Market power relationships among life insurance intermediaries

-The power of giants

Abstract:
The imposed commission ban to Finnish insurance intermediaries has generated some controversy and the intermediary market has experienced consolidation in the few last years. The thesis examines the relationship between market structure and profitability among Finnish life insurance intermediaries and tests for the applicability of two market power hypotheses. The panel data analysis shows that there is support for the Relative Market Power hypothesis while the Structure-Conduct-Performance hypothesis is not applicable for Finnish life insurance intermediaries. The implication of this research is that competition authorities should be concerned with market structure effects when discussing changes to the regulatory environment which surrounds life insurance intermediaries.

Keywords: Market structure, profitability, SCP, RMP, intermediaries.

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1. Introduction

The thesis covers Scandinavian life insurance intermediaries, market structure and market regulation. The study is motivated by the ongoing debate regarding the insurance intermediaries’ role and remuneration customs. Recently, Danish and Finnish authorities restricted life insurance intermediaries from receiving commissions on mediated insurance products. In each case, the motivation behind the commission ban explicitly expressed is to protect the consumer from improper advice and to clarify the role of independent intermediaries. Current legislation in Sweden allows insurance intermediaries to receive commissions for mediated products from insurance providers. However, whether to allow or ban commissions in Sweden is currently a widely discussed topic. The debate is not restricted to Sweden, but is found internationally as well. In January 2011, The Swedish Financial Supervisory Authority stated that the remuneration model surrounding insurance intermediaries creates a conflict of interest and therefore expresses its interest in a commission ban to the Swedish market (FI 2011). The European Commission has indicated that current legislation is being revised and that changes to the insurance mediation directive (IMD) are to expect (European commission 2010). On the other hand, Karel van Hulle at the European commission states that a ban of commissions will result in “nirvana for the insurance companies” since they alone would control most of the insurance product sales, which would not be an improvement for the consumer as is the intention with a commission ban (Pensionsnyheterna 2011).

The background chapter initiates by attending to some of the key dimensions to the current debate regarding life insurance intermediaries in general. Identified effects post the new regulation are then laid out, where clear market trends are identified. One key finding is that both the Danish and Finnish intermediary markets seem to consolidate post the new legislation. Empirical evidence on the relevance to consider market structure on insurance intermediary markets is lacking and market structure and market power relationships follow as a natural research topic. The conviction is that intermediaries play an important role in the life insurance market and that one of the key aspects to consider in the current debate is market structure and competition. Thus, an analysis of market power relationships among life insurance intermediaries is the main focus throughout the paper. Market power relationships are especially interesting to study since market structure affects all the markets stakeholders as well as social performance. This study is an attempt to provide empirical evidence with theoretical support and practical relevance to one of the key aspects of the current debate.
1.1 Background

1.1.1 The role of insurance intermediaries

According to Yavas (1994, p. 407) there are two types of intermediaries that facilitate market transactions; market makers and matchmakers. Market makers act on its own account by buying at bid price and reselling at ask price. Matchmakers however, match sellers and buyers without engaging in any trading themselves. Intermediaries in the life insurance market, which this study centers around, are matchmakers in the sense that they mediate insurance products between insurance companies and consumers.

In insurance markets, independent intermediaries act mainly as matchmakers and provide supplementary services for both policyholders and insurance companies. Brokers in the life insurance market are mainly concerned with writing new business and matching consumers with appropriate insurance products. (Focht, Richter & Schiller 2009, p. 2)

According to Biglaiser (1993, p. 223), an intermediary is usually a specialist who is better than others in the market to differentiate the quality of products. Hence, intermediaries may provide efficiency to the market by providing consultancy services to market participants (Focht, Richter & Schiller 2009, p. 2). Similarly, Regan and Tennyson (1997) show that independent agents are better than exclusive sales agents at assessing risk and servicing consumers in uncertain markets or markets with complex product lines, this argues for the importance of intermediaries. Focht, Richter and Schiller (2009, p. 1) argue that intermediaries play an important role in markets that suffers from significant imperfections. The life insurance and pension market represents a high degree of complexity regarding its products, which leads to high search costs for the consumer (Eckardt 2002, pp. 5-6). Therefore, the average consumer lacks the proper knowledge and is unable to take in all the disclosed information necessary to make correct decisions. This also makes it difficult for direct matching between buyers and sellers in the market. Thus, we can relate the Scandinavian pensions market as being imperfect to some extent. Salesmen of a particular insurance company do not have as broad knowledge of other companies products as an independent party. This can mean that insurance intermediaries increase transparency on the pensions market by acting as information providers, which clearly is beneficial to the market (Eckardt 2002, pp. 5-6). Moreover, it is possible for an intermediary to apply price pressure on various insurance products, in case the insurance intermediary has a large customer base, which is attractive to insurance companies.
1.1.2 Remuneration

A rather well discussed topic within previous research on financial intermediaries is regarding remuneration customs. A common discussion is whether the remuneration model affects the quality of advice given by intermediaries. There are two common remuneration systems for intermediaries; a fee-based system and a commission-based system. Commissions are still the major source of underwriting-related income for independent intermediaries. Most commission payments are related to signing of the contract and conditions mostly on the insurance premium (i.e. premium based commissions). In addition to premium based commissions intermediaries may also receive contingent commissions based on performance criteria, such as profitability of the business placed or the volume of business with that specific insurer. (Focht, Richter & Schiller 2009, p. 2)

1.1.3 Main arguments of the current debate

There are several aspects to the debate regarding the commission reward system to life insurance intermediaries. In many cases, the main arguments tend to center on a balancing act between what is most important; to prevent the consumer from ending up in a relationship with insurance companies where the consumer is exposed, or to maintain the mobility of pension capital and stimulate competition in the market (Pensionsnyheterna 2009). In the case where commissions are used as compensation for acquisition of customers, there may be a conflict of interest between consumers and intermediaries, where the advisor is able to exercise his position of trust in favor for personal gain (Cummins & Doherty 2006, p. 383). The Swedish FSA has expressed its interest in a commission ban. According to the FSA, the current remuneration system is not transparent to consumers and there is no clear relationship between the policyholders’ fees and the services provided by the insurance intermediaries. The current commission model does not reflect the cost for the service provided but more closely reflects the premium size and the premium payment period. Due to these circumstances it becomes more interesting for insurance intermediaries to target high income individuals than low income individuals. A conflict of interest may also occur as a direct cause of the current commission system when a change of insurer is not motivated by the policyholder’s needs but by the intermediary’s economical interest. (FI 2005:2) The Swedish insurance intermediary association (SFM) does not agree and argues that the current commission system is crucial to maintain mobility of pension capital on the Swedish market and that the current system is cheaper to the consumer than a fee-based system over time. Since the insurance intermediaries are heavily exposed to competition and have to disclose their remuneration, the SFM does not see any problems with product-funded remuneration as opposed to the FSA. SFM argues
that the current commission model is beneficial to the consumer who only has to pay for advice he or she finds useful. A further argument laid out by SFM is that the current remuneration model favors a market that does not allow market manipulation through vertical integration. According to SFM, a commission ban will cause many intermediaries to switch from being independent intermediaries to becoming tied agents and cause a barrier for new actors to enter the market, which will lead to market dominance among a few inter-nordic actors. (SFM 2011) SFM’s CEO, Per Andelius states that a commission ban is negative for the markets dynamics. Without product-funded remuneration the independent intermediaries will not be able to reach the consumers and the providers of the insurance products will instead serve the market for small savers. Without variable sales costs, smaller insurance companies will not be able to enter the Swedish market since it’s expensive to establish in-house sales forces. This has direct consequences on competition, product ranges and pricing within the industry. (Pensionsnyheterna 2008)

1.1.4 Regulatory changes in Scandinavia

Recent events involving major insurance companies and insurance brokerage firms have directed attention towards the remuneration systems of independent agents and brokers. Ruquet and Hays (2004), exemplifies one event where collusion between a big American insurance broker, Marsh and McLennan, and several insurance companies took place. According to the complaint against Marsh, the broker took payoffs, which were called placement service agreements and market service agreements, to steer business to insurers and shield them from competition. Partly in response to the above-mentioned incident, regulatory changes have been introduced around the world (Focht, Richter & Schiller 2009, p. 3). Commissions were prohibited on July 1st 2006 on the Danish pensions market with a five-year transitional period (No. 401, 25 April 2007) and on September 1st 2005 on the Finnish market with a three-year transitional period, reaching full force in September 2008 (The Insurance Mediation Act 570/2005 (IMA)).

1.1.5 Market observations in Sweden, Denmark and Finland

When analyzing market trends in Finland, Denmark and Sweden, changes to the market become evident. In Finland, the amount of commissions received for insurance intermediaries decreased rapidly from 2007, suggesting that the commission ban had significant effect even during IMA’s transitional period (Appendix 8.1). The total amount of life insurance premiums mediated in Finland have decreased significantly since the introduction of the commission ban, when excluding the statutory share, about one third of the amount mediated 2008 was mediated in 2009 (Appendix 8.2). Clear evidence is found that the market for insurance intermediaries have been shrinking since the
new regulation. Also the revenue per mediated premium has increased during 2004 to 2009 (Appendix 8.3), suggesting that the brokerage services are becoming more expensive. The finding that perhaps is most interesting is that the Finnish and Danish markets seem to consolidate while the Swedish market has become less consolidated. (Appendix 8.4: 8.8) The largest company in Denmark has increased its market share with 17.8% from 2004 to 2009. The three and five largest companies in Finland have increased their cumulative market share with almost 13% during the same time period. The Swedish market has experienced an opposite trend, where the largest firms’ market shares have decreased. The five largest firms have gone from representing one half of the market to cover about one third of the market. Similar trends can be observed for the largest and the three largest companies, who have lost more than 30% of their market shares during 2004 to 2009. These trends in Finland along with a shrinking intermediary market in Finland may be a concern. To determine if market consolidation may be hazardous, it is important to determine if market power relationships are present.

