively consider the complexity of forces behind regulatory changes and the changes themselves so as to determine actions to implement the new requirements in operations. Each time a regulatory change is managed and implemented, the capability to manage interfaces with regulators, regulations, competitors, partners, customers and external providers is strengthened. Also, the capability to manage interfaces supports internal links between new and existing products, processes and technology and the separate parts of the firm that would otherwise be managing the impact of regulatory change in isolation.

Table 11. Illustrations of capability to manage interfaces, taken from empirical data

Capability to manage interfaces	Illustrative quotation	Remark
Understanding regulators and regulations	"We found out who was writing the regulatory text and started a dialogue with him. They were considering how this regulation would look."	An interface with the regulator involving meetings and dialogue to understand the impact of the new requirements.
Individual products and processes	"[We] invested significant resources into the training of the staff with customer relationships concerning the new products and the investments included."	Focus on interfaces between tasks in the process required for the new products consisting of technical documentation.
Bundles / details	"We were independent … and we had a selection process. We had chosen … and you could change funds at any time without fuzz."	Interface in the form of evaluation models to determine the balance between detailed options and a bundled approach.
Stability / flexibility	"We have a broader and more complex product portfolio. This means we need to be more careful in selecting products relative to our marketing."	Challenge with interfaces to balance flexibility and stability including remuneration schemes and education.
Operational boundary	"We were starting in good time, and had the time to consider properly the business model, product offering and the supporting systems."	Interfaces prepared for the commercial, offering and technical connections across the firm's boundary.

The examples in Table 12 provide tangible illustrations of differences between a high and a low level of capability to manage interfaces. The differences highlight the fundamental focus of the capability to manage interfaces, which is to see the interfaces just as much as the individual parts of the business.

Table 12. Illustrations of different levels of capability to manage interfaces

High level of capability to manage interfaces	**Low level of capability to manage interfaces**
We started early, set up the team to deal with the change and established a dialogue with the regulator.	The regulation is not well thought through and it would be better to reconsider and wait.
The offerings need to include a wide range of new options. There are thousands of funds on the market.	It is basically the same products, just a new way of saving. We can offer that from our own asset management.
We need to position the new products beside the existing ones and invest in information and education.	It is difficult to sell the new products when the sales force is well paid on the existing ones.

Note: These statements articulate the views expressed by respondents from case firms, but are not direct quotations.

7.3 THEORETICAL CONTRIBUTIONS

I will now relate the capability to manage interfaces to previous theory, in response to the calls for further research contained in earlier studies. The contributions provide insight that can turn the impact of regulatory change from resistant compliance to advantages for firms. Two contributions are described with respect to what firms do to manage new requirements from regulatory change. First, the description of the capability to manage interfaces adds insight regarding the influence exerted by regulatory change and the management tasks entailed in responding to them. Second, I complement previous depictions of a capability as either ordinary or dynamic (Teece, Pisano & Shuen, 1997; Teece, 2014) or, alternatively, administrative or entrepreneurial (Penrose, 1959). The importance of understanding the role of a capability in connection with regulatory change is significant, since regulatory change transforms firms' position as well as their development of capabilities (Jacobides & Winter, 2005) and place increased demand on complementary capabilities (Teece, 1986). Firms that manage the impact of regulatory change operate their capability to manage interfaces along a scale from ordinary to dynamic over time.

The discussion displays new evidence of the content in a "black box" that was illustrated on a conceptual level in previous research, but not opened up and explained further. The capability to manage interfaces is described as "interface management" in previous research, illustrated in figures as a single box or arrow drawing. Such illustrations are found in works on modular strategies (Richard & Devinney, 2005), product families (Sundgren, 1999) and supply chain strategies in product development (Hartley, Zirger & Kanath, 1997). This lack of further definition has existed despite the indicated relevance of articulating the role of a similar capability in studies of regulatory change and implementation concerning interface strategies (Chen & Liu, 2005), component sourcing (Salvador et al., 2002) and product and service platforms (Meyer & Dalal, 2002). In these studies, the role of a capability to manage interfaces is absent even when interfaces are central to the results reported.

The capability to manage interfaces is identified as supporting actions to manage the impact of regulatory change. How interfaces evolve in periods of change is important for firms' positioning (Brusoni et al., 2009; Ferraro & Gurses, 2009). The constituent parts of the capability to manage interfaces have been presented separately before: individual products and processes (Brusoni et al., 2001; Dyerson & Pilkington, 2000), stability and flexibility (Abernathy & Clark, 1985; Meyer & Dalal, 2002), bundles and details (Cacciatori & Jacobides, 2005), the operational boundary (Brusoni et al., 2001; Brusoni & Prencipe, 2001; Hobday et al., 2005; Jacobides, 2005; Jacobides & Winter, 2005; Karlsson & Sköld, 2007; Salvador et al., 2002) and understanding regulators and regulations (Ansari & Krop, 2012; Richard & Devinney, 2005; Tee & Gawer, 2009). However, they have not previously been combined and represented as a single capability. The capability to manage interfaces complements the understanding of the impact from regulatory change that was depicted leading up to the framing of the research problem in chapter 1.

7.3.1 THE IMPACT OF REGULATORY CHANGE AND THE CAPABILITY TO MANAGE INTERFACES

The capability to manage interfaces shows illustrative evidence of what firms do to manage the impact of regulatory change in the form of dominant design (Anderson & Tushman, 1990), collaboration between firms (Jaspers et al., 2012), the modification of technical requirements (Abernathy & Clark, 1985) and the impact of the expiry of legal protections (Teece, 1986, 2006). The accompanying management tasks (integration in operations, considering relative firm position and understanding industry dynamics) are also better understood by introducing the actions taken by firms in the Swedish life insurance industry. The links between the impact of regulations and management tasks related to the capability to manage interfaces (from individual products and processes to understanding regulators and regulations) are described below and summarized in Table 13.

7.3.1.1 INTEGRATION IN OPERATIONS

The interfaces related to individual products and processes as well as to stability and flexibility explain the influences on technical requirements and the following implementation. The way in which customers obtain information about products and related services also requires interfaces related to changes in technical requirements (Abernathy & Clark, 1985). The unevenness of technological advances requires interfaces to facilitate system integration (Brusoni et al., 2001). In the wake of radical technological change, the task of managing an efficient interface is difficult (Jacobides & Winter, 2005). Technical system booms and extreme changes put demands on the use of internal interfaces (Chen & Liu, 2005). The transfer of customer and regulatory requirements into product specifications that can be met by technological capabilities demands an interface for execution (Brusoni & Prencipe, 2001). Impact on the relationship between platforms and individual system components can be triggered by regulatory change, and the capability to manage interfaces addresses such tensions. The regulatory change in the Swedish life insurance industry created needs for

new technical solutions for administration of the interfaces in the new products, but also between providers of processes and products.

The management task of integration in operations in the form of arrangements within and between firms initially concerned the application of product and process interfaces for the division of tasks in a process and who is delivering the associated products (Cacciatori & Jacobides 2005; Jacobides & Winter, 2005). For operations, the collaboration interfaces concern the arrangements for supply collaboration (Brusoni et al., 2001). Technology interfaces drive implementations of new requirements but are also the result of those requirements (Jacobides, 2005). Examining the capability to manage interfaces helps to explain how regulations influence vertical specialization by analysing what firms do to implement the new requirements due to a change. This in turn explains how firms change as a result in the environment of an integrated system. In the Swedish life insurance industry, successful firms integrated the new requirements concerning products, processes and technology. The task of integration in operations is also linked to the interface that manages bundles and details.

The interfaces to manage bundles and details can be a response to the expiry of legal protection. Firms introduce complementary assets to protect innovation benefits (Teece, 1986), and interfaces can function as a social technology to manage these assets and their complementarity (Teece, 2006). One approach to mitigating changes in legal protection is to provide an interface in order to integrate advice and compliance bundles in products and processes (Richard & Devinney, 2005). The capability to manage interfaces can capture value from innovation even in the absence of support from an intellectual property regime (Pisano & Teece, 2007). The radical implications introduced by a regulatory change in the Swedish life insurance industry dissolved a regulatory protection used to sell products and services with little functional variance. Firms in the industry that applied the capability to manage interfaces included both those formerly outside the industry, which used their strength in management of financial assets, as well as existing firms that managed to leverage prior assets in the life insurance business.

