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The effects of technological and digital development on the insurance industry

- A multiple case study of the Swedish insurance industry

by

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Abstract

In recent years, the insurance industry has undergone a transformation where new technologies and digitalization has impacted the competitive structure of the industry and the value chain. The competitive structure in its turn may affect the incentives to innovate. This thesis attempts to examine how technological development and digitalization has affected different parts of the value chain in the Swedish insurance industry in the last twenty years. Further, the study is an attempt to examine the relationship between competition and innovation in the Swedish insurance industry in the last two decades. To accomplish the objectives of the thesis, a deductive approach with an exploratory design of qualitative nature was used, aided by a multiple case study. The data was collected from semi structured interviews and analyzed using coding. The findings of the study suggest that new technologies and digitalization have greatly impacted the competitive structure of the insurance industry due to new players entering the market by exploiting technologies and digitalization, and niche players entering different areas of the value chain. The digitalization and technological development have further impacted the value chain due to increased customer demands and opportunities for new technological and digital solutions. Products and product offerings, interaction with customers and customer behavior, and automation of processes along the value chain are impacted in various ways by new technologies and digitalization. It is also indicated that the increased competition in its turn also has affected the incentives to innovate. The results imply that the insurance industry has had a U-shaped relationship between innovation and competition over the last twenty years.

Keywords: Digitalization, technological development, insurance industry, value chain, innovation, competition, market structure

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1 Introduction

Innovation and development of new products within firms has long been recognized as a key factor in terms of improvement in economic welfare. The understanding of innovation and the ability to utilize benefits deriving from it is of great importance when it comes to economic prosperity and winning market shares (VINNOVA, 2014). Innovation is commonly defined as a complex, path-dependent process where a variety of heterogeneous agents interact in order to learn and react creatively to make a profit from exploiting an invention and bringing it to the market, or using it in a line of production (Schumpeter, 1942). Thus, innovation changes the conditions of economic activity and at the same time, it is the result of a response to changes in the economic conditions (Taalbi, 2014). The market in its turn is usually defined as an industry, where the borders are commonly defined in accordance with an industry classification (Nightingale, 1978).

New innovations can create market disruptions and lead to shifts in the competitive structure of a market (Schumpeter, 1939). According to Schumpeter (1939), competition is the process where firms strive to survive under an evolving set of rules that result in winners and losers on the market where the firms operate. One of the main instruments that allows firms to create an advantage in relation to their competitors is the introduction of informational asymmetries that often is a result from technological innovation (Tavares de Araujo Jr., 1999)

In the last decade, technological innovations like artificial intelligence¹, robotic process automation (RPA)² and “big data”³ have changed the playing field for many industries. Since digitalization of the society has brought new expectations and a higher demand for innovative solutions on the market, firms are now faced with higher customer demands. At the same time, new technological and digital solutions enable completely new cost structures, and allow new players to enter the market by enhancing existing products or by offering new product solutions (Insurance trends, 2019). This puts pressure on firms and their ability to compete on the market, and can lead to transformations of the entire value chain (Stoekli, Dremel and Uebernickel, 2018). Consequently, the competitive conditions and the incentives for innovative activities change (Insurance trends, 2019). New innovative solutions and technologies have the ability to revolutionize the economic structure from the inside as the old technological solutions are replaced with new ones and thus the existing competitive structure of an industry can take a

¹ Artificial intelligence has two meanings. It may refer to the intelligence of a machine, or the research conducted to get a computer or computer system to exhibit intelligent behavior. The goal is for the computer system to have an intelligence that mimics the brain's ability to draw conclusions, solve problems and obtain new knowledge (Nationalencyklopedin, n.d.).

² Robotic Process Automation (RPA) is the use of an artificial intelligence and machine learning software that has the capability to process high volumes of data and perform repetitive manual tasks that would otherwise be performed by humans. RPA technology consists of software robots that can mimic and perform human tasks such as logging into applications, reading and inserting data (Raju & Koch, 2019).

³ Big data consists of large amounts of digitally stored information that cannot be processed using standard database methods (Nationalencyklopedin, n.d.).

drastic turn (Schumpeter, 1934). One example of an industry that has recently been undergoing a technological and digital transformation is the Swedish insurance industry.

1.1 Background

The insurance industry has historically been immobile and has had a low rate of development. The industry is lagging in terms of digital development compared to other sectors such as the banking sector, and it is not until recent years that the industry has begun to explore different digital and technological opportunities and new innovative solutions. Today, many of the large and established insurance companies are digital in their interfaces, but use outdated and complicated IT systems, which can hamper opportunities for development. At the same time, several start-ups, whose business models are based on digitalization and new innovative solutions have started to emerge on the market (World InsurTech Report, 2018).

The Swedish insurance market has been an inflexible industry where organizational structures are traditional and historically bound, and where a great focus has been directed to individual data and specialized services which has resulted in less focus on digital solutions and technological innovation. Moreover, the actors on the market have been few and the incentives for innovation activities have been relatively low. It is not until recent years that the insurance industry has started to face dramatic change due to technological and digital shifts and increased competition on the market (World InsurTech Report, 2018). These changes have required firms to move from the historically traditional structure of the industry towards a more unknown ground (PWC, 2019).

As financial services handle intangible products, technological innovation can work as an opportunity to decrease transaction costs and expedite the delivery of services and if utilized correctly, it can lead to competitive advantages. However, the recent dispersion of internet connections, home computing, mobile devices, and the development of applications has resulted in the possibility of lowering the barrier for market entry, leading to increased competition in the financial industry. The insurance sector is not an exception to this, with technological development creating possibilities for new methods of service provision as well as greater opportunities for data collection that can lead to better risk identification and mitigation measures. These new types of methods are often referred to as “insurtech”, which is a term used to describe the new technologies with the potential to bring innovation to the insurance sector and impact the regulatory practices of insurance markets (OECD, 2017). Development in technology has caused and will continue to cause dramatic changes in how consumers perceive and interact with the insurance firms as well as the role that insurance plays in the everyday lives of consumers. Consumer needs are changing as digital products and consumer options are becoming increasingly important. The first steps towards this direction can already be seen in the industry with many insurance firms adapting different features of insurtech in different parts of the value chain, and

many new technologically advanced actors emerging on the market resulting in a changed competitive structure (OECD, 2017).

Many other service sectors have gone through similar technological transitions in the last decade. For instance, the banking industry has faced tremendous changes in technology and customer needs in the past years causing a digital disruption in banks business models, and driving them to innovate in different areas of the value chain. Profits have been shifted towards those financial organizations that successfully utilize the opportunities of digital technologies to create new values and services for consumers who want the bank to be accessible at all places and times. Successful banking strategies are now based on the understanding of how digital business transformation can create new value and the market changes created by fintech⁴ innovators. Thus, investment in innovation directed towards digital business is of great importance. Although the banking sector is in many ways similar to the insurance industry in terms of market structure and business models, the banking industry has been quicker at adjusting to technological change. As opposed to the insurance industry, the banking sector offers less complex, more standardized products. The standardized nature of the products leads to a more price sensitive customer base and a higher demand for simple distribution. Thus, banks are mainly competing with price and distribution solutions which are both areas within the value chain that are easier to improve through digital solutions than the more complex products of the insurance industry (Tešić and Krstić, 2016).

Although new technologies and digital solutions have already significantly reshaped many other industries, it is believed that this transformation has reached the insurance industry rather late. The insurance sector is still going through a phase where new technological solutions and digitalization is changing the structure of the industry and its value creation, with new products, new ways of interacting with the customers and new business processes (Eling and Lehmann, 2018). Moreover, due to the transformation of the competitive structure and the technological development that the Swedish insurance industry is currently undergoing, the relationship between competition and innovation may be very tangible here compared to other industries (OECD, 2017).

1.2 Aim and objectives

The aim of this thesis is to improve the understanding of how technological development and digitalization affects the insurance industry and the insurance value chain. The thesis further aims to contribute to the understanding of how innovation is affected by competition in an industry that in its turn is largely affected by digitalization and technological development. Although research has already been made on the effects of digitalization on the insurance industry, and the effects of

⁴ Fintech is used to describe new technology that seeks to improve and automate the delivery and use of financial services. Fintech is more related to businesses as opposed to insurtech, which is more often related to service improvements for individuals (Mention, 2019).

competition on innovation, there seems to be a lack of qualitative research on how insurance companies experience the situation in practice. This study aims to contribute with a qualitative viewpoint of the topic and an insight in the experience of insurance companies.

1.3.1 Research questions

- How has technological development and digitalization affected the value chain in practice in the Swedish insurance industry over the last twenty years?
- What has the relationship between competition and the incentives to innovate looked like in the Swedish insurance industry over the last twenty years?