1.2 Problem discussion

Certain trends regarding the Finnish market’s size, pricing and structure can easily be observed. Market structure is a key determinant to the industry’s characteristics. Several previous studies have proven that market concentration is positively related to profitability (Choi & Weiss 2005, pp. 638-639). The Structure-Conduct-Performance hypothesis (SCP) argues that market structure affects the companies’ conduct, which in turn influences their performance. A high market concentration would in this case imply high profitability. Similarly, the Relative Market Power hypothesis (RMP) argues that consumers differentiate the products of large firms from smaller firms (real or perceived differentiation), this may be due to herd effects or consumers may rely on the market leader’s position as an indication of quality and save search costs (Choi & Weiss 2005, p. 638). The consensus of both SCP and RMP is that market consolidation will benefit the largest actors in the market. Competition is good for any industry and as laid out by Stigler (1964), there is a risk of collusion in consolidated industries. A consolidated industry will most certainly affect the consumers adversely in terms of biased power relationships and pricing. Cummins and Doherty (2006) show that consumers end up paying for insurance intermediaries commissions indirectly. Hence, a higher degree of profitability in the insurance intermediation industry should mean a more expensive product for the consumer.
A clear trend towards market consolidation is observed on the Finnish insurance intermediary market (Appendix 8.8). Market structure is critical to study as it provides information about both pricing and quality of advice, in terms of risk of collusion (Stigler 1964). Further, market consolidation may impair competition on a market where firms are able to exercise market power towards consumers and competitors. A commission ban is often argued of as a consumer protective regulation. This paper analyzes if it may have an adverse impact through its effect on market structure. It may be contributing to inferior terms for the consumer by reducing competition in the industry. Tests of the applicability of SCP and RMP have been carried out on the banking sector and insurance industry (Bajtelsmit & Bouzouita 1998; Choi & Weiss 2005; Heffernan & Fu 2007; Tregenna 2009). However to our knowledge no evidence exists to the insurance intermediary industry. It follows that an appropriate research problem is to validate the SCP and RMP hypothesis on the life insurance intermediation industry by testing if market structure and market share is a determinant to profitability in the life insurance intermediation industry. The obtained results provide empirical support for continued debate regarding the relevance of market structure within the insurance intermediary industry. As exemplified by Tregenna (2009, p. 627), market structure affects all stakeholders to the market. A consolidated banking industry with collusive behavior can lead to higher interest rates charged, which in turn can have significant effects on the real economy. In this case, one can expect depressed investments and depressed growth as a direct cause of collusive behavior. If higher profitability within the banking industry is mainly deriving from high levels of market concentration, the profits can be seen as a drain on the real economy. A similar reasoning can be applied to the life insurance intermediary market where market consolidation may foster collusion, and where the consumers and small market players ultimately will have to pay the price in terms of higher prices, search costs and poorer quality of advice given.

1.3. Research question

This study is an attempt to provide empirical evidence with theoretical support and practical relevance to one of the key aspects of the current debate. To determine whether it is relevant to consider effects to market structure when discussing changes to the regulatory environment surrounding Finnish life insurance intermediaries, this study intends to examine the relationship between market structure and profitability. With market power relationships present, firms can exercise market power towards consumers and competitors, which clearly is not beneficial to any industry. A panel data analysis is conducted in order to answer the study’s research question; are market power relationships present on the Finnish life insurance intermediary market? With the
panel data analysis including cross-sectional and time-series data, this study concludes if there is any significant support for the SCP and RMP hypotheses on the Finnish insurance intermediary market. Obtained results from the study can later be used as a foundation for a continued discussion about the future of the regulatory environment surrounding insurance intermediaries.

1.4 Hypotheses

Hypothesis testing is carried out to be able to conclude statistical significance of the obtained results from the panel data analysis.

H0₁: There is no significant support for SCP on the Finnish insurance intermediation market.
H1₁: There is significant support for SCP on the Finnish insurance intermediation market.

H0₂: There is no significant support for RMP on the Finnish insurance intermediation market.
H1₂: There is significant support for RMP on the Finnish insurance intermediation market.

1.5 Aim

The issues surrounding a commission ban to life insurance intermediaries are rather complex. There are many dimensions in the debate that need to be taken into consideration. This study focuses on the relevance of considering market structure and provides empirical evidence to support arguments laid out. Currently, to our knowledge no previous studies on market power relationships among Finnish life insurance intermediaries exist. Therefore, this study examines if there is any support for the SCP and RMP hypotheses on the Finnish life insurance industry. The study aims to provide empirical evidence to the relationship between market structure and profitability within the Finnish insurance intermediation industry. Furthermore, the study will stake out whether it is relevant in a political context, to consider effects on market structure and competition. The results show whether firms are able to exercise market power towards consumers and whether there is any indication of collusive behavior within the industry. The findings are important to consumers, insurance intermediaries, insurance companies and regulators.

1.6 Limitations

The study focuses on Finnish intermediaries that mediate pension and life insurance solutions and do not include firms that mainly mediate non-life insurance products. Any conclusions that can be drawn from this study are limited to apply for life insurance intermediaries rather than insurance intermediaries in general.
Efficiency measures are not included in the regression due to the complexity of efficiency models and to the lack of detailed financial reporting on the sample firms. It is not possible to conclude whether any relationships between firms’ market shares and profitability can be explained by economies of scale and efficiency or collusive behavior among firms. The study is therefore limited to solely determine whether there exist any relationship between market share and profitability.

2. Literature review

2.1 Introduction

The current ongoing discussion regarding insurance intermediaries has generated some controversy. In Finland, changes to the regulatory environment seem to have caused market consolidation and it appears interesting to study if competition may be threatened within the industry during these circumstances. The thesis examines market power relationships among Finnish life insurance intermediaries and tests for the applicability of two market power hypotheses. The aim is to conclude whether any market power relationships exist among Finnish life insurance intermediaries and determine whether it is necessary to consider effects on market structure and competition when discussing regulatory changes among life insurance intermediaries.

Relevant previous literature on the insurance industry covers insurance intermediaries, competition, market regulation, agency theory and theories of market structure and profitability. A review of the most central themes, ideas and arguments follow in this section. The literature review is divided into three subsections; previous literature, theoretical framework and conclusion literature review. Previous literature covers some of the previous research within the field of interest regarding this study, with the purpose of identifying a knowledge gap and a possible research subject. The theoretical framework section presents literature that provides a theoretical framework that can be applied to analyze the study’s empirics. Finally, the conclusion section summarizes previous research and identifies a knowledge gap within previous research that creates a foundation for the study’s research problem. The conclusion section develops into what theoretical and practical contribution the study aims to produce.
2.2 Previous literature

2.2.1 The role of insurance intermediaries
Cummins and Doherty (2006) describe the role of insurance intermediaries in the property causality insurance market, their impact, the role of commissions and its meaning to the market and to consumers. An insurance intermediary’s main task is to break down the complexity among different insurance arrangements and to communicate the information to consumers, who should have the product that suit them best, based on what products are available. Within this part of the insurance market it is relatively easy for new entrants to enter the market as a small player, but to establish themselves as one of the major players is much more difficult. This is due to the fact that large actors are often active in several geographical areas. The way in which players compete with each other is primarily by offering high quality advice rather than to reduce the royalties demanded from the insurance companies. The authors believe that a higher concentration of actors in the local market does not necessarily mean less competition, as the big players simultaneously compete in the global market place. Results from the study show that costs to insurance companies from commissions paid out to intermediaries end up with the consumer in the form of higher fees. However, the author stresses that this need not be negative for the consumer who may ultimately receive a well fitted insurance product.

2.2.2 Commission vs. fee-based remuneration model
Gravelle (1994) compares the commission-based remuneration system to the fee-based system and calculates which system leads to the best outcome for the customer with the help of a theoretical framework. Some of the conclusions are that even if a fee system removes the incentive for brokers to recommend the products yielding the highest commission, the fee system does not provide incentives to present good advice to the customer. Furthermore, even if the commission model does create broker services of lower quality compared to a fee-based system, it does not confirm the fee system as more preferable.

2.2.3 In-house sales force and independent agents
There are different distribution channels available for insurance companies; most common are in-house salesmen or independent agents, who act as intermediaries. Barrese, Doerpinghaus and Nelson (1995), examine the issue of higher cost ratios for independent agents compared to exclusive agents. The authors’ present two possibilities for this phenomenon, either the independent agents produce more information and provide higher quality of service to their customers compared to
exclusive agents, or independent agents search for different solutions from which will render them
the highest commissions. The study concludes that independent agents actually produce better
service, but the differences among them decrease when compared to the largest insurance
companies, suggesting that the largest firms spend more money on their own salesmen, resulting in
better service.

Kim, Mayers and Smith (1996) show that the cost associated with an exclusive sales force is quite
extensive which gives larger insurance companies a comparative advantage; also larger firms are
more likely to gain from having their own sales force. The authors also state that exclusive sales
forces result in higher profits in markets with high concentration among intermediaries.

2.2.4 Agency theory

Incentive problems in the relationship between insurers, intermediaries and consumers can be
analyzed by applying the principal-agent theory framework. An agency relationship exists when one
party (principal) hires a second party (agent) to fulfill a particular action. In this case, decision-making
power is delegated down from the principal to the agent. Due to the principal’s lack of knowledge
and/or time constraints, there are often difficulties in ensuring that the agent acts in the best interest
of the principal (Cummins & Doherty 2006, p. 383). The agent is thus allowed to act in his own self-
interest. This phenomenon is called the principal-agent problem and is a type of moral hazard.
Applying this framework to incentive problems within the insurance intermediary industry
complicates the relationship somewhat. Intermediaries can be seen as an agent for consumers but
also for insurance companies. It is in the insurance companies’ interest that insurance intermediaries
recommend and convey their products to consumers, while it is in the policyholder’s interest that the
insurance intermediaries mediate the products most suitable for him/her. Principal-agent theory
deals with the introduction of economic incentive programs to align the principals and the agent’s
interests, these incentive programs are directly applicable to the relationship between insurance
intermediaries and insurance companies. A commission-based remuneration system seems to be
enough to align the insurance companies and the intermediaries’ interests according to economic
theory. However, it is also in the insurance intermediary’s interest to create value to the customer in
order to be able to build a long-term relationship with the customer. The present value of a loyal
customer is much higher than that of a disloyal customer (Bowen & Chen 2001, p. 215). This
argument indicates that there are incentives for intermediaries to act in the consumer’s interests.
There is also empirical evidence that the size of premium-based commissions from insurers in the
property insurance industry is positively related to the insurance company’s financial strength. In the case of pensions, an entity that remunerates intermediaries with high commissions may not only be of interest to the intermediary, but also to the consumer since the insurer's ability to pay out pensions in the future is based on its financial strength (Cummins & Doherty 2006, p. 384).