7.3.1.2 CONSIDER RELATIVE FIRM POSITION

Interfaces for operational boundaries as part of the capability to manage interfaces can support mitigation of regulatory limits on collaboration (Jaspers et al., 2012). Interest groups play active roles in defining trajectories for interfaces (Cacciatori & Jacobides, 2005). The interfaces can be defined as relationship-specific assets (Dietl et al., 2009). There are opportunities for innovation in the application of external interfaces (Chen & Liu, 2005). Firms in the Swedish life insurance industry with the capability to manage interfaces were active in facilitating rather than hindering collaboration across the firm's operational boundary. The interfaces established included processes for certifying quality of products and processes for designing remuneration agreements. The tension between an internal focus and an external focus on customers was created by regulatory change, but this tension was lowered through the capability to manage interfaces.

The task of considering the relative firms position appears when change in industry logic after a regulatory change provides options for firms to find new roles in the value chain (e.g. Brusoni et al., 2009; Funk, 2015; Jacobides et al., 2006). As firms' positions change as a result of regulatory change, the product and process interfaces need to be reconsidered (Anderson & Tushman, 1990). In turn, this creates new roles for firms that can be effectively supported by a capability to manage interfaces, which also influences the application and positioning of technology interfaces (Ferraro & Gurses, 2009). The successful firms in the Swedish life insurance industry after the regulatory change ventured to establish interfaces with new external providers as well as becoming providers themselves. The richness of information required in these interfaces illustrates the need for education and training.

7.3.1.3 UNDERSTAND INDUSTRY DYNAMICS

The interfaces established to understand regulations and regulators illustrate the importance of the capability to manage interfaces in processes of standardization (Anderson & Tushman, 1990). The management of

interfaces applies to challenges in overcoming institutional constraints in the form of dominant designs (Ferraro & Gurses, 2009). Dominant designs in the form of standardization and institutional arrangements benefit from the management of interfaces (Jacobides, 2005). The capability to manage interfaces changes the perspective taken to firms approaching a dominant frame of regulators when entering a new market (Gurses & Ozcan, 2014), which affects the interaction between the firms and their customers (Jaspers et al., 2012). Firms executing the capability to manage interfaces in the Swedish life insurance industry mitigated the tension created between flexibility and stability as a result of the evolution of dominant designs.

With regard to understanding industry dynamics, the capability to manage interfaces helps to identify which assets to invest in and which to contract out on the market following the regulatory change (Teece, 1986). Also, technology interfaces provide support for the evolving technical requirements subsequent to a regulatory change (Abernathy & Clark, 1985). The capability to manage interfaces allows firms to take action on multiple levels and not just consider the firm as one unit. Multiple elements of the capability are needed to implement the new requirements, and the entire capability is supported by functions across the firm. All elements of the capability are involved during the period after the regulatory change, thereby contributing to each firm's achievement of a different position from its status before the change.

The capability to manage interfaces supports firms in the processes of integration that often happen in response to changes in regulations. As has been observed, successful firms respond by using the capability to manage interfaces over longer time periods to achieve higher levels of internal and external integration. The link to the empirical observations of the capability to manage interfaces contributing to understanding the problem articulated in the framing of the research is summarized in Table 13. This observation extends previous theory by creating a better understanding of how industry practices such as regulations interact with a company's capabilities to create firm-specific advantages.

Table 13. Summary of the contributions related to the framing of the research problem

The capability to manage interfaces …	**… contributes to understanding framing of the research problem…**		**… by illustrating what firms do to manage the impact of regulatory change, and which actions they take**
	Influences from regulatory change (from 1.4.2)	Management tasks for firms in connection with regulatory change (from 1.5)	High (H) and low (L) level of capability to manage interfaces
Individual products and processes	Technical requirements	Integration in operations	H: Find new components and understand how interfaces work. L: Use similar components as in the old business.
Bundles / details	Technical requirements	Integration in operations	H: Information to adress the increased functionality for customers. L: Limit the display of functionality.
Stability / flexibility	Legal protection	Integration in operations	H: Combine products to single offerings. L: Keep with existing business functionality.
Operational boundary	Firm collaboration	Consider the relative position of firms	H: Find and establish interfaces to providers. L: Try to assemble the solutions as before.
Understanding regulators and regulations	Dominant design	Understand industry dynamics	H: Tight dialogue with regulator on interpretation. L: Postpone change by pointing at problems.

The range of implementation actions that illustrate what firms do to manage new requirements following a regulatory change points to the gradual need for increased integration. Also, this gradual change forces the firms to move from pure compliance with existing regulations into a position of addressing changes in the industry. The capability to manage interfaces when regulations change needs to span a scale from ordinary towards dynamic (Teece, 2014), which means that the capability ought to be both administrative and entrepreneurial (Penrose, 1959).

7.3.2 AN ORDINARY AND A DYNAMIC CAPABILITY

A regulatory change presents two contradicting implications to firms and industries, in that it can both create restrictions for firms and also open up new opportunities for changing the position of the firm. As we have noted, firms that manage the impact of regulatory change are in possession of the capability to manage interfaces. Capabilities have previously been categorized into two types, ordinary and dynamic (Teece, 2014). An ordinary capability is the basis for performing administrative tasks, such as compliance with regulations. A dynamic capability is applied to manoeuvre in a changing business environment and to orchestrate resources (Teece, 2014). The capability to manage interfaces as applied by successful firms after a regulatory change spans a range from ordinary to dynamic, which presents a difficulty for the management of new requirements. Regulations thereby present an opportunity to observe capabilities that have both ordinary (compliance-related and administrative) and dynamic (entrepreneurial) aspects, since the industry and firms' positions will change as a result of the regulatory change. Regulations demand administrative capabilities to comply in an on-going operation, but when regulations change, the required capability shifts towards an entrepreneurial emphasis due to the intricate influences presented (Penrose, 1959). The capability to manage interfaces is thereby related to the possession of institutional assets needed to manage the relationships with regulations and regulators (Teece et al., 1997).

The capability to manage interfaces is therefore both ordinary (administrative) and dynamic (entrepreneurial). Firms in possession of the capability to manage interfaces manage a shift in focus from pure compliance to understanding the impact on new products, processes and technology. The results from the study of what firms do to manage the impact of regulatory change points to the challenge of deploying capabilities that are both dynamic and ordinary.

The sequence of actions after the regulatory change that introduced fund-based life insurance evolved over time from ordinary and administrative towards dynamic and entrepreneurial applications. The approach taken towards managing the impact of a regulatory change acknowledges the way in which patterns of action change over time. Hence, firms need to take action in a dynamic way to implement new requirements that evolve over time. Where this is done effectively, we can observe a supporting capability to manage the evolving interfaces. This activity includes combining both existing and new components of the business as well as external and internal providers. Focusing on the management of interfaces rather than on separate impact areas as a means of integration in operations can show the way to further insight into the impact of changes in regulations on industries and on individual firms.

7.3.3 THE GENERAL VALIDITY OF THE RESULTS ACROSS INDUSTRIES

The study presented in this thesis was performed in one specific industry segment, in one country and covering one limited period of time. Despite these limitations, the study's main contribution, a description of the capability to manage interfaces, is applicable across a wide range of industries. Illustrative examples follow, from the entire financial services industry, from other industrial settings (such as automobiles, environmental technology, the sharing economy and information technology).

An historical view of the Swedish life insurance industry shows 11 major regulatory changes since 1903. In all these instances, the capability to manage interfaces played a role in responses to the change. In half of the

changes, successful firms can be identified and their actions related to the application of this capability.[27] When we broaden our view to regulatory changes across the entire financial services industry, we see many instances where the capability to manage interfaces is observed. Regulations such as MIFID2, IDD and PRIIP[28] all mandate actions across products, processes and technology and changes in the use of external providers, actions that will influence interfaces. The upcoming payments industry regulation Payment Services Directive 2 has significant content concerning the use of interfaces in products, processes and technology.