1.4 Delimitations

This study focuses on the changes in the market structure and in the value chain in the Swedish insurance industry as an effect of digital and technological development, and the effects that the transforming market structure has had on the incentives to innovate. In order to study how the industry has transformed over time due to digitalization and technological development and how this has affected the incentives to innovate, the study will be limited to twenty years. In order to increase the comparability of the companies investigated in the study, only insurance companies operating in Sweden are included.

1.5 Outline of the thesis

The first chapter describes the aim and objectives of the study as well as a short background in order to provide context to the research. Following this, chapter two presents a literature review of the main theories relating to the research topic. Chapter three presents the methodology of the thesis with descriptions of research approach and design as well as description of the data and a discussion of validity, reliability and limitations. Chapter four, presents the empirical results obtained from qualitative interviews and discusses and analyses the results from the interviews based on the theoretical review. Lastly, chapter five concludes the findings of the study and re-engages with the research questions as well as the aim and objectives of the thesis. The chapter also includes implications for further research.

2. Theoretical review

The theoretical background starts with Joseph Schumpeter's theory of "creative destruction" (1942), which aims to provide an insight into how the structure of industries are affected and changed by technological development. Following this, a theoretical background of the connection between competition and innovation is presented, describing the "Schumpeterian effect" as well as the "escape-competition effect", with the aim of giving an insight in different theories of the effects of competition on innovation (Schumpeter, 1934; Arrow 1969; Aghion et al., 2001), followed by the theory of the U-shaped relationship between product market competition and innovation (Aghion et al., 2005). Furthermore, literature about how digitalization and technological development affects the structure of the insurance industry will be presented in order to provide a theoretical context that is more specific to the insurance industry. Finally, a theoretical description of how digitalization and technological development affect different parts of the insurance value chain will be presented (Eling and Lehmann, 2018).

2.1 Creative destruction

In order to contribute to an increased understanding of how technological development affects firms and the markets on which they operate, Joseph Schumpeter (1942) developed the theory of creative destruction. Creative destruction refers to the process that occurs when new innovative solutions and technologies revolutionize the economic structure from within, by continuously replacing outdated technological structures with new solutions. The process creates new conditions for competition where the ability to adapt to changes is required when new technological solutions replace obsolete technologies. This type of competition is based on innovation in products and processes and, unlike competitive means such as "price war", means that the entire existing competition scheme and market structure takes a turn (Schumpeter, 1942).

The transformation of the existing structure that takes place during creative destruction pervades the financial performance on both a macroeconomic and microeconomic level. Macroeconomic aspects such as long-term growth, economic fluctuations, structural adjustment and the function of factor markets are affected by the change in the economic structures that arise from creative destruction. At a microeconomic level, the restructuring is characterized by a number of internal decisions on the creation and destruction of production methods (Caballero & Hammour, 1996).

2.2 The relationship between competition and innovation

The relationship between product market competition and innovation is a well-studied area among economists. Schumpeter (1934; 1942) identifies two patterns of innovative activities, also referred to as Mark I and Mark II. The first pattern, Mark I, is characterized by creative destruction and by

changing environments with relatively low entry barriers where new “entrepreneurial firms” mostly account for the development of innovations (Schumpeter, 1934). In this case, the innovative base is expanding as a result of new innovators entering the market, leading to a decrease in the competitive and technological advantages of established firms. The second pattern, Mark II is characterized by stable environments with relatively high entry barriers where large and established firms mostly account for innovations by processes of progressive unification of their technological capabilities along well established technological trajectories (Schumpeter, 1942).

Standard IO theories suggest that innovation declines with competition, due to the fact that increased competition reduces the monopoly rents that reward successful innovators. For instance, Schumpeter (1942) developed a well-known theory that suggests a negative relationship between competition and innovation. Schumpeter (1942) views the capitalistic economy as a dynamic process where firms operate to develop innovation with increased market shares and temporary monopolistic profits as the main incentive behind the innovation activity. A low level of competition encourages innovation and provides the ability to implement dynamic efficiency, which results in larger profits compared to static efficiency that occurs on markets with perfect competition (Schumpeter, 1942). Schumpeter (1942) further argues that firms in monopolistic markets are more likely to innovate as these firms have the capacity to allocate financial resources in a better way than firms in competitive markets. Since monopolistic firms are free to set prices higher than the marginal cost, they are able to invest profits in new innovative solutions in order to improve their manufacturing technologies, products or services. Firms that operate under perfect competition do not have the same profit opportunity and thus they do not have the same possibilities for investing in innovative solutions. Furthermore, firms in monopolistic markets have a higher level of knowledge of the market in which they operate and thus they can make more informed innovative decisions than firms on highly competitive markets. Against this background, Schumpeter (1942) argues that low levels of competition creates higher incentives for innovation than higher levels of competition do. This phenomenon is also referred to as “the Schumpeterian effect”.

Although the Schumpeterian view has been recognized among many economists, some empirical research has shown implications of a positive correlation between innovative output and product market competition. Various studies have attempted to reconcile the Schumpeterian paradigm generating numerous predictions of the relationship between competition and innovation. In contrast to Schumpeter's (1942) view, Arrow (1962) predicts that the relationship between competition and innovation is positive, and argues that high levels of market competition stimulates innovation. Arrow (1962) suggests that when the levels of competition are high, the technological capacities across firms are similar and thus they will innovate in order to gain competitive advantages. This leads to a positive relationship between competition and innovation.

Moreover, Aghion et al. (2001) suggests an extended version of the basic Schumpeterian model and argues that competition can foster innovation as it can reduce a firm's pre-innovation rents more than it reduces the post-innovation rents. This means that innovation may increase the gradual profits of innovation and thus encourage innovation activity. This phenomenon is also referred to as the “escape-competition effect”. This effect will be larger in “neck-and neck-industries' ' where oligopolistic firms confront similar production costs. If firms in a corresponding industry have different unit costs, a firm with lower unit costs are referred to as a technological leader and a firm with higher unit costs are referred to as a technological follower. Aghion et al. (2001), suggest that the competition is particularly intense in the neck-and-neck-industries and that the escape-competition effect is also the strongest in these industries. In less neck-and-neck-industries, on the other hand, more competition can reduce innovation as the followers' reward for catching up with the leaders may fall (Aghion et al. 2001).

2.3 The inverted U-shaped relationship between innovation and product market competition

As a development of previously mentioned views, Aghion et al. (2005) suggest that the relationship between innovation and competition takes the form of an inverted U-shaped curve. According to Aghion et al. (2005) both current technological leaders and followers in any industry can innovate and innovations by leaders and followers all appear step by step. The framework of the U-shaped curve is built on the derivation of four key predictions. The first prediction is that the relationship between innovation and competition is U-shaped, as the escape-competition effect tends to dominate for low levels of competition and the Schumpeterian effect tends to dominate at higher levels of competition. Second, the authors predict that the equilibrium degree of neck-and-neck should decrease with competition because increased competition will increase incentives to innovate comparatively in neck-and-neck industries and thus reduce the expected time interval during which an industry remains neck-and-neck. Third, the escape-competition effect will on average be stronger the higher the average degree of neck-and-neckness of an economy, and therefore the steeper the positive part of the inverted U-curve. Fourth, the escape competition effects should be stronger in industries where the firm's managers are confronted with harder budget constraints. This may result in firms with higher debt to cash flow ratios innovate more for any given level of competition (Aghion et al., 2005).

According to Aghion et al. (2001), incentives to innovate depends greatly on the difference between post-innovation rents and pre-innovation rents of incumbent firms. More competition may reduce a firm's pre-innovation rents more than it reduces its post-innovation rents and thus, competition may stimulate innovation and growth. The increased profit possibilities increases the incentives to innovate and encourages firms to invest in R&D activities resulting in an escape competition effect. However, in sectors where innovation is performed by laggard actors where

the initial profits are already low, competition will mainly affect post-innovation rents resulting in a Schumpeterian effect.

This creates an inverted U-shaped relationship between innovation and competition where at lower levels of competition, the “neck-and-neck” firms have more power to set high prices which means that their profits are relatively high. This means that the reward for innovation is relatively small and thus the incentives for innovation are small. When competition increases, the profits decrease which results in a search for innovative solutions in order to escape competition and take a “leader-position” on the market and the incentives for executing innovation activities increase. In other words, low levels of competition means that firms have little incentives to innovate. As the competition increases, the escape-competition effect increases firms' incentives to innovate in order to become a leader on the market which leads to a positive relationship between competition and innovation. At high levels of competition, the post-innovation profits decrease resulting in a domination of the “Schumpeterian effect”, which leads to a negative relationship between innovation and competition (Aghion et al., 2005).