2.2.5 No evidence of economies of scale on the insurance intermediary market

If mergers and acquisition activities are present among intermediaries, it will lead to less choice for the customer and less possibilities for small and medium sized insurance firms to compete in the market. This results in a decrease in competition on the insurance market (Cummins 1977, p. 541). Cummins shows that there are no significant effects from economies of scale on the insurance intermediary market which means that mergers don’t lead to a more cost efficient firm. Therefore, he advises regulators to prevent mergers and acquisitions and force the intermediaries to adapt to a more cost efficient model. Otherwise there is a risk that insurers’ in-house sales forces will prevail and lead to a less competitive insurance market.

An earlier study by Cummins (1972) shows that concentration and competition are inversely related, Cummins also concludes that markets with high concentration have higher price levels than markets with low concentration. Thus, high market concentration can have large implications for the competitiveness, efficiency and adaptability of an industry.

2.2.6 Market regulation and liberalization

The motives behind regulation of industries differ, regarding the intermediary market there are two main reasons to regulation. First, regulation preserves fairness in the industry; regulation will prevent information asymmetries from creating disadvantages for the consumer. The other aspect regards the stability of the market, large changes in price levels can lead to customer groups who create turmoil which can have negative consequences for the industry (Meier 1991, p. 702).

Market liberalization opens up opportunities for innovation and allows for greater choice to consumers. In liberalized markets, agents are given an increased function as they act as information providers. Liberalization may mean increased competition among intermediaries and increased pressure to provide good advice. (Drabbe 1994)

2.2.7 Structure-Conduct-Performance and Relative Market Power Hypothesis

The Structure-Conduct-Performance hypothesis (SCP) was developed out of neoclassical economics by Joe Bain in industrial organization (1968), although many researchers have added to its basic
outline since then (Weiss 1979). The SCP hypothesis addresses the relationship between market structure and performance. The market structure affects the conduct of organizations, which in turn affects performance (Choi & Weiss 2005, p. 636). The SCP paradigm predicts a positive relationship between profitability and market concentration level (Chortareas, Garza-Garcia & Girardone 2009, p. 5). Stigler (1964) makes an important contribution to the SCP literature by suggesting that effective collusion of firms increases with market concentration, and collusion then determines the firms’ performance (Choi & Weiss 2005, p. 637). A closely related theory to SCP is the Relative Market Power hypothesis (RMP), which argues that only firms with large market shares and well-differentiated products are able to exercise market power and earn supernormal profits (Berger 1995, p. 404). According to RMP only large companies can influence prices and increase profits as opposed to under SCP where higher generic profits would arise from higher market concentration (Tregenna 2009, p. 615).

There are a vast number of previous studies that test for the applicability of SCP and RMP within the banking industry on different geographical markets, the amount of studies covering the insurance industry seem to be fewer. Previous literature, within the insurance industry, has studied the insurers rather than the insurance intermediaries and no evidence of the two market power hypotheses among life insurance intermediaries has been presented.

2.3 Theoretical framework

2.3.1 Empirical evidence of SCP and RMP

Berger (1995) performs 60 different cross-section regression analyses covering different banking sectors in the US. Berger includes tests for the SCP and the RMP hypotheses and two tests for efficiency. To assure homogeneity, the data sample only includes firms that have existed throughout the entire time period. Profitability is measured by return on assets and return on equity; market shares and market concentration are measured on the basis of the banks’ deposits. Since the concentration ratios and the Herfindahl-Hirschman index yielded similar results, the latter is chosen as a measure of concentration. Berger also includes three control variables, one for market growth and two dummy variables for the bank’s state and metropolitan area. In most regressions, the results show a positive statistically significant market share coefficient and a statistically insignificant concentration coefficient. Out of the 60 regressions, the market share coefficient is positive and significant in 29 cases at the 10 percent significance level and significantly negative in three. The market concentration coefficient is negative and significant in 20 of the regressions. Overall, Berger
concludes that there is support for the RMP hypothesis while there is no support for the SCP hypothesis. Berger also concludes that it is with the inclusion of the market share variable that a positive coefficient for concentration is removed. The results suggest that it is only the largest firms within the banking industry that can exercise market power. However, the results from this study should be analyzed with care. By analyzing the data as a pooled sample of cross sectional elements, Berger assumes the relationships to be identical for all firms and over time. Without providing any information about tests that examine if this assumption is realistic, the results may be biased and the study’s validity is lowered.

Bajtelsmit and Bouzouita (1998) study the private passenger automobile insurance industry in the United States with panel data analysis, a significant positive impact of concentration on profitability is found for the studied period. The authors analyze performance at state level to account for local competition and data is obtained from the annual reports of the companies included in the sample. The independent variables include state specific and market specific factors and the Herfindahl concentration index is included as a test for the SCP paradigm. Bajtelsmit and Bouzouita make the assumption that the error term in the equation computed from the pooled cross-section and time-series data set is an independent random and identically distributed variable with mean zero and constant variance. When assuming no correlation between the error term and the variables, a random effects model (error components model) can be applied. White’s test is conducted to account for a possible heteroskedasticity problem and Durbin Watson statistics is applied to account for autocorrelation, the results do not warrant for the use of an alternative empirical technique. The results from the analysis show that there is support for the SCP paradigm in the context of private passenger automobile insurance.

Choi and Weiss (2005) examine the relationship between market structure and profitability in the property-liability insurance market using hypotheses testing for three market power approaches; SCP, RMP and Efficient Structure (ES). The SCP relationships are hypothesized to be simultaneous cause and effect relationships between market structure, firm conduct and firm performance. Therefore a simultaneous equation bias may exist and augmented Durbin-Wu-Hausman tests are conducted to determine whether endogeneity exists with respect to market share and concentration variables in the equation. For all equations containing no endogenous variables, generalized method of moments (GMM) is used to estimate heteroskedastic equations. For those with at least one endogenous variable, heteroskedastic two-stage least square is used. In line with Bajtelsmit and Bouzouita (1998), Choi and Weiss (2005) use HHI as a measure of concentration on the basis of
Stigler’s (1964) arguments for its superiority over concentration ratios. Profit margin is used to gauge the insurer’s profitability. Control variables in the study include market growth, advertising-intensity, reinsurance utilization, mix of business, distribution system, regulatory system, stock ownership form and group status. Efficiency is estimated econometrically using stochastic frontier analysis, which is an extension of regression analysis that allows estimates of efficiency to be derived explicitly. The data sample population consists of all insurers that report annual statements to the National Association of Insurance Commissioners (NAIC). From this sample any insurer with a negative surplus, assets or premiums, were deleted. Also for the efficiency analysis, all insurers with negative input or output were deleted. Since firms with a minimum market share are not likely to have significant impact on price and supply on the market the authors discarded insurers with a market share less than 0.1% of total premiums. The final sample constitutes of 68% of total premiums written during the period. Cross-sectional and time-series data are pooled in the models, however it is not panel data since they allow insurers to enter and exit different states (markets) over the sample period. ES argues that firms can offer lower prices by being efficient, which enables them to capture larger market shares, leading to increased market concentration. Support is found for ES hypothesis as well as a positive relationship between market concentration and profitability. No support is found for RMP and the authors’ stresses the importance of examining the efficiency of firms when examining market structure.

Heffernan and Fu (2007) study the relationship between performance and market structure in the UK retail-banking sector by using panel data analysis. In this case, little support is found for the efficient structure hypothesis whereas SCP is prevalent among credit products while RMP is dominant among deposit products.

Tregenna (2009) analyses the effects of structure on profitability in the US banking sector during the pre-crisis period. Bank level data is used to conduct panel regressions to test the effects of concentration, market power, bank size and operational efficiency on profitability. Firms with a negative mean profitability and firms without a minimum of six nonconsecutive quarters of full data is excluded from the sample. Since the direction of the causal relationship is a critical question in the study, Tregenna argues for the importance of conducting formal econometric tests. GMM is used to account for possible endogeneity due to the nature of the variables and the issues of causal relationships between concentration and profitability. The equations in the study are estimated using four econometric techniques. Tregenna first uses the ordinary least squares model (OLS) with two-way fixed effects to check for both time and firm specific changes. Operational efficiency is found not
to be a strong determinant of profitability, however robust evidence is found that concentration increases bank profitability. The results prove to hold even when the largest banks are removed from the sample and the author argues that higher profits arising from higher concentration are at the expense of the rest of the economy. The results support the SCP hypothesis of a causal relationship between overall concentration and profitability.

Gonzalez (2009) analyzes how efficiency and political economy variables influence the structure of the bank market in 69 countries. In order to explain the underlying reasons for the existence of a positive relationship between concentration and profitability, Gonzalez (2009) conducts a panel data analysis. He uses a two stage least square random effect model and argues that the fixed effect model is not an option because it is not feasible under the assumption that regulatory and supervision variables are time invariant. The study shows that the explanatory power of efficiency varies with countries different political economy variables. Gonzalez further concludes that antitrust enforcements have different beneficial effects for different countries, depending on the countries level of regulation and supervision.