In other industries, the capability to manage interfaces in connection with regulatory change is also prominent. In the automobile industry, there are requirements concerning emissions that require the use of new products and technology as well as potential use of external providers. New interfaces will emerge in the wake of creating new products and services. The capability to manage interfaces can support the integration of new solutions with existing. In the environmental technology industry, the relationships between actors is changing due to dynamic regulations, which are creating new roles for quality certification and infusion of customer requirements that could prompt applications of the capability to manage interfaces. There are also current and emerging regulatory topics of relevance in the information technology industry. One current example is regulatory changes appearing for the protection of personal data (where integration and interfaces are both extended but also removed). Another contemporary case is the evolution of cloud-based IT consumption. Here changing regulations will demand new forms of integration between new and existing technology, and present new requirements to both the firms delivering the products and services as well as the customers. The emerging requirements for

[27] A more elaborate review of the other 10 major regulatory changes in the Swedish life insurance industry since 1903, indicating the new requirements and reflecting on the use of the capability to manage interfaces, is presented in Appendix C.

[28] MIFID2 is the second Markets in Financial Services Infrastructure Directive, IDD is the Insurance Distribution Directive, and PRIIP stands for Packaged Retail Insurance and Investment Products.

information technology highlights the connection between two areas until now considered ways apart; regulations and digitalization. The capability to manage interfaces will support these arrangements.

7.4 IMPLICATIONS FOR PRACTITIONERS

The topic of regulatory change and its associated impact on operations is highly relevant and current for managers. Three tangible recommendations are offered here for managers who want to improve their approach to managing regulatory change. Also, the topic is clearly of importance to regulators. Are there ways in which they could improve their process of creating regulations and their approach to oversight after the regulations are adopted? A foundation for an alternative approach is presented here.

7.4.1 RECOMMENDATIONS TO BUSINESS MANAGERS

Business managers are under constant pressure to decide on investments to adapt to new requirements arising from an array of changes in regulations. The overarching goal for managers is to establish a consistent, positive and proactive way to address the impact of regulatory changes, and not to avoid or ignore them (Levitt, 1968). Towards this goal, I propose three recommendations. First, allow freedom for regulatory implementation outside current business restrictions; second, over time, link requirements back to the current business; finally, always look outside the firm for providers of solutions to the new regulatory requirements. Focusing on these three recommendations will lead the way to an extended use of interfaces and a better capability to address regulatory change.

When a regulatory change is implemented, freedom should be allowed to consider solutions for requirements related to products, processes and technology outside the restrictions of current business. A free approach to the regulatory implementation avoids instant tendencies to see oncoming restrictions in the current business as an excuse to try to postpone or avoid the regulation. A current example, to be implemented in 2017, is PSD2 (the second Payment Services Directive). The requirements in this regulatory

change go beyond what most financial services companies can deliver with their existing capabilities. The establishment of an entrepreneurial venture to serve the requirements of PSD2 could form the basis for a new business model across the entire enterprise. The successful firms in the market after the change of regulation in the Swedish life insurance industry in 1990 let the regulatory projects establish an independent business.

Although granting freedom to develop new products, processes and technology is a helpful response to new regulations, the requirements should eventually be linked to the current business. Such efforts will allow for better offerings to existing customers and the infusion of the new ideas from the regulatory change into the rest of the business. The example of the regulatory change AMLD4 (the fourth Anti–Money Laundry Directive) is a case where insights from implementing the requirements from the regulation can be infused across the existing business (Valcke et al., 2015). AMLD4 impacts on the information required in the interface with customers, and its implications can also extend across interfaces to service process partners. When the requirements are implemented to support AMLD4, the new processes can be linked to the existing processes to make the entire contact when servicing customers more efficient and engaging. This would be a parallel to the behaviour of the most successful firms studied in the present thesis, which combined products and processes from the new requirements and the existing business.

A regulatory change is an external force imposing requirements that the firm has not considered before. Therefore, it makes sense to look outside the firm for new product, process and technology solutions that go beyond the firm's own abilities to deliver. Eventually relationships with such provides serve as potential partnerships also for the existing business. The fund-based life insurance regulation examined in this thesis offers a clear example of the benefits of looking outside the firm. The companies that were most successful after this change took action to integrate external product and process providers into the implementation of new requirements.

The manager who dares to see regulatory change as a core source of customer requirements, innovation and renewal has a good chance of establishing a position ahead of competitors in the new industry setting established after the change. Also, the capabilities required for a digital business are enhanced. As the next sub-section indicates, regulators can benefit from a revised approach as well.

7.4.2 POLICY IMPLICATIONS FOR REGULATORS

Assuring that firms and industries address regulatory changes in a proper way is the responsibility of regulators. Their organizations have resources at their disposal to verify such compliance. Regulators tend to be organized in silos along two dimensions: towards a specific industry and in terms of geographic boundaries. These tendencies have been described as leading to great attention to detail and lack of co-ordination between different regulations. Based on my observations from a study of the fund-based life insurance regulation, I would like to propose a different perspective for regulators. The actions of regulators as well as of the firms under oversight need to focus on interfaces in addition to the individual parts of businesses (products, processes and business units) subject to compliance.

Following the adoption of a new regulation, the regulators first and foremost work is to ensure specific compliance by individual products and processes. A recommended second focus is to ask the firms subject to oversight not only to comply with specific regulations by completing predefined and narrow checklists, but also to report on the coherence of their regulatory implementation work across different projects. This will enhance companies' attention to their implementation of each regulation in different projects across the entire enterprise. Third, regulators can ask firms to comment about the potential influence on other regulations (both prior and upcoming). This topic is ripe for attention with the emergence of upcoming, complex regulations.

By adopting a more integrated approach, regulators will become more proactive as "architects who engineer and re-engineer the sectors they are responsible for" (Jacobides & Winter, 2010, p. 34). Ultimately, their main

task is to manage the entire regulatory structure of an industry and balance the compliance of firms with appropriate levels of innovation and renewal. The focus will then be more balanced between the individual areas of impact and the detailed content within them (which is central in the system of regulatory oversight today and reported in endless forms and data files) towards also considering the interfaces in the industry subject to regulation. In this way, regulators could establish a regulatory regime that mitigates the risk of future disasters when regulations are ignored or avoided, and instead create an environment where regulations are embraced for the good of society, customers and the firms regulated.

7.5 LIMITATIONS AND FUTURE RESEARCH

The results in this thesis suggest potential areas for future research beyond the limits of the present study. To obtain deeper case insights, longitudinal studies of firms' regulatory implementation activities would be extremely valuable. Such endeavours could further fine-tune the findings revealed by this study's historical research design. The role of technology (and providers of such technologies, including platform providers) related to products and processes in regulatory implementation also merits further research. The events and dynamics occurring in the interfaces connected with customers (including the role of system integrators and certifiers of quality) could also be fruitfully examined. Moreover, the study presented here is focused on one deep exploration of one financial services industry segment over time in one country, so further study of other aspects of the financial services industry is therefore warranted (see e.g. Jacobides, 2005; Jacobides & Winter, 2010). The considerable national and regional regulatory changes now taking place offer ample opportunities for such studies. The study of other regulatory changes could reveal different impact patterns compared to this study, and thereby also be compared across industries.

Taking a similar approach to studying other industries with significant exposure to regulatory change, such as the automobile industry, healthcare and environmental technologies, could also validate the results. Currently there are vivid debates on the role of regulations across industries in the

evolution of the sharing economy, involving business models where system integration is essential (with businesses such as Uber in public transportation and Airbnb in lodging and hotels). These visible, new trends in industry dynamics make regulatory change an important research topic with regard to the role of evolving technologies, changes in customer relationship processes, and how regulatory changes impact business models and thereby customers and society in general.