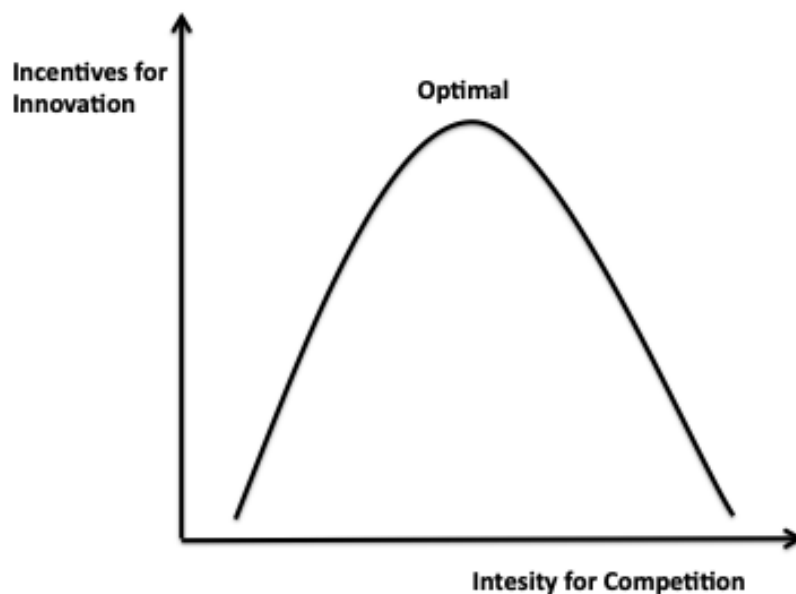


Figure 1: The inverted U-shaped relationship between competition and innovation adapted from Aghion et al. (2005).

2.4 Technological development and digitalization changing the competitive structure of the insurance industry

There is a vast amount of research on innovation in the insurance industry and how technological and digital development is affecting the structure of the industry, as well as how insurance companies handle the structural transformation that comes with it. New technological breakthroughs are creating new methods to control, measure and value risk, as well as improve efficiency, reduce costs, engage with customers and expand their customer base. This creates new opportunities for established insurance companies to improve and create new products and services. At the same time, it creates opportunities for new innovative actors to develop new and enhanced ways of offering insurance and what the insurance experience entails. Disrupters are entering the market by focusing on providing innovative products and services in order to reduce costs and meet unmet customer demands. This forces traditional insurance companies to innovate and use technological and digital solutions in order to respond to these digital disruptors. Customer demands have changed drastically due to a new generation of customers demanding more digital and technology based solutions, and expecting a higher level of convenience, speed and engagement (International finance, 2018). According to research by the institute of international finance (2018), new technologies and digitalization will allow for players with low-cost technology platforms and enhanced business models to target certain areas of the value chain and thereby change the competitive structure of the industry or in parts of the insurance value chain.

The growth of the digitization process of the insurance industry can be considered a result of many different factors. These factors are attributable to technological development on one side, and the change in customer demands on the other side. The technological development comprises size and quality of internet connection and infrastructure and usable applications and opportunities. The change in customers attitudes comprises the entrance of digital generations in the customer base and increasing willingness to use virtual channels and digital solutions in general. This willingness derives from the awareness of new technologies and digital solutions after having tried them for services in industries other than the insurance industry (Cappiello, 2018).

Antonella Cappiello (2018) further argues that technological development and digitalization, as well as the insurers' understanding of these, leads to fundamental changes in the entire ecosystem of insurance, influencing all areas along the value chain and consequently restructuring the competitive landscape and the relationships with customers. New technology and innovations can lower the entrance barriers because new players can enter the market at a much lower cost than 20 years ago. This leads to more new players entering the market, hence the competition increases. According to Cappiello (2018), digital and technological innovation is especially tangible in distribution. The digital development and the new customer standards create new ways of offering and using insurance services. This leads to major changes in the delivery model of insurance companies in order to make their products and services available to the customers. Cappiello

(2018) argues that traditional insurance companies are forced to shift towards processes with increasingly digital interactions in order to maintain the relationships with evolved customers without failing to meet the expectations of customers who require more digital solutions.

2.5 Innovation in different parts of the value chain

Technological and digital innovation impacts the insurance industry and the structure of the market. In a study by Eling and Lehmann (2018), it is discussed in what specific ways the market is affected by innovation and development. New technologies such as big data, robotic process automation and artificial intelligence may affect different areas of the industry in different ways. Eling and Lehmann (2018) present an analysis where they use the insurance value chain as a conceptual framework based on Porter's (1985) general value chain and Rahlf's insurance specific value chain (2007). The value chain distinguishes between primary activities and supporting activities that a firm is dependent on in order to deliver a product or a service. Primary activities in the insurance value chain include marketing, product development, sales underwriting, contract, administration and customer service, claim management and asset and risk management. Supporting activities include general management, IT, human resources, controlling, legal department and public relations. See table 1 for a more detailed description.

Primary activity	Tasks	Supporting activity	Tasks
Marketing	<ul style="list-style-type: none"> ○ Market and customer research: researching ideas for product development ○ Analyzing target groups ○ Development of pricing strategy for product sales ○ Designing of advertisement and communication strategies 	General management	<ul style="list-style-type: none"> ○ Strategic planning and implementation of company goals
Product development	<ul style="list-style-type: none"> ○ Manufacturing the products ○ Product pricing ○ Check legal requirements 	IT	<ul style="list-style-type: none"> ○ IT procurement (hard-/software) and installation ○ IT service ○ IT support ○ IT development ○ Coordination of IT processes
Sales	<ul style="list-style-type: none"> ○ Customer acquisition, consultation ○ Product sale ○ After-sales 	Human resources	<ul style="list-style-type: none"> ○ Planning HR development ○ Job interviews ○ Job market advertisement ○ Job training

Underwriting	<ul style="list-style-type: none"> ○ Application handling ○ Risk assessment ○ Assessment of the final contract details, if necessary ask for more information 	Controlling	<ul style="list-style-type: none"> ○ Data capture and analysis ○ Reporting ○ Business-KPI measurement
Contract administration and customer service	<ul style="list-style-type: none"> ○ Change of contract data ○ Answering customer requests regarding the contract or other purposes 	Legal department	<ul style="list-style-type: none"> ○ Dealing with legal effects
Claims management	<ul style="list-style-type: none"> ○ Investigation of fraud ○ Claim settlement 	Public relations	<ul style="list-style-type: none"> ○ Press/investor management
Asset and risk management	<ul style="list-style-type: none"> ○ Asset allocation ○ Asset liability management 		

Table 1: Primary and supporting activities of the insurance value chain developed from Eling and Lehmann (2018).

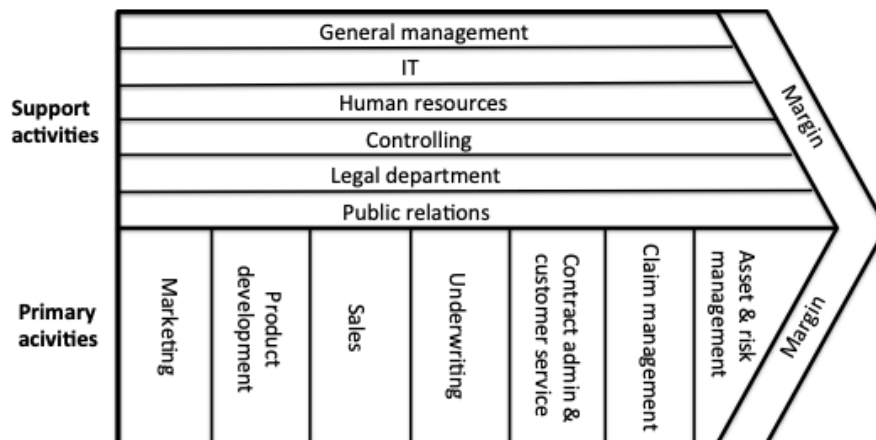


Figure 2: The insurance value chain based on the general value chain by Porter (1985), and the insurance value chain by Rahlf (2007).