2.3.2 Herfindahl-Hirschman Index
The Herfindahl-Hirschman Index (HHI) measures the concentration of companies in the market. It has been used since 1982 by the US Department of Justice for analysis of market structure effects from mergers and acquisitions. HHI is calculated by summing the square of each actor’s relative market share to the total market. In HHI, each actor’s market share can both be expressed as a percentage and in decimal form. In the case where it is expressed in decimal form HHI varies from 0 to 1 and in the event where it is expressed as a percentage, the index varies from 0 to 10 000. By squaring the individual weights, HHI adds significant amount of weight to large players compared to smaller actors. According to economic theory, the risk of collusion increases when the market share of leading companies and inequality in market shares increases. HHI is thus a useful measure of market concentration in the case where applied economic theory holds. (Laine 1995, pp. 425-426) A numerical example of HHI in comparison to concentration ratios is provided in appendix (8.16).

2.3.3 HHI - A Concentration Measure Taking the Consumer’s Point of View
Laine (1995) makes the assumption that a company’s market share and the number of customers are proportionate, which means that the HHI reflects the average market share consumers face and that the HHI is taking the consumers perspective when measuring market concentration. If the HHI is calculated based on market shares expressed in percentage, an index value of 3 000 reflects an
average market share of 3000/100 = 30%. Laine further argues that, as the HHI takes the consumers perspective, HHI is very much an appropriate measure when analyzing mergers between companies in order to ensure consumer protection (Laine 1995, pp. 427-428). The assumption that the number of customers is directly related to a company's market share is worth questioning. As a company's market share is a function of several parameters, the validity of Laine’s conclusion that HHI takes the consumers perspective, may be limited.

2.3.4 The relationship between HHI and Price cost margins
Cowling and Waterson (1976) show that the price cost margins are directly related to HHI, where a high index value indicates higher margins (Clarke & Davies 1982). Cowling and Waterson’s (1976) findings are in line with Stigler’s (1964) theory of collusion, where Stigler highlights HHI’s relevance as an explanatory measure of market structure. Cowling and Waterson model the relationship between HHI and price cost margins as a function of price elasticity and number of players within the industry. The model is a simplification of reality and is based on several assumptions, including constant incremental cost for the companies in the industry. The study’s reliability is relatively weak in the sense of the model’s practical applicability, in large part because of the difficulty of isolating the effects from several parameters that can affect pricing in the industry. There were also difficulties in obtaining good reliable data for price elasticities. Variables that according to Porter can affect pricing, such as entry barriers and the bargaining power of suppliers can deepen the analysis. Unfortunately, the study lacks measurable data on these variables, which further restricts the explanatory power of the variables obtained in the model. We should therefore interpret the results with caution, although they can give us an indication of the relationship between competition and power relationships between consumers and businesses.

2.4 Conclusion Literature review
Relevant previous literature on the insurance industry covers theories of market structure, profitability, competition, market regulation and agency theory. Most published previous literature within the insurance intermediary sector seems to cover markets outside Scandinavia. Previous literature show that intermediaries play an important role on insurance markets and that market structure does affect the markets stakeholders. Cowling and Waterson (1976) show that the price cost margins are directly related to HHI and Cummins (1972) shows that concentration and competition are inversely related and concludes that markets with high concentration have higher price levels than markets with low concentration. Cummins and Doherty (2006) deal with
intermediaries’ role within the property causality insurance industry and the relationship between consumers, intermediaries and insurance companies. Results from the study show that costs to insurance companies from commissions paid out to intermediaries end up with the consumer in the form of higher fees. In line with financial pricing theory, Cummins and Doherty (2006) conclude that the pass-through rate on consumers for all types of commissions paid out to insurance intermediaries would be 100%. The majority of research on the market power relationships and the relationship between market structure and profitability seem to be on retail banks and insurance companies. Bajtelsmit and Bouzouita (1998) find support for the SCP paradigm in the context of private passenger automobile insurance. Choi and Weiss (2005) study the property-liability insurance market and find support for SCP whereas no support is found for RMP. Heffernan and Fu (2007) examine the retail-banking sector in the United Kingdom and conclude that SCP is prevalent among credit products while RMP is dominant among deposit products. Tregenna (2009) studies the US banking sector and the results support the SCP hypothesis of a causal relationship between overall concentration and profitability. The results are mixed for the RMP hypothesis, however in most cases the researchers seem to be able to validate the applicability of the SCP hypothesis within the banking industry and the insurance industry. To our knowledge there are no previous studies of market power relationships within the life insurance intermediation industry, especially not on the Scandinavian markets. As predicted by the SCP hypothesis, market structure affects the conduct of firms, however Cummins and Doherty’s (2006) conclusions show that market structure also affects consumers. Thus, it seems important to analyze the relationship between market structure, market shares and profitability within the life insurance industry. This study intends to contribute with the empirical evidence to the SCP and RMP hypotheses that is lacking within previous literature.

In order to make the study feasible, previously developed theoretical frameworks, mathematical measures and statistical methods are applied. As Tregenna (2009) points out, most analyses of the relationship between concentration and profitability seem to use either cross-sectional or time-series methods. There are little analyses using panel data, despite the advantages of these models. In line with Tregenna (2009), an OLS panel data regression analysis is conducted. The OLS regression includes White’s covariance estimator, which reduces overestimated standard errors due to heteroskedasticity. Tregenna (2009) applies a two way fixed effect model, this study uses a firm fixed effect model instead, since there are no time effects within each cross-section that needs to be filtered and the use of time fixed effects causes collinearity issues. In addition to the exogenous variables included in the regression to test for the applicability of the specific hypotheses, other
factors may influence profitability within the industry. In the same manner as previous studies (Bajtelsmit & Bouzouita 1998; Berger 1995; Choi & Weiss 2005), this study includes market growth as a control variable to account for possible external effects on profitability that can be explained by market growth.

3. Method

3.1 Methodology
In Finland the largest insurance intermediaries have gained market shares recently, causing the market to consolidate. With this in mind this study aims to analyze the relationships between market structure and profitability by testing for evidence of the SCP and RMP hypotheses on the Finnish insurance intermediary market. Through panel data analysis based on secondary data compiled from the annual reports of the companies constituting our sample, conclusions can be drawn about the relationship between profitability, market share and market concentration among Finland’s insurance intermediaries.

3.1.1 Ontology
The primary objective is to determine the nature of the phenomenon’s reality (ontology), which affects how knowledge can be acquired (epistemology) and this affects the research process (methodology). This study adopts the view of reality as a contextual field of information (contextual relativism), which acknowledges that human beings are continually processing information, learning and adapting to their environment. (Ryan, Scapens & Theobald 2002, p. 37) This connects to the idea that RMP can be explained by higher perceived professionalism or quality with larger firms or herd behavior among consumers and to SCP through Stigler’s theory of collusion. The study results are interpreted in the context of the Finnish market and market specific factors such as the regulatory environment surrounding the sample firms may affect the results. Contextual relativism is appropriate as it allows for changing relationships among variables and context dependent interpretation. (Ryan, Scapens & Theobald 2002)

3.1.2 Quantitative research approach
The adopted ontological view allows the use of statistical methods to provide explanations regarding phenomena’s in the world. (Ryan, Scapens & Theobald 2002, p. 37) The included variables are based on quantitative observations. It follows, that the most appropriate results are obtained by pursuing
quantitative research, since the purpose of this paper is to provide empirical evidence to possible market power relationships. A brief description of the basis for qualitative research is provided in Appendix (8.18).

3.1.3 Induction & deduction

With a deductive approach the researcher uses existing literature within the area of research as common knowledge. The theories applicability to the market of interest is then tested for by the author to investigate if existing theories are valid (Jacobsen 2002, pp. 34-35, 45). This is opposite to the inductive method where the starting point is the analysis of observations and the results form the base for new theories. Deduction is also called the bottom-up method, where the study’s starting point is in theory and then proceeds to examine how theory fits practice. This study uses a deductive approach and its starting point is in previous literature about the SCP and RMP hypotheses. The hypotheses applicability is then tested for to the Finnish life insurance intermediary market.

3.2 Data collecting methods

The data sample is collected from the Finnish FSA (available April 8th 2011) and the online database Finder (available April 8th 2011). Data concerning mediated premiums is collected from the Finnish FSA, while financial data concerning revenue and EBIT are collected from Finder. The financial information available at the Finder database is collected by Finder from the annual reports of the firms included in the database. To ensure that the data obtained from Finder has not been altered in any way, a random set of data points are picked out and compared to their original data source. Data is collected for the time period 2004-2009, the time period is motivated by the experienced consolidating trend seen on the Finnish intermediary market during this period and is restricted by the availability of adequate earlier data concerning mediated premiums and EBIT. Some data points concerning revenue and EBIT are missing in Finder’s database and to create a complete set of data the missing data points are obtained from the firms’ annual reports. Starting point for the selection criteria of the chosen firms is the Finnish Financial Supervisory Authority’s register of authorized insurance intermediaries. Insurance intermediaries that have permission to mediate life insurance are chosen to be included in the population. The study takes intermediaries that have disappeared from and entered the market during the selected time period of the analysis into account when calculating market shares and HHI. The measures are based on firms that have been active during the respective year. The companies are chosen on the basis of their relative size in order to capture a large share of the entire market. Their relative size is determined by relating the amount of
premiums mediated by the specific firm to the total amount of premiums mediated by life insurance intermediates during 2009. The 18 largest firms constitute our sample and their cumulative mediated premiums represent over 90 percent of the total market for life insurance intermediaries.

3.2.1 Data transformation
The sample firms use different fiscal years; therefore a transformation is necessary to add revenue and profit to comparable calendar years. This is done by dividing the revenue and profit with twelve months and adding the number of months that have elapsed since the new calendar year to previous year’s data. Since two firms have entered the market during the measured time period, data on previous years are missing for those firms, causing an unbalanced data panel. The applied econometrical model takes the unbalanced data sample into account automatically when performing the estimation.

3.2.2 Quality of data
The collected data originates from the firms’ annual reports and any financial information published by the sample firms has been audited by external parties. The accuracy of the data is high since it’s collected from a generally accepted financial database and in some cases directly from the firms’ annual reports. Since data from firms with broken fiscal years are adjusted to fit the calendar year, some market characteristics may not be identified in the regression. However, the transformation is less serious if a non-seasonal earnings pattern is assumed for all sample firms over each year. The sample constitutes of the 18 largest firms in the market but covers both large and small actors. The relative size of the smallest firms included in the data sample do not differ significantly from the smallest firms within the population, therefore a fair view of the market is represented by the data sample.