The importance of future studies on managing the impact of regulatory change requirements and the capability to manage interfaces is perfectly mirrored by the recent developments in business connected to the rise of the Application Programming Interface (API) economy. The evolution of the use of APIs triggers the need to see the management of interfaces as a key task for business, in place of a pure focus on ownership of separate assets. Increasingly, firms are seeking to conduct business in ecosystems where actors exchange information in novel business models. Development of a change in perspective from individual components to interfaces can be strongly driven by regulatory change. One example is the new directive from the European Union concerning the payment services market (PSD2, or Payment Services Directive 2). The new regulation demands that interfaces be established to deliver information that has until now been treated as matters of internal processes. Here the connection between regulatory and digital capabilities could be further revealed. This particular regulatory change offers a promising opportunity to observe the capability to manage interfaces in an emerging evolution of industries and firms.

7.6 REGULATORY CHANGES AND THE EVOLUTION OF INDUSTRIES AND FIRMS

This thesis took as its starting point the importance of regulatory change for industries and firms, and the difficulty in managing implementation of new requirements arising from such change. Several major innovations and alterations (both incremental and radical) in how industries are structured have resulted from changes in regulations. Firms that understand how to apply these change processes to their benefit have the potential to become

winners in an industry. A different approach is thereby formulated compared to resistance and compliance (Fox-Wolfgramm et al., 1998). Within the field of operations and innovation studies, regulations usually appear far down the list as key influencers when compared to evolution in technology, customer demands and internal research and development. This thesis shows that changes in products, processes and technology are influenced by regulatory change, and that challenges as well as benefits are inherent in firms' responses to the associated new requirements. Such changes and challenges are a worthy focus of attention, since their impact is more than tangential, penetrating through every aspect of business. Regulatory change should be recognized more broadly as a source of radical innovation, beyond the incremental changes typically generated by firms themselves (Levitt, 1968). A stronger focus on regulatory change and its impacts on operations could bridge the gaps and perceived conflicts created by the need to satisfy both customers and regulators at the same time (Mintzberg, 1984). As they seek new insights, researchers could benefit by looking at firms as more than "the perpetual ogre, the bad guy who is against good things" (Levitt, 1968, p. 81). New opportunities can be harvested in both academic theory and business practice by focusing on regulations and their impact.

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APPENDICES

APPENDIX A: APPROACH TO THE LITERATURE REVIEW

CONCEPTUAL SEARCH

After an initial discussion with my supervisors and an analysis of the broad topics related to my thesis, 10 articles were identified as classic, fundamental works of central importance to my research. These articles were studied in detail and used to formulate further literature searches to validate the focus on the implementation of requirements arising from regulatory change. The result of this step was a selection of 28 works (16 articles and 12 books) that formed the basis for a further search.

SNOWBALL AND SPIDER-WEB ANALYSIS

The next step was to consider the references contained in the works identified in the first step. I looked both backwards by mapping out the reference lists in these articles as well as forward by searching for later works that cited this particular article. In this way, I constructed a detailed map of all references in the articles and their linkages, which indicated clusters of additional common references of interest. Within the map, I incorporated a horizontal timeline and a vertical domain structure, with the latter reflecting both different dimensions of regulatory change impact and different levels of analysis. Hence, this map gave an indication of clusters of key works and how they related to each other in time and across different fields of study.

IDENTIFICATION OF CENTRAL CONCEPTS (DATABASE SEARCH)

With this information in hand, a series of complementary search operations was performed in literature databases. The sources included academic databases (Scopus, EBSCO, ABI Inform, etc.), Google Scholar[29] and the Stockholm School of Economics literature database. This search yielded 500 articles and books, which were pared to about 100 through a manual review. Comparing these 100 with my original list of 28, in the end 53 articles and 8 books were identified as having empirical focus on regulatory change and implementation of new requirements in firm operations, and these were hence deemed core sources for this thesis.

ANALYSIS OF KEY LITERATURE TO DETERMINE THEORETICAL FRAMEWORK CONTENT

Key sections of the core articles dealing with regulatory aspects were extracted and copied into a single document.[30] This body of text was analysed by considering the most frequent words contained therein. The review identified key constructs, which were consolidated into three main impact areas (products, processes and technology) and two actions across those areas (considering internal versus external providers, and integrating existing and new products, processes and technology). Grouping the key concepts from the articles, as shown in Table A-1, derived the themes.

[29] The function ”cited by” in Google Scholar was used to identify additional works focusing on regulatory change.

[30] The content of each article was searched for relevant words such as regulator, regulation, law, legal, and authority/authorities.

Table A-1. Key concepts and their categorization

Impact areas:	
Products	Product variety, Electric vehicle, Products, Smartphones, Android, iPhone, Product differentiation, New product development, Products, Product life cycle, Electric vehicle, New product development, Modular product, Product innovation, Product architecture, Product architecture
Processes	Sourcing, Supply chain management, Operational performance, Processes, Brands, Processes, Innovation process, Organizational architecture
Technology	Platform, Platform leadership, Disruptive technology, Dominant design, Platforms, Sub-systems, Platforms, Platforms, Technology, Technology
Implementation actions:	
Integrating existing and new	Modularity, Modularization, Information, Modular product, Loose coupling, Modularity, Components, Modularization, Complementary capabilities
Internal and external providers	Industry architecture, Architectural advantage, Sourcing, Common architecture, Supplier/buyer relationships, Interface, Integration, Vertical integration, Architecture, DisIntegration, Complex systems, Interface strategy, Supplier relations, Complementarities, Architecture, Value networks
Other key concepts (not related to above impact areas or themes)	Value creation, Value appropriation, Mobile telephony industry, Strategy, Regulation, Incumbency, Industry structure, Institutions, Entrepreneurship, Institutions, Regulation, Framing contests, Collective action, Relationships, Innovation, Regulation, Luxembourg financial services industry, Relational embeddedness, Reputation, Incumbents, Radical and disruptive innovations, Challengers, New entrants, Industry

APPENDIX B: EMPIRICAL DATA SOURCES

This section contains a comprehensive list of interviews, trade industry magazine articles and books used. Where necessary, the sources are listed with my English translation of the original Swedish title.

PUBLICATIONS PROVIDING CONTEXTUAL DATA ON THE SWEDISH LIFE INSURANCE INDUSTRY

These publications are a source of general data about the evolution of the Swedish life insurance industry from the beginning of the 20th century up to the present. They are listed in chronological order of publication.

Englund, K. (1982). **Insurance and mergers 1855–1980** (Försäkring och fusioner: Skandia, Skåne, Svea, Thule, Öresund: 1855–1980), Skandia

Grip, G. (1989). **Insurance in transformation: Nine essays on the current Swedish insurance industry** (Försäkring i förändring: nio uppsatser om nutida svensk försäkring), Assurans Förlag

Frennberg, P., & Hansson, B. (1989). **Should insurance savings be made in shares?** (Ska försäkringssparande ske i aktier?), Ekonomisk Debatt, 3/89

Risk & Försäkring. (1990). **I prioritize insurance in the new organization** (Jag prioriterar försäkring i den nya organisationen), interview with director of Finansinspektionen (financial services supervisor)

Bergendahl, G., Hartman, T., & Lindblom, T. (1990). **The finance and insurance industries towards the year 2000** (Finansierings- och försäkringsbranschen inför år 2000), Statens industriverk / Nordstedts

Grip, G., & Berg, L. (1992). **Convergence of the banking and insurance industries: An overview and introduction** (Branschglidning mellan bank och försäkring: en översikt och introduction), Folksam

Grip, G. (1992). **The trust of the insurance-demanding public: Seven essays on Swedish insurance** (Den försäkringsbehövande allmänhetens förtroende: sju uppsatser om svensk försäkring), Assurans Förlag

Englund, K. (1993). **Skandia men and other insurance men: Fifty biographical studies** (Skandiamän och andra försäkringsmän 1855-1970: femtio biografiska studier), Skandia

Bromander, C., & Linde, U. (1993). **Individual pension savings** (Individuellt pensionssparande), Nordisk Försäkringstidskrift, nr 4 / 1993

Boksjö, A., & Lönnborg-Andersson, M. (1994). **Collaborative and competitive institutions in the Swedish insurance market**, Nordisk Försäkringstidskrift, nr 2 / 1994