Eling and Lehmann (2018) argues that new technological and digital innovations impact the insurance value chain in several different manners, and categorizes the different aspects of innovations impact into three general groups:

- (1) First, it is argued that digitalization and technological development cause *changes of existing products and creates possibilities for new product offerings*. New economic environments such as the sharing economy, where items are consumed by lending them for a short period of time, has created opportunities for an on-demand insurance market where premiums are paid by customers only for the usage period. Technological development also allows insurers to underwrite risk that traditionally could not have been insured. Moreover, programs that can automatically affect claim payments through stored pre-defined conditions (smart contracts) will further impact the product offering. This will for example have large effects on the product development, underwriting, risk management, asset management and claims management in the value chain (Eling and Lehmann, 2018).
- (2) Second, new technologies *change the ways insurers and customers interact and how insurance companies adapt to the customers behavior*. Where customers traditionally have requested personal assistance in order to acquire information about a product or a service, they now demand to be able to reach most information via digital platforms. Furthermore, it has become increasingly simple to compare insurance products and prices online. For some products, it is possible to make a purchase without any personal assistant at all, and in later stages of the value chain the insurance companies can also offer support claim reporting and assistance through technological solutions such as apps. This may for example affect sales and customer service, as well as claims management in the value chain (Eling and Lehmann, 2018).
- (3) Third, *the technological development and digitalization of every process along the value chain leads to an automatization of the business process and decision making process*. This affects the value chain by for example shifting the processing of contracts, reporting of claims, underwriting, claim settlement and product offering towards more automated methods. In an industry where processing of information is a vital part of the business, new ways of processing data such as the use of big data, will largely influence the industry and the value chain. However, Eling and Lehmann (2018) argue that the use of big data in the value chain raises issues. First, they claim that insurance firms need the tools to analyze the large amounts of data after collecting it as it is usually extremely unstructured. Second, using big data for the collecting process through for example telematics devices⁵, social networks or other digital sources might create legal and ethical issues. Questions such as how long insurers are allowed to store the data and how they use and protect it impacts regulatory aspects (Eling and Lehmann, 2018).

⁵ A telematics device is a technological innovation that is usually used in life and health insurance, as well as in motor insurance. These devices allow for smaller and more precise risk pools which means that insurers can offer cheaper prices to good risks (Eling and Lehmann, 2018).

3. Methodology and data

3.1 Research approach

In order to accomplish the purpose of the study, a deductive approach has been used. This approach was chosen because the study was based on theoretical considerations that allowed for an exploration of the research questions. In order to deduce the research questions, they were subjected to empirical scrutiny by conducting qualitative case study interviews. The qualitative approach allowed for a flexible research with the intention of providing an in depth view of Swedish insurance companies experiences of the industry and how changes in the industry has affected them. The intention was, by doing so, to contribute to the research area where seemingly most studies are quantitative and where corporate experience is not taken into consideration (Bryman and Bell, 2011).

3.2 Research design

In order to investigate the effects of digital and technological development on the insurance industry, and the relationship between innovation and competition in the last twenty years, a multiple case study of qualitative nature was conducted. The multiple case study was used as a research design because it allowed for a comparison between different case companies in order to find similarities and differences in their experiences of how the general structure of the market and value chain has transformed over time, and how this transformed structure has affected the incentives to innovate over time. This makes it possible to get an idea of the views, expectations, working methods and processes that have been unique and general in the industry, which contributes to theoretical reflection (Bryman and Bell, 2011). Furthermore, the qualitative multiple case design was used in order to get an in depth view of the topic, and to be able to determine if the obtained findings were replicable across cases. Thus, the cases were selected with the aim that similar results can be predicted and obtained from each one of them. Moreover, the study design was of exploratory nature as it aims to provide a better understanding of a problem that is not completely well defined (Saunders et al. 2012). As the study is based on the view that there is an external reality to which one must direct attention, and that reality can be understood through the usage of appropriate methods, the strategy of the study is further based on the ideas of empirical realism (Bryman, Bell and Harley, 2019).

3.3 Data collection and method

3.3.1 Data Collection

In order to collect data, interviews were conducted with ten respondents operating in five different insurance companies. Two respondents from each firm were interviewed. The interviews were of a semi-structured nature, which is a well-used method for multiple case studies (Bryman and Bell, 2011). The semi-structured method was adopted for this study as it is a flexible interview method that gives the respondents the opportunity to steer the interview, to a certain extent, in a direction they think is relevant and important. However, there was a clear structure of the interviews and an interview guide (appendices) was prepared before the interviews (Bryman and Bell, 2011).

The same interview guide was used for all interviews but in addition to the questions in the interview guide, follow-up questions were in some cases asked in order to clarify the respondent's answers and encourage the person to develop on what he or she considers to be important information. This allowed for more informative interviews where in-depth information could be obtained. In order to be able to do a structured analysis of the collected data, the interview guide was divided into two parts. The first part concerns the competitive structure of the insurance industry in the last twenty years, and the second part concerns the innovation in the industry in the last twenty years. All interviews were recorded under the respondents consent and transcribed in order to ensure that the information provided by the respondents were accurately captured. In addition, recording the interviews allows the interviewer to dedicate full focus on the respondent's answers so that relevant follow-up questions can be asked, and any contradictions can be questioned (Bryman and Bell, 2011). The interviews were conducted in Swedish and translated to English after they were transcribed. In order to protect the respondents integrity, all of the interviewees were anonymous.

3.3.2 Industry and case companies

The study was limited to the situation in the insurance industry over the last twenty years as technological and digital development has affected the insurance industry greatly during this time frame. This made it possible to get an idea of how the industry has transformed in terms of competitive structure and processes in the value chain due to digitalization and escalating technological development, as well as how the changes in the competitive structure has affected the incentives for innovation during this time period. The development in the insurance industry deriving from new technologies and digitalization has emerged relatively late compared to other financial sectors. This means that a study compassing the last twenty years includes a scope of both great technological and digital influences, and the market situation before the emergence of major technological influence and digitalization. A variety of case companies were chosen for this

study in order to get a reflection of the entire industry and not just a smaller segment of it. Thus, the insurance companies included in the study differ slightly in product range, size and history. The aim was to, by doing so, present a fair representation of the general industry.

The case companies included in the study were numbered from 1 to 5. Insurance company 1 is a smaller firm compared to the other companies and has a product offer that includes occupational group insurance and life insurance on the private market. Company 1 is also relatively young in the industry. Insurance company 2 is a larger firm with a longer history in the industry. Insurance company 2 offers Property and casualty insurance, and life and health insurance on both private and commercial markets. Insurance company 4 is a large firm with a relatively long history in the industry, that offers pension and saving insurance, life insurance, and health insurance on both commercial and private markets. Insurance companies 3 and 5, where the former is relatively young and the latter is older in the industry, are both larger firms that offer property and casualty and health insurance on both the private and commercial markets. In order to get an opportunity to examine the effects of technological and digital development in the industry, and the impacts of competition on innovation, the time frame of the study must comprehend different levels of technological advancement as well as different levels of competition, in the industry and thus all of the case companies included in the study have been established for more than twenty years.

Company	Type of product
Insurance company 1	Occupational group insurance. Life insurance on the private market.
Insurance company 2	Property and casualty insurance, and life and health insurance on both private and commercial markets.
Insurance company 3	Property and casualty and health insurance on both the private and commercial markets.
Insurance company 4	Pension and saving insurance, life insurance, health insurance on both commercial and private markets.
Insurance company 5	Property and casualty, and health insurance on the private and commercial markets.

Table 2: Case companies

3.3.3 Respondents

In order to collect as valid data as possible, the aim was to interview people with senior-level positions within the firms and with good insight in the company's history. People who were able to speak openly and informative about the effects of digitalization and new technologies on the market and value chain, as well as innovation in the industry, were therefore contacted. The aim of the interviews was to provide a view of the changes in the industry through the experiences of the insurance companies, and analyze against the background of existing literature.

Respondents	Insurance company	Date of interview
Respondent 1	Insurance company 1	May 8
Respondent 2	Insurance company 1	May 4
Respondent 3	Insurance company 2	May 5
Respondent 4	Insurance company 2	May 6
Respondent 5	Insurance company 3	April 22
Respondent 6	Insurance company 3	April 23
Respondent 7	Insurance company 4	April 17
Respondent 8	Insurance company 4	April 29
Respondent 9	Insurance company 5	April 28
Respondent 10	Insurance company 5	April 20

Table 3: Respondents

3.4 Data analysis

In order to sort the collected material before analyzing it, the data was categorized in accordance with the structure of the analysis and discussion (Bryman and Bell, 2011). This way, connections between different respondents' answers could easily be detected. The structure of the market and the insurance value chain and how it can be affected by technological and digital development from the perspective of existing literature was identified. Therefore, the data was first categorized into different groups where one concerned the changes in the market structure in general and one concerned the value chain more specifically. The latter was further structured after Eling and

Lehmann's (2018) study of the insurance value chain and categorized into three subgroups; new products and product offerings, interaction with customers and automatization along the value chain. After conducting analysis on these areas, the data was re-coded into two main groups concerning the relationship between competition and innovation; the competitive structure in the last twenty years and innovation in the last twenty years.