3.3 Data processing methods

3.3.1 Regression analysis and hypothesis testing
The relationships between market structure and profitability are determined econometrically by conducting a regression analysis. The analysis examines the explanatory power of market concentration and firm specific market shares to operating margins (EBIT margins) among the firms in the sample space. The individual market shares are calculated as the individual firm’s total amount of mediated insurance premiums divided by the total amount of mediated insurance premiums for the market. The market shares are reflected by mediated premiums rather than net sales to ensure a
fair measure of the firms’ mediating business. Market concentration is measured yearly with the Herfindahl-Hirschman index by adding together the squared individual market shares for the sample firms. Market growth is important to account for because it may have a direct effect on the firms’ profitability. Rapid market growth may attract other intermediaries to enter the market, possibly depressing profitability. On the other hand, if significant barriers to entry exist, then growth on the market may lead to increased profitability among the firms. (Choi & Weiss 2005, p. 645) In addition, high growth allows firms to expand with less intense price competition than in a slow growth market. As explained, macroeconomic changes do play an important role for firms’ profitability (Tregenna 2009, p. 620) and the issue of impact from macroeconomic factors will be dealt with, through the inclusion of a control variable for market growth in the estimation model in a similar manner with Berger (1995) and Choi and Weiss (2005). Once the relationships are determined, the set hypotheses are tested for statistically with a student’s t-test. The hypotheses are tested at different significance levels to ensure statistical significance of the found relationships. However, even when statistical relevance can be concluded, there is always a risk of obtaining unfair results. Type I errors occur when the null hypothesis is rejected despite that the hypothesis is true. Type II errors occur when the null hypothesis is not rejected even though it is false (Ryan, Scapens & Theobald 2002, p. 130)

3.3.2 The estimation model

The collected data creates a panel of data, which comprise of both time series and cross-sectional elements, where the cross-sectional elements are the same for the observed time period. (Brooks 2008) The most straightforward way to handle combined time series and cross-sectional data is to perform an ordinary least square (OLS) pooled regression. However, this process has severe limitations, such as the assumption that the relationships are identical for all firms and identical over time. The alternative approach is to estimate separate time series and separate cross-section regressions but this approach may also fail to identify important relationships. Therefore, if the data can be organized as panel data, a panel data analysis should be conducted. By combining cross-sectional and time series data, one can increase the number of degrees of freedom, and increase the power of the test by employing information on the dynamic behavior of a firm sample at the same time. These studies lead to a rich body of data given the wide variability between individuals, coupled with much less variability for a given individual over time (Hausman 1978). Furthermore, the uses of panel data can help to mitigate multicollinearity problems that otherwise are quite common when analyzing individual time series. Panel data is usually divided into two types of estimator approaches, the fixed effect and the random effect approach.
3.3.2.1 The fixed effect model

The fixed effect model is sometimes referred to as the Least square dummy variable model (LSDV). By decomposing $u_{it}$ into $u_{it} = \mu_i + v_{it}$ where $\mu$ is a firm specific term and $v$ which varies over time and firm, the model captures what is left unexplained about $Y_{it}$. (Brooks 2008) $\mu_i$ symbolizes all of the variables that affect $y$ cross-sectional but do not vary over time. It is possible to use a time fixed effect model if we assume that the average $y$ varies over time, but not cross-sectionally. An example is where the regulatory environment changes part way through a sample period. This change may affect $y$, but in the same way for all the firms in the sample. It is also possible to use a firm- and time-fixed effect model, called a two-way model, however with increased complexity.

3.3.2.2 The random effect model

In the same way as the fixed effect, the random effect model assumes different intercepts for each firm that are constant over time. The difference between the models arises in the assumption about how the intercept for each cross-sectional unit is calculated. The random effect model assumes the intercept to come from a common intercept $\alpha$, which is constant for all firms and time and a random variable $\epsilon_i$ that is constant over time but varies cross-sectionally. To be able to use the random effect model, two preconditions do generally have to be fulfilled. First, the error-terms need to display the following characteristics; $\epsilon_i$ must have zero mean, constant variance $\sigma^2$ and be independent of the explanatory variables $X_{it}$ (Brooks 2008, pp. 498-500). Second, the data sample must be drawn randomly from the sample population (Judge, et al. 1982, p. 497).

To ensure that the appropriate estimation model is applied a redundancy test is first conducted to conclude whether the data can be pooled or not. The choice between the fixed effect and random effect estimation models is then established on the basis of how the data sample is chosen and the characteristics of the data sample. Also, a Hausman test is conducted to indicate what model is the most efficient.

3.3.2.3 Redundancy test

To decide if the data can be pooled or not the redundant fixed effect – likelihood test is carried out to check for redundant fixed effects. The null hypothesis, that the cross-section fixed effects are zero, is rejected at great significance, therefore pooling of the data is not appropriate.
A pooled regression assumes that all intercepts are the same for each firm and each time period. This assumption is proven to be inappropriate and therefore, a fixed effect or random effect model has to be applied.

### 3.3.2.4 The choice between fixed effect and random effect estimation model

The general view is that the random effect model gives the most efficient coefficient estimates (Brooks 2008). However, for the random effect model to be the appropriate choice, the two preconditions must be satisfied. The characteristics of the error-terms are tested with the Hausman test. The results from the Hausman test gives a probability of 0.9485 that the null hypothesis cannot be rejected, which means that a random effect model is valid, however a fixed effect model is still valid but less efficient.

**Table 2 - Hausman test**

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>0.359486</td>
<td>3</td>
<td>0.9485</td>
</tr>
</tbody>
</table>

However, the second precondition is violated in this study since a random selection criterion is not used. Therefore, a random effect model cannot be applied and the appropriate choice is to use the fixed effect model. Clarke, et al. (2010) also argue that the fixed effect model is more appropriate if the data set is limited in range and characteristics, which further suggests the use of a fixed effect model. Based on the results from the Hausman test and characteristics of the data sample, the appropriate choice is to use the fixed effect model with cross-sectional fixed effects.

**Equation 1 – Regression equation**

\[ Y_{it} = \alpha_i + \beta MS_{it} + \beta CONC_{it} + \beta Growth_{it} + \varepsilon_{it} \]
Equation 1 shows the fundamental equation used in the fixed effect estimation model. \( Y_{it} \) denotes the dependent variable operating margin of the \( i \)th individual and the \( t \)th time period and the explanatory variables are; market share (\( MS_{it} \)) measured as the specific firm's share of total mediated premiums for the \( i \)th individual and the \( t \)th time period, market concentration (\( CONC_{it} \)) measured as Herfindahl-Hirschman index based on (\( MS_{it} \)), and market growth (\( Growth_{it} \)). \( \epsilon_{it} \) is the error term for the \( i \)th individual and the \( t \)th time period and is assumed to have zero mean and constant variance and to be independently distributed over individual and time. \( \alpha \) is the intercept term for each firm, which is assumed to be constant over time but different for each firm. (Judge, et al. 1982, p. 477)

3.3.2.5 Hypotheses rejection criteria

The study aims to conclude whether there is any support for two market power hypotheses and as shown in the introduction section the set hypotheses are:

\( H_0^1 \): There is no significant support for SCP on the Finnish insurance intermediation market.

\( H_1^1 \): There is significant support for SCP on the Finnish insurance intermediation market.

\( H_0^2 \): There is no significant support for RMP on the Finnish insurance intermediation market.

\( H_1^2 \): There is significant support for RMP on the Finnish insurance intermediation market.

To be able to conclude support for the SCP and RMP hypotheses, a mathematical expression of the set hypotheses is required. The SCP hypothesis predicts a positive relationship between market concentration (HHI) and profitability (EBIT margin) among the sample firms whereas the RMP hypothesis predicts a positive relationship between market share and profitability among the sample firms. Thus, if a significant positive coefficient is found for HHI, \( H_0^1 \) can be rejected since significant support for SCP is found. If a significant positive coefficient is found for market share, \( H_0^2 \) can be rejected since significant support for RMP is found.

Reject \( H_0^1 \) if: \( \beta_{MS} > 0 \) and \( p\text{-value} \leq 0.1 \)

Reject \( H_0^2 \) if: \( \beta_{CONC} > 0 \) and \( p\text{-value} \leq 0.1 \)

3.3.3 Issues that may bias the regression results

3.3.3.1 Multicollinearity

Multicollinearity can occur when the independent variables in the regression have high correlation with each other. Compared to modeling individual time-series, some of the problems with multicollinearity are mitigated by conducting a panel data analysis. (Brooks 2008, p. 498) However,
multicollinearity leads to larger standard errors and lower precision of the regression analysis; therefore a correlation matrix is compiled and represented in the results section. If the correlation is higher than 0.7 or lower than negative 0.7, multicollinearity is a risk.

3.3.3.2 Autocorrelation

When performing a regression analysis it is important that the error terms, or residuals, show a random distribution. If the error term is related to the previous observation the regression estimates of variance and standard deviation will be biased. Autocorrelation can pose a problem to the regression analysis; however, the issue is most critical when analyzing time-series data. By conducting a Durbin-Watson test, the regression error residuals are tested for autocorrelation. (Judge, et al. 1982, p. 289)

3.3.3.3 Heteroskedasticity

A possible heteroskedasticity issue exists when the variables in the regression do not have constant variances. If the value of the explanatory variable increases with the standard error (ε) the regression has got a heteroskedasticity bias. If the regression does display heteroskedasticity, the results include a biased variance estimator and ultimately biased standard errors. (Judge, et al. 1982, p. 420) Biased standard errors yield biased probability values and inferences made with heteroskedasticity present in the regression can be misleading (Brooks 2008, p. 135).