Norgren, C. (1994). **Swedish insurance in international perspective** (Svensk försäkring i ett internationellt perspektiv), Nordisk Försäkringstidskrift, nr 3 / 1994

Bergendahl, G. (1994). **How to sell insurance in a bank** (Hur man lyckas med att sälja försäkring i bank), Nordisk Försäkringstidskrift, nr 3 / 1994

Grip, G. (1995). **Pensions, ownership and power** (Pensioner, ägande och makt), Nordisk Försäkringstidskrift, nr 3 / 1995

Bozic, B., & Karlsson, L. (1997). **Strategies for pension insurance: Three case studies** (Strategier för pensionsförsäkringar: tre fallstudier av Skandia, Trygg-Hansa och Wasa), Nordisk Försäkringstidskrift, nr 3 / 1997

Englund, K. (1997). **The corporate structure within Swedish individual insurance, 1950–1980** (Företagsstrukturen inom svensk enskild försäkring 1950–1980), Nordisk Försäkringstidskrift, nr 4 / 1997

Hägg, G. (1998). **An institutional analysis of insurance regulation: The case of Sweden**, Lund, Nationalekonomiska Institutionen

Lindskog, D., Norrby, J., & Wolrath, B. (2000). **Insurance companies as actors in the financial markets** (Försäkringbolagen som aktörer på den finansiella marknaden, In C. Bratt, A. Kleverman, & E. Strömbäck (Eds), **The future of Swedish insurance** (Svensk försäkrings framtid), Svenska Försäkringsföreningen

Lönnborg, M., Boksjö, A., Fälting, L., & Olsson, M. (2003). **Institutions and organizations in the Swedish financial market** (Institutioner och organisationer på den svenska finansiella marknaden). In Y. Hasselberg & P. Hedberg (Eds.), **In the same boat: Essays in financial and corporate history dedicated to Mats Larsson** (I samma båt: uppsatser i finans- och företagshistoria tillägnade Mats Larsson) Uppsala studies in economic history, 0346-6493; 65, Acta Universitatis Upsaliensis

Larsson, M., Lönnborg, M., & Svärd, S-E. (2005). **The rise and fall of the Swedish insurance model** (Den svenska försäkringsmodellens uppgång och fall), Svenska Försäkringsföreningens förlag

Lindmark, M., Andersson, L-F., & Adams, M. (2006). **The evolution and development of the Swedish insurance market**, Accounting History Review, 16:3, 341-370

Larsson, M., & Lönnborg, M. (2007). **Mutual insurance in the Swedish insurance model** (Ömsesidig försäkringsverksamhet i den svenska försäkringsmodellen, Nordisk Försäkringstidskrift, nr 1 / 2007

Eriksson, L. (2008). **The making of the Swedish life insurance market 1855–1914**, Licentiate Thesis, Occasional Papers in Economic History No. 15, Institutionen för ekonomisk historia, Umeå Universitet

Eriksson, L. (2011). **Life after death: The diffusion of Swedish life insurance—dynamics of financial and social modernization 1830–1950**, PhD Thesis, Department of Economic History, Umeå University

Erlandsson, E., Friman Blomgren, L., & Ström Olsson, K. (2013). **The changing world and the role of the insurance industry** (Omvärld i förändring – försäkringsbranschens roll), Svensk Försäkring (Insurance Sweden)

Swedish Insurance Yearbook, published by the Swedish Insurance Association (1990–2005)

Annual reports of the six studied companies, when available, 1990–2005

SOURCES WITH DATA ON FUND-BASED LIFE INSURANCE AND THE REGULATORY CHANGE

The sources listed here contain insights related to the regulatory change that resulted in the birth of the fund-based life insurance market.

Axelsson Udén, K., & Pettersson, Y. (1991) **Unit-linked insurance in Sweden and the UK** (Unit linked eller fondförsäkring i Sverige och Storbritannien), IFU

Grip, G. (1991). **The issue of unit-linked insurance: On life insurance with links to securities funds** (Fondförsäkringsfrågan: Om livförsäkringar med anknytning till värdepapper), Assurans Förlag

Dagens Industri. (1991). **The mess in unit-linked insurance** (Unit linked röran), March 7

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PERSONAL INTERVIEWS

Table B-1. List of personal interviews

Company	Title / Function	Date	Length
Skandia	Manager, information technology	2008-11-17	1.5 h
	Manager, business development	2009-03-25	1 h
	Manager, business operations	2012-05-30	1.5 h
SEB	Manager, business development	2008-10-13	2 h
	Manager, product development	2009-01-18	1.5 h
	Manager, customer services	2012-05-23	1 h
Länsförsäkringar	Manager, business development	2008-11-14	1 h

Company	Title / Function	Date	Length
	Manager, information technology	2011-10-27	1.5 h
	Manager, sales and marketing	2011-10-27	1 h
Folksam	Manager, business development	2008-11-11	1.5 h
	Manager, information technology	2010-09-01	1 h
	Manager, product development	2014-10-02	1 h
Nordea	Manager, business development	2009-01-19	1.5 h
	Manager, product development	2012-05-30	1.5 h
	Managing director, life insurance	2015-08-30	1 h
Swedbank	Manager, business development	2008-11-27	1.5 h
	Manager, product development	2010-02-05	1 h
	Manager, customer services	2010-12-10	1 h
Swedish life insurance industry level	Head of business development, life insurance company	2009-02-25	1.5 h
	Independent industry expert (IT vendor)	2010-02-20	1 h
	Head of information technology, large insurance company	2010-04-06	1.5 h
	Research findings feedback session (3 different company sessions)	September–October 2010	1 h each

Company	Title / Function	Date	Length
Financial services industry level	Research findings feedback session (6 different company sessions) Industry research findings presentation (7 industry participants) Business development team, major bank Business development team, major bank Business development and IT solutions design team, financial services group	September–October 2010 August 2009 November 2009 December 2011 October 2010	1 h each 3 h 3 h 2 h 2 h

INTERVIEWS IN TRADE MEDIA

These interviews are detailed, deep and open conversations with officers of the life insurance companies conducted by industry-focused trade media sources. Reporters with specific industry insight led the conversations, and therefore the interviews contain detailed accounts of the actions taken by the firms.

The titles of the magazines are abbreviated as follows:

R&F = *Risk & Försäkring* published by Svenska Nyhetsbrev

DI = *Dagens Industri*, daily business newspaper

VA = *Veckans Affärer*, weekly business newspaper

SvD = *Svenska Dagbladet*, daily newspaper

FT = *Försäkringstidningen*, monthly trade magazine

Table B-2. List of interviews in trade media

Company	Magazine title and year	Article headline (translated from the original Swedish title)
Skandia	DI, 1990	Unit-linked insurance is seen as a revolution on the life market
	R&F, 1992	Skandia aims for new combination product
	R&F, 1992	Unit-linked insurance 1991: A total loss of 500 MSEK
	R&F, 1997	Anders Kvist on changes at Skandia Liv
SEB	DI, 1991	SEB is the winner: has 90% of the unit-linked market
	VA, 1991	Fund-based insurance: One out of seven has succeeded but all are optimists
	R&F, 1992	Unit-linked insurance 1991: A total loss of 500 MSEK
	R&F, 1992	SEB Insurance wants to become a large actor in corporate pensions
	DI, 1993	SEB is dominant on the unit-linked market
	R&F, 1994	Anders Mossberg, CEO of SEB Insurance: Tax changes
Länsföräkringar	FT, 1990	Fund savings is popular
	R&F, 1992	16% of the market: push forward for Wasa in unit-linked insurance
	R&F, 1992	Unit-linked insurance 1991: A total loss of 500 MSEK
	R&F, 1994	Wasa launches corporate pensions after the summer
	SvD, 1996	New mixed insurance from Wasa
	R&F, 1998	Lars Roos on the future of Wasa
Folksam	R&F, 1995	Folksam starts own unit-linked company in the summer
	R&F, 1998	The background of the divorce between Folksam and Föreningssparbanken
	R&F, 1994	Håkan Tidlund on the continued change work at Folksam
	R&F, 1994	Gunvald Grip on the plans for Folksam Fund (Fond) and