3.5 Validity and reliability

3.5.1 Reliability

In order to achieve reliability to the greatest extent possible in a qualitative study, this study was characterized by transparency. However, for the purpose of protecting the respondents integrity, and because it was of little relevance for the study, the names of the respondents were not stated nor were the names of the insurance companies. Only the date of the interviews and some relevant information about the size, product range and age of the companies were disclosed, as well as the questions asked in the interviews. Given that the interviews were of a semi-structured nature, there were limitations to the consistency of the answers across the different respondents. Moreover, it should be emphasized that the study was based on the responses of different individuals with individual opinions and perspectives, which could influence the answers. Therefore, some level of subjectivity is inevitable for this type of study, which should be taken into consideration by the reader (Bryman and Bell, 2011).

3.5.2 Validity

In order to achieve internal validity, respondent validation was deployed. This means that the results achieved by the study were communicated to the respondents in order to obtain feedback of the accuracy of the data collected from the respondents, and it was also an opportunity to correct any misunderstandings or inaccuracies (Bryman and Bell, 2011). As the data for the study was only obtained from five insurance companies, there were limitations to the generalizability of the results. However, in order to achieve as high a level of external validity as possible, it is of great importance to examine insurance companies that differ from one another (Bryman and Bell, 2011). A certain width of the sample was achieved by selecting insurance companies of varying size, age and product range. However, one should be aware that the size of the sample cannot completely represent the industry which can affect the validity. Therefore, it should be stated that the conclusions of this study are not definite and might need further studies.

3.6 Limitations

The limitations of this study is primarily a consequence of time constraints affecting the possibilities to study a larger sample of companies in order to collect more data. The limited sample size restricts the generalizability of the results and therefore, the conclusions drawn from this study might not be general to the industry. Moreover, there are limitations to the credibility of the data as the semi-structured interviews may be characterized by some subjectivity. However, the approaches and methods of the study are adopted to provide as much credibility and transparency as possible.

3.7 Chapter summary

In summary, to accomplish the objectives of the thesis, a deductive approach with an exploratory design of qualitative nature was used, aided by a multiple case study. The data was collected from semi structured interviews and analyzed using coding. Moreover, the validity and reliability could have been affected by the sample size and the inevitable subjectivity resulting from semi structured interviews. However, it is believed that the validity and reliability has been maintained by transparency in the study.

4. Analysis and discussion

In this chapter the results from the interviews with the different insurance companies are presented and analyzed. The chapter begins with a presentation of the five case companies. In order to provide a context for the discussion of how technological and digital development has affected different parts of the value chain in the insurance industry, a description of the general market structure and how it has developed over the years is presented. This is followed by an analysis of how different parts of the insurance value chain has been affected by technological and digital development, structured after the theory by Eling and Lehmann (2018). Following this, the U-shaped relationship by Aghion et. al (2005) will be used in order to analyze how the changed competitive structure, in its turn, has affected the incentives to further innovate in the insurance industry over the last twenty years.

4.1 Presentation of the case companies

Insurance company 1. Insurance company 1 is relatively young compared to the other insurance companies in this study. The company focuses on occupational group insurance and life insurance on the private market. Insurance company 1 is a relatively small insurance group consisting of one controlling company and one affiliate. The company operates nationally.

Insurance company 2. Insurance company 2 is relatively large and is considerably older than insurance company 1. Company 2 offers property and casualty insurance, and life and health insurance on both private and commercial markets. The insurance company operates nationally.

Insurance company 3. Insurance company 3 is a considerably large insurance company both in terms of the amount of customers and employees. The company offers property and casualty on both the private and commercial markets. Insurance company 3 operates mainly nationally.

Insurance company 4. Insurance company 4 is an insurance and banking group that is considered to be one of the largest life insurance companies in Sweden. The company mainly focuses on pension, savings, life, and health insurance on both commercial and private markets. The insurance company operates nationally.

Insurance company 5. Insurance company 5 is one of Sweden's largest non-life insurance companies and provides property and casualty insurance on both private and commercial markets. The insurance company mainly operates nationally.

4.2 Technological development and digitalization changing the structure of the industry

The results show that all of the studied case companies have experienced distinct changes in the competitive situation in the industry over the last two decades. When asked about what the industry looked like twenty years ago, various of the respondents describe an oligopolistic industry where a few large actors split the market shares between them. Since then, the structure of the insurance industry has undergone major changes and all of the respondents imply that the competition in the industry has increased recently. For instance, one respondent from insurance company 3 explains the following:

“Twenty years ago, the insurance industry was a national oligopoly market with a few players who divided the market between themselves...The market has significantly hardened when it comes to competition in recent years in all business areas.”

(Respondent 6, 2020)

Most of the respondents state that the increased competition is a result of the digital transformation that the industry has recently been, and still is, undergoing and the new actors that have entered the market as a result of this transformation. Many new, smaller actors that base their entire business models on digitalization, and who have completely digital platforms, have recently started to emerge on the market. Even though they have not yet been able to pose a real threat to the larger players in the industry, they are taken into consideration by the interviewed insurance companies. A respondent from insurance company 5 explains this in the following manner:

“The competitive situation in the industry has in essence been an oligopoly between large insurance companies in the past, and now new players are starting to emerge on the market such as Hedvig and Lemonade who have completely digital platforms and completely digital business models. I guess they haven't really been able to challenge the big players in the insurance industry yet. The industry has been, and still is, pretty conservative even though it is moving forward faster and faster. I would say that competition has increased, but it is probably during the last two years that it has become very evident that we cannot continue as we have done before. We have to make major changes in how we organize and work and such, because of digitalization and because of new expectations on insurance companies. Many external factors create change.”

(Respondent 9, 2020)

Furthermore, it is clear that although the case companies have experienced increased competition in the industry in general, the competitive situation has varied between different parts of the value chain over the years. This has further impacted the competitive structure and consequently the way insurance companies operate. Generally, the studied insurance companies have experienced higher levels of competition in the area of distribution and customer service where technological opportunities and unmet customer demands have resulted in new, more digitally advanced actors entering these areas. All of the studied companies also imply that niche players have entered

different areas of the value chain at various points of time over the last twenty years which has led to greatly increased competition in certain areas. These actors specialize on very limited market segments or features of a value proposition in order to become very competent in their specific area. Moreover, the fact that they are specialized allow them to avoid overhead costs and costs related to administration and financial risks and thus they often offer specific products at very depressed price levels. In this way they are able to displace other insurance companies in that specific area. One of the respondents from insurance company 2 explains this in the following manner:

“Over the last 5-10 years, niche companies have come in and simply pressured their prices in order to take market shares. Since then, digital actors such as Hedvig have popped up, which have a small number of staff who run the insurance company completely electronically, but it is usually not full-fledged insurance companies. They have specific products like for example car insurance or home insurance. Their products are very adapted to an electronic market.”

(Respondent 4, 2020).

The increased competition in the industry has affected firms in different ways. Many of the respondents state that they have been forced to adapt to the new situation, but the ways in which this has been done, vary between the insurance companies. More traditionally bound companies seem to have more difficulty adapting to new competitive situations quickly because of their organizational systems that are often very deeply rooted and can cause inflexibility within the firm. However, some insurance companies have started a process of transforming in order to get the ability to quickly adapt when it comes to changes in the surrounding environment, which is necessary in order to maintain customers and lower costs on a transforming market in the long run. A respondent from insurance company 5 states the following:

“The biggest effect is that we have had to change as a company. We are a traditional insurance company that has built our products on the fact that there is an actual person at the other end, taking care of the customer. What we have seen is that we are moving forward. Sweden is a fairly unique country because we are very electronic in Sweden compared to the rest of Europe. The customers in Sweden want to be online, they want to do a lot themselves, do everything electronically, but it depends on what type of damage it is of course.”

(Respondent 10, 2020)

Moreover, there seems to be a disparity in how insurance companies adapt to the transformation depending on product range. According to a respondent from insurance company 5, property and casualty insurance, especially in the private market, is less complex than life insurance which facilitates implementation of new technological solutions and digitalization, Non-life insurance products are more standardized in their nature and easy to compare. Life insurance is much more complex and therefore, digitalization and automatization regarding these products requires more resources. This indicates that it has been easier for companies that offer non-life insurance to

implement digital solutions and new technologies than for firms that offer life insurance. A respondent from insurance company 3 explains this in the following manner:

“...Because we are offering non-life insurance, I think we have been able to implement digitalization in our processes a little quicker and easier, especially on the private market, than if we would have if we were to offer life insurance...”