It is possible to use graphical methods to conclude the existence of heteroskedasticity, unfortunately the form or the cause of heteroskedasticity is usually unknown and a plot is likely to reveal nothing. (Brooks 2008, pp. 136-137) Therefore, this study uses White’s heteroskedasticity test to conclude whether the data sample exhibits heteroskedasticity. If heteroskedasticity does exist within the data sample, the use of the White covariance estimator leads to more accurate standard errors and increased significance of the results.

3.3.3.4 Endogeneity

Endogeneity refers to when the regression residuals correlate with the explaining variables. In other words, when an independent variable is not exogenous but also depends on the dependent variable. If endogeneity is ignored the variable coefficients may become over- or underestimated, which can lead to biased regression results and ultimately wrong conclusions being drawn. With an instrument variable model (IV model), such as Generalized method of moments (GMM) or Two stage least square (TSLS), the variables can be tested for endogeneity. IV models include instruments, which are exogenous variables with high correlation with the explanatory variable and that are uncorrelated
with the residuals. The main difficulty with IV models is to find instruments that have the right characteristics. One needs to be sure that the instruments are uncorrelated with the residuals otherwise they become “weak instruments”. If weak instruments are included in the model, the results cannot be used to draw any valid conclusions since a small bias from OLS can become large when including weak instruments. Furthermore, an IV model is always less efficient than an OLS model. Also, the Durbin-Wu-Hausman test for endogeneity may not be entirely conclusive, particularly as it is sensitive to choice of instrumental variables (Tregenna 2009, p. 617). The inclusion of weak instruments is potentially worse than ignoring a possible endogeneity problem (Stock, Wright & Yogo 2002; Hahn & Hausman 2003). Tregenna (2009) uses instruments to conclude that there are no endogenous variables in her study. As Tregenna (2009) argues, the use of Durbin-Wu-Hausman test can be inconclusive and previous researchers have pointed out that there is a risk that the results become even more biased than with the use of OLS. The risk of including weak instruments is high in this study since the characteristics of any possible instrument are not known. Therefore, endogeneity is chosen not to be tested for and there is a risk of a small endogeneity bias in this study. The alternate choice is to follow a similar approach as Tregenna (2009). Though, this is difficult since the validity of the instruments cannot be determined.

3.4 Reliability and validity

The study’s reliability depends on its replicability and its degree of objectiveness in the sense that the results have not been shaped in any way by the author. Validity measures how the results correspond with reality; if the empirical results are true the study’s validity is high. (Ryan, Scapens & Theobald 2002, p. 155)

3.4.1 Reliability

The study is based on public available financial data and the study formulates in detail how the data has been collected. Further, the methodological framework, assumptions and choices are laid out clearly to ensure a high degree of replicability. The purpose is to ensure that the same results can be obtained independently of the researcher and to show that the results have not been shaped by the researchers in this study. Since the data is taken from the firms’ annual reports the view is that the accuracy of the data is high. Due to the fact that companies use different fiscal years the data has been adjusted to reflect the calendar year to allow for comparison. Since this is mentioned in the data processing chapter the study’s reliability is not affected, even if it does affect the study’s validity to some extent.
3.4.2 Internal validity

The internal validity of the study is affected by how well the explanatory variables included in the regression explain the examined variable. A study with high internal validity ensures that the changes in the dependent variable are explained by the independent variable changes and not by other confounding factors. The internal validity determines whether valid conclusions can be drawn from a study. By building in sufficient controls to the research design, the likelihood of drawing valid conclusions is enhanced. (Ryan, Scapens & Theobald 2002, pp. 122-123) This study maximizes the internal validity by applying an appropriate research design that avoids measurement errors and controls for any biases within the data sample. The data is collected from the Finder database and the sample firms’ annual reports. The correctness of the data provided by the Finder database is validated by comparing the provided data to its original data source and this contributes to an increase of the study’s internal validity. Two firms have entered the market during the measured time period (Appendix 8.9). Thus, data points for these firms are missing for prior years resulting in an unbalanced data panel. The statistical program takes unbalanced data into account when performing the regression, despite this; the effects from the missing data points may affect the results. Since the missing data points are accounted for and there are only five missing data points out of 108, the possible bias is small. The HHI is computed on a yearly basis for the entire market and to enable homogenous comparison, the transformation of the firms’ fiscal years into calendar years is necessary, even if it affects the study’s validity adversely. Large differences in relative size among the sample firms may lead to large differences in standard errors. This is because large firms appear to have more constant EBIT margins compared to smaller firms. One possible explanation is that the larger firms are more stable and that the absolute smallest firms may only have a single or a few employees, which makes their EBIT margins subject to manipulation through the amount of salary the business owner, chooses to take out. In this case the smallest firms will have margins that differ significantly from year to year due to changes that may be different from effects from the explanatory variables. This results in higher volatility of the explanatory variables and is a sort of heteroskedasticity problem within the data sample. This issue is treated with the use of the White covariance estimator and the smallest firms in the population are not included in the data sample to avoid obtaining misleading results.

In relation to previous studies (Berger 1995; Choi & Weiss 2005; Tregenna 2009), the collected data sample is small and the regression estimates may be sensitive to outliers. The regression estimates may also be sensitive to the choice of estimation model due to the size and characteristics of the
data sample. Therefore, the importance of applying the correct model is critical to avoid biased results. The study follows Judge, et al. (1982) and Brooks’ (2008) selection criteria for the choice between the random effect model and the fixed effect model. The selection criteria show that the fixed effect model is the appropriate estimation model to use in this study. Thus, the study’s internal validity relies on and the analysis is restricted by the assumptions that need to be made within regression analysis and the fixed effects estimation model.

3.4.3 External validity

External validity relates to the extent to which the results of a study may be generalized to other settings and samples. (Ryan, Scapens & Theobald 2002, p. 123) This study aims to provide empirical evidence to market power relationships among Finnish insurance intermediaries and the study’s external validity does not come as a first priority when the appropriate research design is chosen. However, it is interesting to discuss the results in the context of the Swedish market as a similar regulatory environment to the Finnish may be to expect in Sweden. Previous studies have been on different industries and whether it’s possible to apply the results of this study to other markets or countries is difficult to predict. It seems that similar results have been obtained within the respective industry despite that the studied markets have differed (See Bajtelsmit & Bouzouita 1998 and Choi & Weiss 2005 on the insurance sector and Haffernan & Fu 2007 and Tregenna 2009 on the banking sector). The explanation to this can very well be that the firms have similar conducts and similar roles irrespective of what market they’re present on. If this reasoning is valid, the results do have some external validity as long as the results are applied to the same industry. The Finnish and Swedish markets have many similarities and in fact many actors in these markets are present on both markets. Both the Finnish and Swedish intermediary markets are exposed to competition and are supervised by the FSA of the respective country. Also both the Swedish and Finnish insurance markets are to some degree government controlled even though they are exposed to competition. The role of insurance intermediaries seems to be the same on both markets and previous to the IMA; intermediaries had the same remuneration model in Finland and Sweden. The two markets do differ in terms of size and the Swedish market is the largest market in Scandinavia. Market concentration levels also differ and the concentration level is a critical determinant to the choice of research design, this makes it more difficult to determine the extent to which the results can be generalized to apply for other markets. Any conclusions drawn from the analysis in this study are applicable to Finnish life insurance intermediaries and one should be careful when generalizing the obtained results.
3.4.4 Ethical aspects

The study is based on publicly available financial data that has been disclosed by the sample firms in the study. Furthermore, the data has not been altered to produce any misleading results and the choice of research model has been carried out with care to ensure no misapplication of statistical methods. Therefore, there should be no ethical aspects that need to be considered as in the case where sensitive or harmful information have been disclosed without consent by the examined firms.

3.5 Method criticism

The analysis allows us to identify any linear relationships among the variables included in the regression and fails to identify any other dependencies among the variables. The applied method is appropriate if we assume that the dependencies among the variables can be explained to some extent by a linear relationship, since the aim is to identify whether any market power relationships exists among the Finnish life insurance intermediaries. Regression analyses are quite sensitive to extreme data points, especially when the dataset is relatively small. To ensure robustness of the regression analysis it’s preferable to have a larger dataset than that available to this study. However, the degrees of freedom and the power of this test are increased by combining cross-sectional and time series data into panel data. Panel data leads to a rich body of data given the wide variability between individuals, coupled with much less variability for a given individual over time (Hausman 1978). Using panel data rather than individual time series can also help to mitigate multicollinearity problems that otherwise are quite common among time series. A regression with panel data can also help to remove the impact from omitted variables, that otherwise would generate biased results (Brooks 2008, p. 489).

The purpose of the econometrical model is to explain a process or phenomenon and therefore it is of high priority that the correct explaining variables are included. Since the aim is to determine the relationship between market structure and profitability within the industry, widely accepted measures of market structure and profitability are included in the regression. In line with Bajtelsmit and Bouzouita (1998), Berger (1995) and Choi and Weiss (2005) the study includes HHI as a measure of concentration on the basis of Stigler’s (1964) arguments for its superiority over concentration ratios. By squaring the individual market shares in the calculation of HHI, significant weight is added to the largest actors within the industry. According to previous literature, market power is most likely to be exercised by the market leader. This makes HHI a highly relevant measure of market concentration when analyzing market power relationships. The firms’ relative market shares are
included as well, to be able to measure the impact from increased or decreased market shares on profitability. The relative market shares are calculated as the firm’s relative share of the total amount of mediated premiums. Mediated premiums are a good measure of market share compared to using net sales, which could be misleading since it includes revenue from other sources than mediation. Profitability is measured in a similar manner with Choi and Weiss (2005) who use profit margin to gauge insurers’ profitability, this study includes EBIT margin as a measure of profitability to exclude any deceptive effects and to ensure that the profitability of the main business is measured. To account for external factors, a growth control variable is included in the analysis in the same manner with Berger (1995) and Choi and Weiss (2005). Since changes to the size of the market affects firms, it is necessary to include a control variable that removes the effects that come from these changes. By conducting a series of tests on the data sample, the study identifies and removes any obstacles that interfere with the results. These tests check for any problems arising from heteroskedasticity, multicollinearity and autocorrelation. If these issues are ignored it can result in biased regression estimates. However, these tests are not always flawless and one still needs to analyze the results critically before drawing any conclusions to ensure the study’s validity.