Company	Magazine title and year	Article headline (translated from the original Swedish title)
		Folksam Savings (Spar)
Nordea	R&F, 1991	Livias unit-linked comes this autumn—if the stock markets performs well
	R&F, 1992	The setup of Nordbanken's unit-linked funds
	R&F 1997	Nordbanken is interested in life insurance
	R&F, 1997	Nordbanken plans for Swedish life insurance products with Merita
	R&F, 1997	The fusion of Merita and Nordbanken opens up space for Finnish savings products in Sweden
	R&F, 1999	The new business area managers of Livia teach Nordbanken employees to sell insurance
Swedbank	R&F, 1992	Unit-linked insurance 1991: A total loss of 500 MSEK
	R&F, 1995	The insurance profile: Sparliv and Sparfond set priorities
	R&F, 1998	Peter Nilsson on the future of SparFond
	R&F, 1998	The background of the divorce between Folksam and Föreningssparbanken

APPENDIX C: MAJOR REGULATORY CHANGES IN SWEDISH LIFE INSURANCE

This appendix describes 11 major regulatory changes in the Swedish life insurance industry since 1903. Numerous other, smaller regulatory changes (e.g. the Insurance Acts of 1917 and 1982) are not covered. Following this set of descriptions, I examine current regulatory changes in the pipeline, both in Sweden and within the European Union. This picture emphasizes the current relevance of this study, since an increasing amount of regulation is in store for this industry. It is clear that the pace of and complexity inherent in regulatory changes is increasing exponentially over time.

1903: THE FIRST INSURANCE LAW

Before this law was introduced, oversight of the insurance industry was integrated in the regular legal system, with little possibility of taking specific actions towards imprudent behavior by insurance companies. It was up to the Royal Majesty as approver to formulate oversight for each firm separately. A gradual realization that the industry needed further oversight was apparent in the royal insurance decree of 1886 and the proposed bill of 1897.

The new law of 1903 had common traits for all different actors and was similar across the Nordic countries. The main purpose was to create economic protection for policyholders by stating requirements for open publication of the economic affairs of the insurance companies. Also, at this point a special authority, Försäkringsinspektionen (the insurance supervisor), was established.

The implications could be seen as incremental since the law instituted what had been in practice before. The main impact was on processes, since new reporting requirements were instituted. An implication for products was that better understanding was required to define the parties involved in the contract and their roles and relationships. Changes in the customer's rights in the relationship with the insurance company influenced the processes related to customer contacts.

Due to increasing concerns over high cost levels and incorrect use of customer funds, a debate over nationalization (state ownership) of the insurance industry began. Moreover, a low-interest environment was making it difficult for insurance companies to fulfil their promises of return on assets (a situation that has been repeated in recent years).

The new law covered principles of solvency, the need for insurance, separation of duties, influence of policyholders and levels of reasonable profit. A final principle was that insurance companies could not perform any other type of business.

The solvency requirements contained more specific instructions on both how much assets the companies needed to own in relation to their commitments to customers, and the type of assets that they could invest in. Certain tendencies towards more liberal rules for how to invest were introduced, e.g. that there could be more investment in the equity markets. Levels of reasonable profit in relationship to services provided were introduced. This was a reaction to perceived increases in profit margins from products offered. The possibility of distributing profits to shareholders was limited in the new law, but this was of minor importance since such distribution was rare anyhow. This ban on distribution was further specified in a specific law in 1983. The law finally provided for the formal representation of customers (insurance policyholders) in the governance of the companies.

The main implications of this law related to the possibility of investing in different types of securities, embedded in the investment component of products with more freedom, and also the need to calibrate charges with the services provided to maintain reasonable profit levels. This change could be seen as an industry-wide innovation in service processes within asset management. In addition, the additional reporting requirements influenced processes. The centre of impact from this regulation was in defining the processes of customer influence on life insurance companies.

1960: A PUBLIC PENSION SYSTEM

After a two-decade-long political debate (including calls for socialization and state ownership of the industry), the public pension system was launched as ATP (Allmän Tilläggs Pension, or common supplementary pension) in 1960. The main new element of this system was a mandatory pension fee delivered by the employers into special funds. The funds established were state controlled asset management organizations, which were responsible for securing reasonable growth of the capital as well as provide pay-out of pensions at maturity. These organizations are still in existence as "AP funds". The fear from the life insurance industry was that the state pension would limit the market for private pensions. However, the effect was the opposite: due to evolving agreements between organizations in the labour market, new and complementary products and solutions were developed. The common name for these solutions is *tjänstepensioner* (occupational pensions). This was in principle a private version of the agreed state pensions, with a common fee taken out of the salary amount and managed in a common fund for all employees of an industry or trade association. Seven such arrangements were reached in the first phase. This growth of private occupational pensions can be seen as an interesting process in the wake of a new regulation. The regulation created a visible need for product innovations. The process involved the creation of new products and the establishment of new actors as well as new relationships and service processes.

1990: FUND-BASED LIFE INSURANCE REGULATION

This new regulation was inspired by the growing mutual fund industry, which had become very popular in the 1980s in Sweden thanks to tax incentives and stock market performance. In addition, the US and UK had seen the development of life insurance products linked with mutual funds investing in the stock market. Since this regulatory change is the topic of the present thesis, no further details of the implications will be outlined here.

1990: INDEPENDENT DISTRIBUTION ALLOWED

In the same year in which fund-based life insurance was introduced, Sweden also authorized independent distribution of insurance products. This opened up the field to a range of new actors such as brokers, agents, investment advisors and asset managers. This change in regulations was a reaction towards the "cartels" in existence on the insurance market (yes, the arrangement was actually called that in public!), which the insurance industry had established to monitor how life insurance was distributed. Some life insurance companies used this new option in parallel with their existing (proprietary) distribution channels.

As a result of this change, products needed to be adjusted to provide for remuneration to the external distribution companies, which was a cost that had until then been packaged into the overall administration cost of the entire company. This also required skills to change processes since the new distribution outlet was managed in sync with the existing internal channels, where slightly different versions of products were applied. There were also demands for new processes concerning education, information and advising.

1999: PENSION REFORM

As a continuous link from the ATP system launched in 1960, a new pension reform was launched in the form of a 1999 law. The fundamental reason for change was the evolution of funding of the system, under which the funds paid in were insufficient to support the promised payout levels. Changes in factors such as the pension age, the relationship between paid-in premiums and pensions provided, and the level of fees contributed was introduced. In essence this was a move from a "pay as you go" system to a funded arrangement.[31] One major new component was the introduction of the premium fund-based pension system (PPM). This was (and still is) a variable savings component in which 2.5% of salary is allocated to a fund account, where the individual is responsible for the allocation of the savings to

[31] The problem that the institution giving a pension promise does not hold the proper reserves for these future payments remains an important topic for countries, municipalities and companies today.

different security funds (from emerging markets equity funds to guaranteed interest rate accounts). The supply of funds is overwhelming: around 700 options exist today, and several services to package and manage these choices are provided by actors on the market.

The implications from this major change can be divided into two perspectives. On the one hand, there was a limit to firm activities, since the need for pensions was taken over by the state. On the other hand, the increased sophistication of the premium pension selection process triggered efforts by life insurance companies to improve the content of their own products and service processes in relation to the number of funds available as well as the packaging of these products into understandable service offerings. Also, new intermediaries entered the market to support the selection process. They were outside the control of the life insurance companies but had implications for distribution processes.

2000: LAW FOR PROFIT DISTRIBUTION

The Law for Profit Distribution (*Vinstdelningslagen*) in 2000 replaced the ban on profit distribution by insurance companies established in 1983. This regulation allowed firms to change their legal arrangements from mutual ownership (by customers) into shareholder firms. Some firms (e.g. Handelsbanken and SPP) decided to pursue the change, whereas many others did not. One firm took both routes with two different subsidiaries (one remaining mutual and the other set up as a shareholder-owned firm).