(Respondent 6, 2020)

The case companies generally predict that the future competitive situation will toughen even more and respondents from insurance company 1 and 2 argue that the digital development will continue and new actors who handle this well will continue to enter the market. Furthermore, customers will become increasingly aware of new solutions and thus the customer demand will further put pressure on the companies to develop their value creation. Moreover, various respondents predict that international actors will likely enter the market in the near future, which will further transpose the competitive structure in the industry. A respondent from case company 4 explains that many international insurance actors are currently searching for new markets. Large insurance companies from America and Australia want to enter the European market and usually believe that Sweden is a convenient market to test their concept on. As more international players attempt to expand internationally, the Swedish insurance market will see more international actors starting their operations here, which will further increase the competition in the Swedish insurance industry.

“From what I can see, there are so many international insurance players looking for new markets and for some reason they think that Sweden is a good country to test their concept in, especially the American and Australian insurance companies. They want to enter Europe and then they usually start in Sweden. We will see much more of this in the future because there are many players who need to expand their markets and therefore, we will see more international players starting operations here in Sweden. So competition will be tougher.”

(Respondent 7, 2020)

It is also predicted that in the near future collaborations between giant actors from other industries and big insurance companies will emerge. Various respondents believe that large corporations such as Google or Amazon may be interested in entering the insurance industry by cooperating with big insurance actors. This will further change the structure of the industry and affect the firms operating in it. One respondent from insurance company 3 explains:

“I think the competition will be tougher and tougher. I'm still waiting for cooperation between some of the really big players. For example Amazon, Google, Microsoft. Some of them will team up with some other giant like the Alliance or some other monster on the insurance market. When they start collaborating together, then things will happen in the industry.”

(Respondent 6, 2020)

Furthermore, it is likely that specialization will continue to increase in the industry. As the technological development and digitalization increases, and consequently the product availability increases, the customers loyalty to insurance companies may decrease. This creates further opportunities for new players to enter the market by offering certain parts of the value chain to very low prices or through innovative solutions. Despite this, one must realize that the insurance industry is still an industry with large opportunities for profitability. Though most respondents have experienced an increase in competition in the last twenty years, and predict that it will continue to increase in the future, it is also stated that there are great opportunities for financial profitability in the industry which implies that the competition is still on a level that is low enough for companies to be profitable. This is further proven by the fact that new actors are attempting to enter the market.

4.3 Technological development and digitalization affecting the value chain

The results show that all of the studied insurance companies experience that they are continuously executing innovation activity in some form, and most of the respondents claim that innovation has always been an area of focus, but that the attention given to innovation activity has increased in the last twenty years.

According to Schumpeter's (1942) well known definition, innovation is commonly defined as a complex, path-dependent process where a variety of heterogeneous agents interact in order to learn and react creatively to make a profit from exploiting an invention and bringing it to the market, or using it in a line of production. However, the case companies' definition of innovation is somewhat broader than that. They view innovation and development as a response to new demands that derive from several phenomenon such as changed requirements from customers, new digital and technological opportunities and changes in legislation and regulations.

4.3.1 New products and product offerings

According to Eling and Lehmann (2018) the digitalization and technological development is greatly affecting existing products and creates possibilities for new product offerings. According to the firms, innovation has been especially important during the last twenty years as the industry has experienced large changes. Generally, the companies experience that digitalization and technological development has been essential factors when it comes to innovation in the industry. According to one respondent, digitalization has without a doubt been the most important innovation in the industry in the past twenty years which has led to enormous changes both on the market and within organizations. New technologies and digitalization has created possibilities for enhancing products and changing the product offering. The changing economic environment has

resulted in demands for new types of products where the offering is shifted towards a more digital direction. The results show that the product offering has developed greatly over the last years. Several insurance products are already fully digitalized, which means that the entire process from the purchase of the product, to the payment of indemnification in the event of an injury is fully automated. This often leads to a higher degree of efficiency and improved customer satisfaction due to more efficient processes. One of the respondents from insurance company 5 states the following:

“One should be aware that products that are fully digitalized already exist, where no actual person is involved in the process, from the customer buying the insurance to the payment of the compensation. An example of this is simpler types of claims regarding car and home insurance. For example, if you got simple damage to the car or something.”

(Respondent 9, 2020).

Furthermore, some respondents state that the industry is currently in a transition phase where the product offering may go through drastical additional changes. The economic environment is shifting towards a direction where individuals are to a greater extent lending and using objects for limited periods of time instead of purchasing. This creates a demand for a new type of product offering where customers can purchase insurance that applies only during the usage period and where premiums are paid for this period only. This means that the product development in the insurance value chain may continue to change in the future. A respondent from Insurance company 2 explains the following:

“For example, I was at a conference a couple of years ago and listened to the world's largest boat traffic distributor. They have over 30 percent of the market and of course insure their vessels, but with new technology you can make insurance flexible. They started to look at a product where they could have one type of insurance when the boats were in the harbor and one when they were running. They also looked at different types of insurances for different types of loads and so on. This way, there will be no fixed packages anymore. This is likely to create higher competition where customers demand more variable insurance products. I believe that there will be incredible competition from both other insurance companies and an incredible amount of competition as a result of customers demanding more variable insurance products. There are, for example, insurance companies in Sweden already today that have insurance depending on when you drive and how you drive your car. They insert a telematics device into the car that determines when and how you drive. If you drive calmly, the premium becomes cheaper and vice versa.”

(Respondent 3, 2020)

Twenty years ago, when a few large actors shared the market, the ability to handle all parts, and in particular primary parts, of the value chain in an efficient way was a means of competition. At that

time, many insurance companies offered both property and personal insurance and one of the main competitive tools was to be a full service company that could offer the customers a full range of products and services. However, in recent years companies have become increasingly specialized and many players use specific product solutions as a means of competition. New players often enter the market by focusing on a specific part of the value chain and use all their resources to become a strong competitor in that area. This is allowed by new technological solutions like robotisation and automatization that create new ways of offering insurance as well as handling of administration.

“There are for example some actors who have chosen to focus only on child insurance. This way, they have become specialized in both product development and claims management in that particular area and also have an efficient distribution method where they often have agreements and collaborations with other players. In this way, they can become market leaders in this particular area.”

(Respondent 9, 2020)

4.3.2 Interaction with customers

In Eling and Lehmann’s (2018) theory of the insurance value chain, it is further argued that technological development and digitalization also change the ways insurers and customers interact and how insurance companies adapt to the customers behavior. The results show that changes in customer demands and their requirements of new ways of interacting with insurers is a major part of the overall development in the industry. A respondent from insurance company 2 states that customer demands have changed drastically during the last twenty years, and that the technological and digital development has led to major changes in the ways in which insurers and customers interact and how insurance companies adapt to the customers behavior. Consumers are requiring digital solutions and online service to a much greater extent than previously to the 2000s. Where customers traditionally have requested personal assistance in order to acquire information about a product or a service, they now demand to be able to reach most information via digital platforms. Services such as physical customer consulting, which essentially every insurance company provided twenty years ago, have almost become obsolete apart from few exceptional circumstances. This indicates major changes in for example sales and claims management. This has put pressure on insurance companies to shift their value propositions toward a more digital direction. This has also forced companies to innovate more in parts of the value chain that are related to customer behavior and interaction with customers, such as for example customer service and sales in general as well as claims management. Certain parts of the value chain such as distribution, namely the way in which customers can reach the product, and customer service have especially experienced digital development as customers are requiring new digital solutions for interacting with the insurance companies. One of the respondents from insurance company 2 expresses this in the following manner:

“In fact, most customers make demands. For example, the banking industry has been around for a long time and have recently undergone many changes. No one goes to the bank anymore, no one goes to travel agencies physically anymore, many people order food instead of going to the grocery store. Our entire society and the whole world is changing, and customers demand that the insurance industry changes too. Customers are used to handling things online in other markets and then they want to do so with their insurance as well.”

(Respondent 3, 2020)

Traditionally, innovation and development has been directed towards primary parts of the value chain, as the primary activities lead to more directly tangible effects to the customers. In order to meet the increased competition from new digital start-ups and niche players, the larger insurance companies have been forced to innovate primarily in those parts of the value chain that are close and visible to the customer. However, traditional firms that have deeply rooted systems might also be affected in several other parts of the value chain as developed processes in one part of the value chain can influence other parts. This means that innovation in activities related to for example sales or claims management, that are directly visible to customers, may impact supporting activities as development can influence processes throughout the entire value chain.