Later studies include efficiency measures when analyzing market power relationships, Choi and Weiss (2005) include both revenue and cost efficiency measures in their analysis of the efficient structure hypothesis. The efficient structure hypothesis suggests that the structure of the market in which firms operate is also determined by efficiency, higher profits are earned by relatively more efficient firms and since concentration is a by-product of efficiency, these profit gains are viewed upon as economic rents rather than monopoly rents. Researchers that support the efficient structure hypothesis criticizes the traditional market power paradigm since efficiency are not taken into consideration. (Choi & Weiss 2005, p. 639) One of the drawbacks of the applied research method in this study’s is the lack of inclusion of the efficiency hypothesis as the validity of the results may be lower.

4. Results

4.1 Empirical results
Table 3 – Regression Analysis SCP and RMP hypotheses

Panel Least Squares Cross-section fixed (dummy variables) with White cross-section covariance estimator
Observations: 102

Dependent Variable: Operating margin

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.390161</td>
<td>0.035149</td>
<td>11.10031</td>
<td>0.0000</td>
</tr>
<tr>
<td>HHI</td>
<td>-1.917080</td>
<td>0.250022</td>
<td>-7.667650</td>
<td>0.0000</td>
</tr>
<tr>
<td>MS</td>
<td>0.414876</td>
<td>0.168718</td>
<td>2.458987</td>
<td>0.0161</td>
</tr>
<tr>
<td>Market growth</td>
<td>0.056440</td>
<td>0.045431</td>
<td>1.242318</td>
<td>0.2177</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.695286</td>
<td>Durbin-Watson stat</td>
<td>2.069151</td>
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</tr>
</tbody>
</table>

Table 3 shows the regression results from the fixed effect model with the White covariance estimator. The concentration measure, Herfindahl Hirschman index, shows an estimated coefficient of -1.917. This shows that an increase in market concentration reduces the generic operational margins for the life insurance intermediaries in the market. This is opposite of what the SCP hypothesis predicts. The large negative t-statistic and the probability value of zero suggest a very high level of significance. Since the results show a negative coefficient for HHI at the highest level of significance, the SCP null hypothesis (H0_1) cannot be rejected. The estimated market share coefficient is 0.4148 and the RMP null hypothesis (H0_2) is rejected at the 5% significance level. Thus, a higher market share increases the operational margin for the specific firm. The control variable for market growth is weakly positive of 0.056 and not significant with a probability value of 21.7%, this suggest that market growth does not have significant explanatory power to the sample firms EBIT margins. The coefficient of determination (R^2) of the regression is 0.695 and measures the models goodness of fit to the observations (Kunst 2009, p. 7).

4.2 Quality check

Prior to analyzing the regression results and drawing any conclusions it is necessary to identify and solve any issues that may bias the results. This section shows the results from tests conducted to account for possible multicollinearity, autocorrelation and heteroskedasticity issues.

Table 4 – Correlation Matrix
Table 4 shows that the correlation is low between the variables in the regression except between market growth and HHI. Correlation between market growth and HHI indicates that there is a risk of multicollinearity issues and the market growth variable is removed from the regression analysis to test for possible multicollinearity issues. The output with market growth excluded from the analysis is shown in Appendix 8.10 and the results show that the effects to the market share and HHI coefficients are minor. The main difference is a slightly lower significance of the market share coefficient, which is still significant at the 5% level. The coefficient of determination is slightly lower at 0.6949 compared to 0.6952 with the market growth variable included. Since there are no significant differences to the regression results when the market growth variable is excluded, multicollinearity poses no issues to the regression estimates.

The output from the Durbin-Watson test shows a DW statistic of 2.069 (Table 3). A Durbin-Watson statistic close to two indicates zero autocorrelation, whereas a DW statistic less than two indicates positive autocorrelation and a statistic above two indicates negative autocorrelation. Since the regression does not show any signs of autocorrelation there is almost no risk of biased results due to autocorrelation.

White’s heteroskedasticity test tests the null hypothesis that no significant heteroskedasticity exists within the data sample. The output from White’s test shows that the null hypothesis cannot be rejected up to the 36.58% significance level. Since the null hypothesis cannot be rejected, the regression should not exhibit heteroskedasticity to an extensive degree. However, since the probability value is relatively low there is a risk that the regression may exhibit heteroskedasticity to some degree. Any bias resulting from heteroskedasticity is to a large extent removed with the inclusion of the White covariance estimator in the model.

Table 5 – White’s Heteroskedasticity Test

Method: Least Squares
5. Analysis

The results indicate that market power relationships do affect profitability among insurance intermediaries. Significant results are obtained for both market power hypotheses where the RMP hypothesis proves to apply for the Finnish life insurance intermediary market. No support for the SCP hypothesis is found on the Finnish life insurance intermediary market. The degree of market consolidation seen so far has not resulted in higher generic profitability, but lower profitability among the sample life insurance intermediaries. The Finnish life insurance intermediary market has shown an increase of HHI from 13.83% in 2004 to 16.75% in 2009, a relative increase of 21.13%. The relative change in market structure appears to be significant to affect the actors on the market, however not in the same direction as predicted by the SCP hypothesis. The results show an opposite relationship between market structure and profitability to what the SCP hypothesis predicts. The results show that a 1% increase in HHI results in a 1.917% decrease of the operational margins among the sample firms. Since there is no evidence of the applicability of SCP to Finnish life insurance intermediaries, it indicates that as long as the market concentration level is kept on a reasonable level, one should not prioritize to consider effects on market concentration per se when discussing new regulation to life insurance intermediaries. According to Stigler (1964), the risk of collusion increases with market concentration, thus, the higher market concentration, the higher the risk of collusion. If one follows Stigler’s (1964) arguments and assumes that the relationship between

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>p-value</th>
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<td>-0.352186</td>
<td>0.7255</td>
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<td>MS^3</td>
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<td>0.890558</td>
<td>0.3754</td>
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<tr>
<td>MS*HHI</td>
<td>-3.058748</td>
<td>2.277499</td>
<td>-1.343029</td>
<td>0.1824</td>
</tr>
<tr>
<td>MS*Market growth</td>
<td>-0.209454</td>
<td>1.233840</td>
<td>-0.169757</td>
<td>0.8656</td>
</tr>
<tr>
<td>HHI^2</td>
<td>2.935014</td>
<td>1.823449</td>
<td>1.609595</td>
<td>0.1108</td>
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<tr>
<td>HHI*Market growth</td>
<td>0.843389</td>
<td>1.946119</td>
<td>0.433370</td>
<td>0.6657</td>
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<tr>
<td>Market growth^2</td>
<td>0.443645</td>
<td>1.968455</td>
<td>0.225377</td>
<td>0.8222</td>
</tr>
<tr>
<td>Obs*R-squared</td>
<td>6.536681</td>
<td>Prob. Chi-Square(6)</td>
<td>0.3658</td>
<td></td>
</tr>
</tbody>
</table>
market structure and risk of collusion is not linear but exponential then the relationship between market concentration and profitability becomes dynamic. Following this reasoning, it is not possible to predict the relationship between market structure and profitability in the case of much larger changes to HHI than those observed in this study. Very high concentration levels could lead to collusion among firms and ultimately to support for SCP. This also questions whether the chosen research design used to test the SCP hypothesis is appropriate. However, the changes to concentration levels experienced among Finnish life insurance so far is not yet large enough for the industry to be considered highly concentrated, but rather slightly fragmented. Accordingly, the observed changes to concentration does not warrant for any other research design than the linear regression estimation models applied in this case. But one should bear in mind that the applied design may be limited when applied to highly concentrated markets with significant concentration level increases.

The regression estimates show that there is support for the RMP hypothesis on the Finnish life insurance intermediary market. Relative market share is a significant explanatory variable to profitability among the life insurance intermediaries. Cummins (1977) concludes that there is no evidence of economies of scale within the insurance intermediary industry, assuming that Cummins conclusions are generalizable to apply for Finnish life insurance intermediaries, the link between increased market share and increased profitability cannot be explained from economies of scale. To conclude whether the determined relationship between market share and profitability can be explained by collusive behavior, efficiency or any other explanatory phenomenon, a deeper analysis of the individual companies included in the sample is called for. Such analysis is beyond the scope of this paper since the aim is solely to conclude whether market power relationships exists and if they may pose a risk on the Finnish life insurance intermediary market. The applicability of the RMP hypothesis for Finnish life insurance intermediaries shows that the largest companies are able to exercise market power towards consumers. If economies of scale are not present among insurance intermediaries there is no incentive to allow for companies to gain unjustified large market shares. Long-run effects from significant increased market shares among the largest firms can be that smaller actors may struggle to compete in the market. The study can conclude that it is important to analyze mergers and acquisitions as well as any event or regulatory change that can result in unfair market shares among certain entities.

The results are consistent with what Berger (1995) concludes on the US banking sector but contradict Tregenna’s (2009) conclusions on the UK banking sector. Results from previous studies within the
insurance industry (Bajtelsmit & Bouzouita 1998; Choi & Weiss 2005) support the SCP hypothesis rather than the RMP hypothesis and are contradictory to the results obtained here. The fact that the results contradict to many previous studies does not question the study’s validity since the banking and insurance industries differ from the insurance intermediary industry. Among many differences between the industries, some of them are; the firms main business and conduct, market structure, competition and regulation. Any results from previous tests of the hypotheses are not generalizable to apply for insurance intermediaries and the results obtained provide an important contribution of the applicability of the SCP and RMP hypotheses. Even if conclusive results with previous literature increase the external validity of the hypotheses as phenomena, previous literature are in this case mainly helpful by providing well developed theoretical frameworks. Following the same reasoning as laid out above, the extent to which this study’s results are generalizable is limited and inferences made are limited to apply for the Finnish life insurance intermediaries. One should be careful when generalizing the conclusions drawn in this study to apply for life insurance intermediaries on other markets as external factors may affect the dependencies among the firms. The study’s transparent approach regarding data collecting, data processing and method allows the study’s reliability to be considered as high.