The changes had direct implications for products, since a new design was required to adhere to the new business model. There were also new requirements in processes and distribution arrangements due to the implications for how products could be designed.

2004: THE LAW(S) ON FINANCIAL ADVICE

Due to its responsibility for managing consumers' savings, the life insurance industry is under scrutiny from regulators regarding the quality of financial advice given. This was formally instituted in the Law on Financial Advice, enacted in 2004. The fundamental provision of this law is the requirement

to document advice given, so that there can be proof of what advice was given at what time. In addition, the advisor representing the life insurance company or acting as an independent agent must have proper knowledge. The evolution of regulations on this topic was taken further by the adoption of the EU Markets in Financial Instruments Directive (MIFID), where it is stipulated that financial services firms should have a proper classification of customers in order to calibrate their advice properly. This is known as "KYC" (Know Your Customer). The Swedish law was further amended in 2007 in accordance with these developments. Debate continues regarding the quality of the current regulation and whether there should be stronger protection for the customers or if such protection is limiting the services provided to the market by financial services firms.

The implications of this regulatory change for distribution processes are significant. There is a need to increase transparency, which influences processes for information handling. Also, there are challenges in product management, due to the need to provide different products to different segments (depending on the customer's knowledge level, the degree of risk in the product and the consequent complexity).

2008: CORPORATE PENSION SELECTION MARKET

As a consequence of the changes in 1990 and 1999, there was an introduction of what could be described as collective "list purchasing" (this process is also referred to as "ITP 2", i.e. the second generation of collective pension solutions). This was an initiative by actors in the labour market (unions and employer associations). Hence, this was not a regulation instituted directly by regulators, but an example of self-regulation with significant effects on the industry.

The implications of this regulatory change were seen in that products needed to be managed in a portfolio with modified versions for the new "low-price" channel. Also, there was a change in the processes of customer relationships, with the inclusion of a new party in this process. The new processes influenced service administration as well.

2011: SOLVENCY 2

Implementation of the EU's Solvency 2 regulations began in 2011. This took place with inspiration from the evolution of banking regulations in the form of Basel 2 (currently updated to Basel 3). After subsequent modification of the timetable, companies devoted renewed energy to this project in 2014–2015, to be ready for implementation as of the beginning of 2016.

The regulation's content covers the management of investment capital and solvency, governance and reporting. These requirements are manifested in three pillars. The first pillar regulates the calculation formulas for how much capital the insurance company needs, given the structure of its business and the risks undertaken. The second pillar deals with the management of risk across the enterprise. This concerns (of course) insurance risk, but also the risk inherent in processes and investments. A formal guide for this management has been issued as ORSA (Own Risk and Solvency Assessment). The third pillar can be categorized as the output section, since it deals with reporting in the form of over 100 reports for each legal entity subject to the regulation. This is the most comprehensive regulatory change in the lifetime of the life insurance industry, and its implications have been noticed across the entire range of issues concerning products and processes.

2014: FATCA

The Foreign Account Tax Compliance Act (FATCA) is a US law that requires US persons, including individuals who live outside the United States, to report their financial accounts held outside of the US. It also requires foreign financial institutions to report to the Internal Revenue Service (IRS) about their US clients. The regulation is implemented through agreements, which involve service processes, and customer relationships. The implications for products have been incremental.

CURRENTLY EVOLVING REGULATORY DISCUSSIONS

The history of Swedish life insurance has been influenced by many regulatory changes. Despite the rich list of historic regulations the future looks to provide even more regulatory change to manage. Accordingly, I close this appendix with comments on two important, on-going regulatory discussions. In addition current EU regulations under development with impact on the life insurance business are described.

LIFE INSURANCE ACCOUNT TRANSFER RIGHTS

This debate can be summarized under the heading of *flytträtt* (meaning the right to move life insurance accounts from one provider to another). Until 2007, there was very limited possibility for a customer to withdraw capital from one life insurance company and move it to a competitor. This was due to a mix of tax implications as well as how products were designed and how the allocation of profits was calculated. The current debate is polarized between two sides. One side, arguing against the right to move, says that too much flexibility will limit the possibilities to establish plans for long-term asset management in the funds supporting life insurance, whereas the other side argues for freedom of choice and increased competition in the market.

The implications for products from the changes in this domain could be significant. The ways in which products are designed and how the customer might choose to invest could be influenced. Any such change would also have effects in the area of technology supporting the process of moving capital between companies (potential development of a common process for this activity could be foreseen). Also, the distribution and support processes currently in place would need significant adjustment.

LIMITS ON REMUNERATION FOR DISTRIBUTION

Since the introduction of the possibility to use independent distribution for life insurance, remuneration components have been linked to these arrangements. To be chosen as an alternative by the independent distributor (who can have several options on his or her list), the life insurance companies offer a commission for the sale of products to the end customer

(pension holder). In addition, the intermediary provides services in connection with the life cycle of the agreement (investment advice, tax calculations, etc.). Based on the evolution of regulation in other countries (such as Finland, where sales-oriented remunerations are not allowed) there are discussions in Sweden about a ban for commissions in connection with the sale of a life insurance product. Certain actors argue for such a ban, with the main proposition being that the agents are not acting with the interest of the customer in mind, but rather considering the most profitable solution for themselves. Supporters of keeping the established system point to the risk that there will be a weaker counter-force against the powerful life insurance companies (especially those that have their own and powerful distribution force, like the major banks).

If there is a change in the current regime, the implications for products and processes could potentially be large due to changes in the design of business models.

CURRENTLY EVOLVING EU REGULATIONS WITH LIFE INSURANCE IMPACT

Within the EU, three additional regulations are under debate with relevance to the Swedish life insurance industry: PRIIPS, IORP2 and IDD. These regulations are part of an evolution resulting from the events that occurred in recent financial system crises.

PRIIPS (Packaged Retail and Insurance-Based Investment Products) intends to mandate provision of information to customers of financial products so that they understand what they are buying. IORP2 (Institutions for Occupational Retirement Provision) adds new requirements for corporate governance and information presentation to organizations providing pensions to employees of firms. IDD (Insurance Distribution Directive) is an extension of a regulation implemented in 2002. It would provide further guidance regarding sales of life insurance to customers and associated advising.

See Table C-1 on the next two pages for a summary of the impact of the major regulatory changes on products, processes and technology, including the indicative evidence of the capability to manage interfaces.

Table C-1. Impact of major regulatory changes affecting the Swedish life insurance industry since 1903

Area of impact	**1903 law**	**1948 law**	**Public pension**	**Independent distribution**	**Pension reform**	**Profit distribution**
Product	Roles defined in contract	Assets included	Corporate pensions	New	New External / Internal Stand-alone	New Impact on old vs new products
Process	Customer rights clarified	Influence of customers defined Asset management introduced	Firm-level customer relationships and service processes	External distribution Existing customer relationships (changed) Integrated service processes	External distribution Existing customer relationships (changed) New service processes	Existing customer relationships influenced New service processes
Technology	New reporting	New reporting	New solutions	New support for remuneration	Information exchange	Integration of existing and new
Evidence of capability to manage interfaces	Show under-standing new ways of engaging with client	New asset classes to be integrated in processes of asset management	Relationships with new buyers to understand life insurance	Agreements with agents and brokers established	New roles for customers Products more transparent	Interfaces between products and processes change due to price adjustments
Winners	Skandia	Skandia, Folksam	No evidence	Skandia, Swedbank, SEB	Folksam	Skandia

Area of impact	**Financial advice**	**Corporate pension**	**Solvency 2**	**FATCA**	**Transfer rights**	**Distribution of remuneration**
Product	Segments and versions	New Segments and versions	Impacted	Minor impact	New calculations New dimensions	Will impact pricing of products
Process	Radical change in distribution New service processes	New distribution relationships Major change in customer relationships New service processes	Document service processes	Modified customer relationships Service process controls	Increased power of customer choice Moving capital	Major impact on distribution arrangements Modified customer relationships
Technology	New solutions	Interfaces	New information platform	Processes documented	New solutions	Calculations of remuneration changes
Evidence of capability to manage interfaces	New roles for use of external advisors	Change in interface with administrative channels for life insurance	Interfaces in reporting changed	Relations to tax authorities and regulators changed	New actors enter to manage customer agreements	New interfaces and renegotiation of existing ones
Winners	SEB	AMF, Skandia, SEB	Too early to assess	Too early to assess	Too early to assess	Too early to assess

APPENDIX D: OTHER AUTHOR PUBLICATIONS RELATED TO REGULATORY CHANGE

In the course of my research journey, I have done considerable work on the impact of regulatory change in the life insurance industry. This work lies outside the scope of this thesis but still has relevance to the present topic. My other publications are summarized here. The conferences at which I presented papers were all peer-reviewed academic events. The descriptions below are the abstracts from the version presented.