4.3.3 Automatization along the value chain

According to Eling and Lehmann (2018), the technological development and digitalization of every process along the value chain leads to an automatization of the business process and decision making process. Some of the respondents claim that the company and the processes throughout the entire organization has changed over the years and that they are developing towards becoming more agile along the insurance value chain. However, traditional insurance companies still struggle with their legacy and have not yet been able to reach a state of total digitalization and development of all processes along the value chain.

The results show that the automatization of the insurance industry does not only cover those parts of the value chain that are visible to the customers, such as distribution and customer service. Digitalization creates both demands from customers and opportunities for insurance companies, to automate all parts of the value chain. The insurance industry has historically been a staff intensive market, where actual individuals have been involved in activities such as signing new contracts, underwriting, customer service, and claims management. The increased demands from customers, and increased competition in the industry requires insurance companies to digitalize in order to automate processes along the entire value chain. Today, it is possible to purchase insurance, or get an injury settled through fully automated processes, without the involvement of staff. This phenomenon is a large and comprehensive process for the entire insurance industry, and

crucial for maintaining competitiveness through efficient market processing, while at the same time increasing cost efficiency. One of the respondents describes this as follows:

“What we are working towards is digitalization and adapting to the development and we have really changed the whole company. We were a traditional insurance company where everything was done manually. Today, a very large part of our products is sold online. We sell more online than we do physically today and we also provide digital services today in essentially all areas. We have actually changed the whole company where we have a part that is manual but we also have a lot that is automated and digitalized. It is a huge change and we are still developing to this day, but it has been a very big change. This transition has been going on for a few years. Innovation has always been present, but it has accelerated recently. It has exploded for the last 4 years, then we have done digitalization before then too but I would say the last 4 years it has really exploded within our company and in the market also from people doing digitization a bit here and there to switching completely and it started in 2016.”

(Respondent 10, 2020)

4.3.4 Regulation and legislation

The findings suggest that changes in legislation and regulations have been an important factor when it comes to changes in the insurance industry, which has not been clearly highlighted by literature. Legislation and regulation has been a considerable part of the changes in the industry over the last twenty years, to the extent where it cannot be overlooked when it comes to development in the industry. Although most of the case companies argue that the attention given to innovation has increased due to digital and technological development transforming the market in recent years, it is also highlighted by some respondents that regulatory factors have affected the focus on innovation and development. Various respondents experience that a great amount of time and effort has been put into developing in order to adapt to new regulations that has been established in the last 10 years. Time and resources that would otherwise have been allocated to innovation in other areas more visible to customers, have instead gone to complying with these new regulations. One respondent from insurance company 1 explains the following:

“...However, what has been in focus for the past 10 years has been to comply with regulations. We have put a lot of time into that. Mainly government and legislation and EU directives. So that much of what was to be done in the development of the market went to regulatory issues.”

(Respondent 2, 2020)

Legal and regulatory changes in the insurance industry have resulted in insurance companies being forced to allocate resources to supporting activities in the value chain such as for example legal department and general management. This resource allocation has been necessary in order to remain on the market, but it is often regarded as a negative process since it requires resources that

could otherwise have been allocated to primary parts of the value chain that are more value-creating for customers. This trend may continue, as further regulation and legislation might be needed in an industry under large development such as the insurance industry. Therefore, it may be necessary for large insurance companies to increase the pace of digitization of all processes, including supporting parts of the value chain like the legal department. This may allow insurance companies to implement new regulations more efficiently in the future, without having to overlook other parts of the value chain. This can result in less boundaries between primary and supporting activities in the value chain in the future as digital and technological innovation in one part of the value chain may affect processes in several other parts.

4.4 The relationship between competition and innovation

The results show implications of a relationship between competition and innovation in the Swedish insurance industry over the last twenty years. The previous section of the analysis indicates that the competitive structure of the market is greatly affected by innovations such as new technological and digital solutions. However, the increased competition deriving from new players utilizing technology and digitalization, in its turn, creates increased incentives for further innovation. The following part of the analysis will address the effects that competition has on the incentives to innovate. Most of the respondents from the studied insurance companies experience that the incentives to innovate has increased as the industry has transformed over the last twenty years. The increased competition that is a result of both new opportunities created by development in technology and digitalization, and new customer demands have resulted in insurance companies being pressured to transform their entire organizations internally as well as what they offer on the market. This has, and will continuously, require a substantial amount of innovation activity. However, the results also imply that high levels of competition, where the profitability is relatively low, can reduce the incentives for innovation.

4.4.1 The escape competition effect

According to Aghion et al. (2001) the “escape-competition effect” means that innovation is fostered by competition as innovation can contribute to a reduction of a firm's pre-innovation rents more than of the post-innovation rents. This will result in an increase in gradual profits and thus innovation activity will be encouraged by increased competition. The results show that all of the studied firms have generally experienced increased competition over the last twenty years. The market has shifted from an oligopolistic structure where a few large actors shared the market, to a more competitive structure. As this shift has occurred, the focus on innovation has increased which implies that the increased competition has had a positive effect on the incentives to innovate.

“Although we are moving quite slowly, we have focused a lot on development and innovation. There are no other units within the company that have such a mandate to move forward as the units that work with the development and innovation. We have had an incredible focus on digitalization lately, but it takes a long time to develop something that is noticed and available on the market.”

(Respondent 1, 2020)

Changed customer demands creates opportunities for new players to use digitalization and technological development in order to enhance existing products or create new product offering, and consequently the competition on the market becomes tougher for established insurance companies. All respondents claim that customer demands are a major reason behind the escalated focus on innovation, which further implies a positive connection between competition and innovation.

Moreover, most of the companies experience that they innovate more in areas where they are strong and less in areas where they are a follower rather than a leader. This could be due to the fact that they want to maintain a competitive advantage in parts of the market where they already have a good position. This further confirms that the escape-competition effect has been present in the industry during the last twenty years. In areas where they do not have a strong position, the cost of advancing through innovation might be too high compared to the profit of it.

4.4.2 Neck and neck-industry

According to Aghion (2001), the escape competition effect will be larger in neck and neck when oligopolistic firms experience similar production costs. Various respondents state that the insurance industry has been an oligopolistic industry and that even though the market has undergone some changes in the competitive structure, there are still great opportunities for profitability in the industry. This means that even though new actors are entering the market, the level of competition is still on a level where it is profitable for companies to operate and innovate on the market. This means that the industry could be viewed as a neck and neck - industry in regards to the last twenty years and thus the escape-competition effect is extra strong here. However, all of the studied companies state that the industry is going through a transformation and that many new actors are currently entering the market and many more actors will enter the market in the future.

The industry is changing towards a structure where many new actors base their entire platform and business model on digitalization. This allows the actors to reduce labor costs, administration costs and unit costs in general. According to Aghion (2001), firms with lower unit costs are referred to as technological leaders while firms with higher unit costs are referred to as technological followers. In less neck-and-neck-industries where there is a clear structure of technological leaders and followers, the escape-competition effect is not as strong. According to the results of this study,

the insurance industry has historically been a neck-and-neck-industry where a few actors have shared the market and operated in a similar manner with similar unit costs. However, the current changes in the industry could mean that the new actors, that due to digital solutions can reduce their unit costs, will become technological leaders and the established firms will become technological followers. This implies that the industry may move towards a less neck-and-neck structure where the escape-competition effect will decrease as the competition may reduce the incentives for innovation when the reward for catching up to the leaders is no longer profitable.

4.4.3 The Schumpeterian effect

The results further show that it is clear that the insurance industry is generally still a greatly profitable industry, which means that the competition is still on a level where it is profitable for insurance companies to innovate in order to become a leader or catch up to leading players on the market. Thus, the insurance companies still have incentives to innovate in order to take market shares and increase their post innovation profits. Although the results show implications of a positive relationship between competition and innovation, it is clear that this has not been the case for all parts of the industry at all times within the last twenty years. The competition has not gradually increased equally in all parts of the value chain and in every market or part of a market over the last two decades. It is shown by the results of the interviews that some areas of the industry have occasionally experienced an extreme increase in competition due to niche players entering a market and offering specialized competence or pressured prices. These actors specialize on very limited market segments or features of a value proposition in order to become very competent in their specific area. Moreover, the fact that they are specialized allow them to avoid overhead costs and costs related to administration and financial risks and thus they often offer specific products at very depressed price levels. This has led to some actors refraining from attempting to compete for market shares by innovating in that specific area because the pre-innovation rents will be larger than the post-innovation rents and thus there are no opportunities for profit. This leads to a decrease in the incentives to innovate. Respondents from insurance company 2 and 4 describe this phenomenon as follows:

“Over the last 5-10 years, niche companies have come in and simply pressured their prices in order to take market shares. Since then, digital actors such as Hedvig have popped up, which have a small number of staff who run the insurance company completely electronically, but it is usually not full-fledged insurance companies. They have specific products like for example car insurance or home insurance. Their products are very adapted to an electronic market.”