STUDIES OF INNOVATION IN FINANCIAL SERVICES (INCLUDING REGULATIONS AS A FORCE)

This work served partly as a pre-study for defining the topic of this thesis. The scope was the entire range of innovation sources across the full range of the financial services sector. As a result of this study, regulations were identified as a key topic and Swedish life insurance as a suitable market for empirical study.

"MAPPING THE WINDS OF CREATIVE DESTRUCTION IN THE NORDIC FINANCIAL SERVICES INDUSTRY" (WITH M. SKÖLD), INTERNATIONAL PRODUCT DEVELOPMENT MANAGEMENT CONFERENCE, TWENTE, 2009

The financial industry is regularly launching new advanced solutions and could therefore be depicted as creative. However, the recent fall of established firms could be labeled as destructive. Another way to look at the industry is that the same products are sold now as 500 years ago. How are the winds of creative destruction blowing in this industry, and why? To understand this, innovation examples were mapped into an established framework. To gather data, deep qualitative interviews were performed with managers in the financial services firms. The conclusion is that to understand innovation patterns in the industry, several layers of the industrial architecture need to be managed. The key implication for managers is that large and small firms need to manage innovation differently to balance resource access with ability to move quickly in the market.

"SOLVING THE INNOVATION PUZZLE: A FRAMEWORK FOR CONSISTENT INNOVATION IN BANKING AND INSURANCE" (WITH C. BIECK), IBM INSTITUTE FOR BUSINESS VALUE, 2010

For the past 500 years, the banking and insurance industries have struggled to balance innovation with stability and conventionality, and innovation has suffered as a result. The incremental innovation of the past is not sufficient in today's rapidly changing world. To successfully exploit innovation today, banks and insurers need to better understand its sources and develop a framework to help them innovate consistently and reliably.

"TYPES OF INNOVATION IN DIFFERENT LAYERS OF INDUSTRIAL ARCHITECTURES" (WITH M. SKÖLD), CONTINOUS INNOVATION NETWORK CONFERENCE, ZURICH, 2010

This paper elaborates on whether different positions in the value chain affect what type of innovation companies can accomplish. The theoretical base is grounded in literature on industrial architecture and different types of innovation. From a sample of 14 cases, an analysis identifies clear differences in perspectives between radical and incremental innovation. Radical innovation is dependent on firms' relationships with regulatory bodies, such as authorities with power to perform inspections as well as ministries designing rules and regulations for an industry. On the other hand, incremental innovation is controlled and executed by firms themselves.

CHANGE IN THE CORPORATE PENSIONS MARKET

The major change in the corporate pension market in 2007 is treated as a regulatory change, even if it did not emanate directly from the acts of the regulator. It can be viewed as a result of previous changes in regulations that prompted actors with an influential standing to create changes in the industry value chain. The event is further described in Appendix C.

"RELATIONSHIP APPROPRIABILITY AS SUPPORTING INFRASTRUCTURE FOR PRODUCTS AND OPERATIONS INNOVATION" (WITH M. SKÖLD), CONTINOUS INNOVATION NETWORK CONFERENCE, BUDAPEST, 2014

This research contributes to insight into how firms can benefit from innovation by exploring the role of relationships as assets. A longitudinal case study in an industry with a weak appropriability regime is presented, following a major structural and regulatory transition that changed the roles of actors and their relationships. Empirical data over seven years from archives, industry publications and interviews are used to depict how positions changed and how this change happened. The analysis reveals and specifies the concept of relationship appropriability as a link between complementary assets and surrounding supporting institutions such as regulations and regulators. This concept complements previous findings on the role of assets, capabilities and relationships in innovation in products and operations. Managerial implications include how firms can act when an industry changes from an individual customer value-based model to a system with price focus and central integrators.

"INCUMBENTS AS COLLECTIVE ENTREPRENEURS: A MISSING LINK TO UNDERSTAND THE BENEFIT OF COMPLEMENTARY ASSETS" (WITH M. SKÖLD), INTERNATIONAL PRODUCT DEVELOPMENT MANAGEMENT CONFERENCE, GLASGOW, 2016

The study reports on how firms can create leading positions relative to innovative entrants despite a weak appropriability regime within established and mature industries. The research design was based on a longitudinal case study in the financial services industry following a major transition. Data were collected from multiple sources, capturing a seven-year change process. Interviews with life insurance firms, consultants, technology vendors and insurance advisors provided secondary data. The study identifies six areas as specifically important in handling threats from new entrants. Findings add to the theory of complementary assets. Furthermore,

the analysis identifies a focus area not specifically addressed previously in the literature on complementary assets, namely the role of incumbent collective entrepreneurship to secure appropriation of profits from innovation.

SOLVENCY 2 REGULATION

This change is a major implementation of a European Union directive that took effect in 2016. The study described below concerns the preparations for and understanding of the regulation. The event is further described in Appendix X.

"BUSINESS MODEL DYNAMICS FROM REGULATORY INNOVATION" (WITH M. SKÖLD), CONTINOUS INNOVATION NETWORK CONFERENCE, STOCKHOLM, 2015

The growing interest in business models has intensified among researchers and managers. Increased understanding has been reached regarding what business models contain and how they can be understood in relation to internal and external activities. By combining components of business model theory with the literature on product and industry architecture, this study provides new perspectives on the challenges of replacing one business model with another. Based on four case studies of companies implementing a major regulatory change within the financial services industry, the implications of business model change are identified and analysed. The study's contributions derive from the benefits of combining business model theory with literature in the field of product and industry architecture. In this combination, business model components are identified and discussed to generate specific insights for managers regarding how to handle shifts in business models. Three areas (products, processes, and customers) are especially important; some of the effects in these areas are distributed separately (either internally or externally to the firm), but others relate to both internal and external dimensions and represent a dual or interfaced perspective.

RESEARCHER ROLE AND METHODOLOGY

The following paper is the result of epistemological and ontological reflections over the period of my Ph.D. research. It contains detailed discussion of managing the gap between academic rigor and practical relevance. Some of these reflections are integrated in chapter 3 of the thesis.

"ENGAGED SCHOLARSHIP AS A 'DUAL MODE PUBLICATION BROKER': USING THE SAME DATA FOR DIFFERENT STORIES," ACADEMY OF MANAGEMENT, BOSTON, 2012

The need to improve the flow of knowledge production between academic scholars and business practitioners in organizational science and business studies is well established. Academic scholars are pressed for increased rigor and tendencies of fragmentation, and the business practitioners are finding complexity and time constraints to be accumulating and hence are looking for relevant solutions to current problems. This situation has been termed the "rigor versus relevance" gap. Several approaches have been suggested to bridge this gap, one of which is the engaged scholarship model (Van de Ven, 2007). This paper highlights one specific perspective that has not been thoroughly addressed in research on the relationship between business practice and academic scholarship: the focus on publication activities with the individual as a unit of analysis. How can publication for both academic and business channels improve the practice of engaged scholarship? An auto-ethnographic methodology is used to describe the benefits and pitfalls experienced by the author when attempting to publish in both academic and business channels. The story describes a journey from an executive business career, via a practitioner research programme, into becoming an engaged scholar with a dual role as a doctoral candidate and a business executive. The conclusion is that a strategy of becoming a "dual mode publication broker" provides value. Characteristics of such an individual will be illustrated and ideas for further research will be discussed.