(Respondent 4, 2020).

“...In some areas where it is not profitable, we have left when it is not worthwhile to put energy into developing in that area, and in other areas you have to be involved and then have to develop to low profitability when it is perhaps good to be involved and visible. Then we view it as a marketing cost. But in general, it must be profitable for one to develop. For example when fintech

companies offer certain things at low prices, you have set a price that is difficult to raise later. So it is important to think beforehand so that you are not stuck. It is always possible to lower but it is almost never possible to raise a price.”

(Respondent 8, 2020)

All of the interviewed insurance companies predict that the future structure of the market will entail even tougher competition. Furthermore, it is likely that the digital and technological development will result in increased specialization in certain parts of the value chain. This could mean that the insurance industry is moving towards a structure where the profitability will continuously decrease as the competition and specialization increase. This means that the post innovation rents will not exceed the pre innovation rents, which reduces the incentives to innovate. This implies that the industry could be moving towards a structure where the Schumpeterian effect is dominant.

According to the theory about the U-shaped relationship between competition and innovation, low levels of competition results in low incentives to innovate. As the competition increases, the escape-competition effect becomes dominant, and as the competition increases and the post-innovation profits decrease, the Schumpeterian effect is dominant, leading to a negative relationship between innovation and competition. The results obtained from the interviews indicate that the incentives to innovate have increased as the competition has increased, implying that the escape-competition effect has been dominant. In certain parts of the market or value chain, where the competition has temporarily been very high due to for example niche players, some insurance companies have chosen to not innovate in that particular area. This indicates signs of the Schumpeterian effect where the incentives to innovate decreases as a result of increased competition. As there have been signs of both the escape-competition effect and the Schumpeterian effect, there are indications of a U-shaped relationship in the Swedish insurance industry.

4.4 Chapter summary

The results obtained from the interviews implies that the insurance industry has gone through, and is still going through, great structural changes. Digital and technological development has allowed new players to enhance products or create new product offerings, which increases the competitive situation in the industry. Moreover, different parts of the value chain in the insurance industry have been, and are being, greatly affected by digitalization and technological development. New product and product offerings have changed because of new technological opportunities and new customer demands, which affects activities related to product development in the insurance value chain. Moreover, the results imply that the ways insurers and customers interact and how insurance companies adapt to the customers behavior have changed. Customers have been requesting digital solutions in the way in which they interact with insurers to a greater extent in recent years which has had a large impact on for example sales and claims management in the value chain.

Furthermore, the results imply that digital and technological development has allowed for an automatization of all processes along the value chain, and that the insurance companies are striving to become more agile with automated processes that comprise both primary and supporting activities. However, traditional firms are struggling with this due to legacy and deeply rooted organizational processes. Another important finding is that apart from technological and digital development, legislation and regulation has greatly affected insurance companies over the last twenty years and the process of implementing and adapting to these new regulations have required considerable resources that would otherwise have been allocated to development and innovation along the value chain.

Although the results indicate that the competitive structure of the market is greatly affected by innovations such as new technological and digital solutions, it is also argued that innovation is impacted by competition. The increased competition deriving from new players utilizing technology and digitalization, in its turn, creates increased incentives for further innovation. When it comes to the relationship between competition and innovation, there are some implications that the changes in the competitive structure on the market has affected the incentives to innovate. The results indicate that the industry has experienced the escape competition effect over the last twenty years where innovation activity seems to have increased as the competition has increased. The results further indicate some signs of the Schumpeterian effect where innovation in some cases have decreased in certain parts of the market or value chain where the competition has temporarily been very high. This suggests that there has been a U-shaped relationship between competition and innovation in the Swedish insurance industry over the last twenty years.

5. Conclusions

5.1 Research aims and objectives

The aim of this dissertation was to improve the understanding of how technological development and digitalization affects the insurance industry and the insurance value chain in practice. The thesis further aims to contribute to the understanding of how innovation is affected by competition in an industry that in its turn is largely affected by digitalization and technological development. To address the subject of the study, I have examined the view of people working in Swedish insurance companies on the situation in the industry over the last twenty years in the purpose of examining the questions; “how has technological development and digitalization affected the value chain in practice in the Swedish insurance industry over the last twenty years?” and “what has the relationship between competition and the incentives to innovate looked like in the Swedish insurance industry over the last twenty years?”.

The findings suggest that new technologies and digitalization greatly impact the competitive structure of the insurance industry due to new players entering the market by exploiting technologies and digitalization and niche players entering different areas of the value chain. The digitalization and technological development further impacts the value chain due to increased customer demands and opportunities for new technological and digital solutions. Changed customer demands and the changing economic environment puts pressure on companies to develop insurance products and the ways in which the products are offered which affects them by creating new opportunities for product development. The ways in which insurers interact with customers and customer behavior is further affected by new customer demands and opportunities for digital solutions as customers are increasingly requiring digital interaction and service. Furthermore, digitalization enables automatization of processes and puts additional pressure on insurance companies to develop and innovate. Automatization impacts processes along the entire value chain. However traditional insurance companies still have issues with shifting their processing towards a more digital direction due to legacy and deeply rooted organizational systems. When traditional companies make changes in one part of the value chain, it requires development in other areas as the processes along the value chain are concatenated. Thus, changes in primary parts of the value chain could affect supporting activities, resulting in substantial change and requiring an extensive amount of resources for companies with deeply rooted processes. Moreover, the findings suggest that changes in legislation and regulations have been an important factor when it comes to changes in the insurance industry, which has not been clearly highlighted by literature. Legislation and regulation has been a large part of the changes in the industry within the time frame of the study, to the extent where it cannot be overlooked when it comes to development in the industry.

Although the results indicate that the competitive structure of the market is greatly affected by innovations such as new technological and digital solutions, it is also suggested that innovation is

affected by competition. The increased competition deriving from new players utilizing technology and digitalization, in its turn, creates increased incentives for further innovation. In the last twenty years insurance companies have experienced that the incentives to innovate have increased as the competition has increased due to new technologies and digitalization, suggesting that the escape-competition effect has been present in the industry. However, some insurance companies experience that the incentives to innovate have in fact decreased in some parts of the value chain where the competition has temporarily increased drastically due to for example niche players, in which case some insurance companies have decided to not innovate in that particular area. This suggests that the Schumpeterian effect has been present in some cases, which implies that the insurance industry has had a U-shaped relationship between innovation and competition over the last twenty years.

5.4 Future research

The present study was limited to a restricted sample size due to time constraints. For future studies, it may thus be of value to study a larger sample of insurance companies in order to obtain more generalizable results of how the industry is affected by technological and digital development, and the relationship between innovation and competition.

Moreover, it may be interesting to further research how implementation of legislation and regulations might be affected by the transformation that the industry has been undergoing recently. The ability to handle and implement changes in legislation and regulation in their automated processes in an effective manner, could be regarded as a means of competition. Failure to do so may result in companies needing to put considerable amounts of resources into managing these legal changes, and lacking resources for developing in other areas. Therefore, insurance companies' ability to handle legislation and regulation in an environment of immense change, may be an important area of further research.

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Appendices

Interview guide

The competitive situation

- Can you briefly describe which market/markets you as a company mainly operate on and what your main products, services and distribution channels are?
- How have you as a company developed over the last 20 years?
- Is the market/markets you operate on international, national or regional?
- How has the competitive situation in the industry changed over the past 20 years?
- In what ways have you as a company been affected by the changes in the competitive situation?
- Who do you see as the company's main competitors and has this changed over the past 20 years?
- What is the most important means of competition in your value proposition?
- Are there certain parts of the value chain where competition has been tougher as a result of new players establishing themselves over the last 20 years?
- How important is price as a means of competition for you?
- What is your view on the future competitive situation?

Innovation (business development)

- What is included in the term innovation to you?
- According to you, which have been the most important innovations in the industry in the last 20 years?

- According to you, which have been the most important innovations in your firm in the last 20 years?
- How has your focus on innovation changed in the last 20 years?
- In what way has the increased/changed competition affected your focus on innovation in the last 20 years?
- Have you been innovating more in parts of the value proposition where there has been less competition at the moment? Have you consciously been looking for areas of low competition in your strategic development in the last 20 years?
- In the last 20 years, how have you handled innovation - / development work in areas where there is a high level of competition?
- What has your innovation activity looked like in the last 20 years? Has it happened entirely in-house or have you outsourced it, or parts of it?
- How do you plan to meet the future competitive situation in terms of innovation?