Regression analyses are sensitive to outliers and the operating margins are depicted graphically to ensure that outliers don’t interfere with the results. The scatter plot (Appendix 8.11) shows that there are no extreme data points. However, three data points with large negative values do stick out from the cluster. If one were to exclude these data points without scaling down the data sample in both ends, the results are highly likely to become biased. Such down scaling of the data sample includes the exclusion of twelve data points, which constitute about 11% of the data sample. Thus, down scaling of the data sample is not appropriate since a reduction of the rather small data sample is likely to yield unfair regression results and decrease the robustness of the results. Therefore, the outlier analysis does not warrant for the exclusion of any data points and it is safe to conclude that the internal validity is not threatened to a significant extent by any extreme data points. A few data points are missing in the data panel and some data points have been adjusted to fit the calendar years. The assumption that the sample firms do not display any seasonal earnings patterns needs to be made and despite that the transformation is not serious and that some data points simply have been lagged approximately three months, the study’s internal validity may be affected adversely. The applied research design is useful to identify the examined relationships and is appropriate for the
study’s aim, but it is limited when it comes to its explanatory capabilities to causal relationships and underlying phenomena.

When reflecting upon the chosen methodology and the ontological assumption made, the view of reality as a concrete process, seems to fit the purpose of this study as well. In transcendental realism, reality subsists within the universal laws that explain how things evolve over time (Ryan, Scapens & Theobald 2002, p. 37) This ontological assumption is often illustrated by the notions of evolution and “survival of the fittest” in biology (Ryan, Scapens & Theobald 2002, p. 37) and relates to the Relative Market Power hypothesis which suggests that the largest actors in the market are able to exercise market power due to their relative size advantage. Transcendental realism (reality as a concrete process) also allows the researcher to use scientific methods. However, this ontological assumption comes with the assumption of general laws to describe how things change and it does not allow for context dependent interpretations such as market specific factors. Thus, this assumption restricts the applicability of the market power hypotheses to be universal and apply for all markets. Empirical evidence to the market power hypotheses contradicts to this reasoning as results differ between industries and markets. Transcendental realism becomes inapplicable to this study since any conclusions drawn, in previous studies and in this one, cannot be viewed upon as universal laws applicable to any industry or market. Therefore, the applied contextual relativism and epistemology along with the carefully chosen statistical method prove to be a well fitted methodology to answer the study’s research question.

6. Conclusions
The imposed commission ban to Finnish insurance intermediaries has generated some controversy and the Finnish intermediary market has experienced consolidation in the last few years. The study tests for the applicability of two market power hypotheses and investigates whether there is a possibility for firms to increase their operating margins due to changes in market concentration levels and individual market shares. As no previous studies of market power relationships have been carried out on insurance intermediaries, the study provides an important contribution to existing literature on the applicability of market power hypothesis within the services sector. The study shows that there is support for RMP among Finnish life insurance intermediaries while it disproves the applicability of SCP. The applicability of the RMP hypothesis shows that the individual firms’ market shares play an important role in determining the profitability of the mediation services. One could expect that the relative sizes and individual brands become more important when the basis for
competition is altered through a new regulatory environment. The results are conclusive with previous discussions about dominance of large inter-nordic players on markets where the commission based remuneration model has been abolished (SFM 2011). The main practical applicability of the obtained research results is that regulators should be concerned with effects on market structure when considering changes to the markets regulatory environment. The role of insurance intermediaries in the insurance market is important and the current consolidation trend in Finland should not be neglected when deciding the future of the ban towards the commission remuneration model. Such changes to markets regulatory environment may be hazardous with market power relationships present. The applicability of RMP to Finnish life insurance intermediaries shows that regulators should make sure that market competition is not altered by allowing a single or a few firms to obtain unfair market shares. The fact that SCP is not prevalent among the intermediaries shows that regulators should not be concerned with the market concentration level per se when it is kept at a reasonable level.

Suggestions for future research are to follow the same methods and conduct the study at a later time with an increased amount of available data points to increase the study’s robustness. Further analysis could also be conducted on other geographical markets to be able to determine whether the results can be generalized to apply for insurance intermediaries in general. As mentioned in the analysis section, a deeper analysis of the explanation to the found RMP relationship is beyond the scope of this paper. This could very well be the subject for future research by employing a different research design, perhaps with the inclusion of a test for the applicability of the efficiency hypothesis conducted by Berger (1995), Choi and Weiss (2005) and Tregenna (2009).
7. References


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[Accessed 20110510]


8. Appendix

8.1 Received commissions total market Finland

![Graph showing received commissions in Euro for 2004 to 2009.](image)

Source: FSA Finland

8.2 Mediated premiums by intermediaries in Finland

![Bar chart showing mediated premiums by intermediaries in Finland from 2004 to 2009.](image)

Source: FSA Finland
8.3 Revenue per mediated premium 2004-2009

Source: FSA Finland

8.4 Market concentration measured as HHI for Sweden and Finland

Source: FSA Finland and Retriever database, firms registered by the Swedish FSA as insurance intermediaries
8.5 Market concentration measured as CR for Finland

Source: FSA Finland

8.6 Market concentration measured as CR for Sweden

Source: Retriever database, firms registered by the Swedish FSA as insurance intermediaries
### 8.7 Market Concentration Trends 2004-2009

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<thead>
<tr>
<th>Measure</th>
<th>Sweden</th>
<th>Finland</th>
<th>Denmark</th>
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</thead>
<tbody>
<tr>
<td>CR1</td>
<td>19.29%</td>
<td>16.87%</td>
<td>16.23%</td>
</tr>
<tr>
<td></td>
<td>14.86%</td>
<td>13.42%</td>
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</tr>
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<tr>
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<tr>
<td></td>
<td>28.71%</td>
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</tr>
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<td>% Change 2004-2009</td>
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<tr>
<td>CR5</td>
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<td>36.54%</td>
</tr>
<tr>
<td>% Change 2004-2009</td>
<td>-26.15%</td>
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### 8.8 Summary statistics market concentration trends

<table>
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<th>Denmark</th>
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<td>CR3</td>
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<td>CR5</td>
<td>-26.15%</td>
<td>12.77%</td>
<td>6.30%</td>
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</tbody>
</table>

Source: Retriever database, firms registered by Swedish FSA as insurance intermediaries, FSA Finland and Denmark
8.9 Data sample firms

The sample firms used in this study

<table>
<thead>
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</tr>
<tr>
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<td>2004-2009</td>
</tr>
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<td>2004-2009</td>
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<td>Pro Tuottavuus Oy</td>
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<td>2004-2009</td>
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<td>Risk Consult Oy</td>
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<td>IIZI Firstbrokers Oy</td>
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<td>RVM Yhtiöt Oy</td>
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<tr>
<td>Benefit Advisors Oy**</td>
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</tr>
<tr>
<td>Finanssiaura Oy</td>
<td>2004-2009</td>
</tr>
<tr>
<td>Avian Oy**</td>
<td>2004-2008</td>
</tr>
<tr>
<td>Finib Oy</td>
<td>2006-2009</td>
</tr>
<tr>
<td>Vakuutusmeklarit Ulf Kjerin Oy</td>
<td>2004-2009</td>
</tr>
<tr>
<td>JMN Riskienkartoitus Oy</td>
<td>2004-2009</td>
</tr>
<tr>
<td>Finpremium Oy</td>
<td>2004-2009</td>
</tr>
<tr>
<td>Novum Oy</td>
<td>2004-2009</td>
</tr>
</tbody>
</table>

*Operating margin missing 2004
**No data 2004-2005

8.10 Regression results with the market growth control variable excluded

Panel Least Squares Cross-section fixed (dummy variables) with White cross-section covariance estimator

Observations: 102

Dependent Variable: Operating margin

| Variable          | Coefficient | Standard Error | t-Statistic | p-value |
|-------------------|-------------|                |            |         |
| C                 | 0.408663    | 0.034068       | 11.99548   | 0.0000  |
| HHI               | -2.053722   | 0.215721       | -9.520284  | 0.0000  |
| MS                | 0.402162    | 0.184433       | 2.180535   | 0.0321  |

R-squared | 0.694943 | Durbin-Watson stat | 2.069952
8.11 Scatter plot showing operating margins for the sample firms

8.12 Market size Life insurance Sweden

![Bar chart showing premiums written in Sweden million SEK]

Source: The Swedish insurance association (Försäkringsförbundet)
8.13 Insurance market size Life insurance and statutory Pensions

![Premiums written Finland million Euro](image)

Source: FSA Finland

8.14 Number of active intermediaries in Finland

![Active intermediaries in Finland](image)

Source: FSA Finland
### 8.15 Total received commissions in relation to amount of mediated premiums in Finland

![Chart showing fees and commissions as a percentage of premiums over years 2001 to 2009.]

Source: FSA Finland

### 8.16 Numerical example of HHI

Below follows a numerical example to why HHI can be a more accurate tool to estimate market concentration compared to CR.

<table>
<thead>
<tr>
<th></th>
<th>Market A</th>
<th></th>
<th>Market B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales</td>
<td>Cumulative sales</td>
<td>Sales</td>
<td>Cumulative sales</td>
</tr>
<tr>
<td>1</td>
<td>325</td>
<td>325</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>350</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>375</td>
<td>100</td>
<td>325</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>400</td>
<td>75</td>
<td>400</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>425</td>
<td>50</td>
<td>450</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
<td>450</td>
<td>25</td>
<td>475</td>
</tr>
<tr>
<td>7</td>
<td>25</td>
<td>475</td>
<td>15</td>
<td>490</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>500</td>
<td>10</td>
<td>500</td>
</tr>
</tbody>
</table>

When using market concentration measures like CR 4 or CR 8, these markets appears to be equally concentrated. While the Herfindahl index clearly shows that market A is more concentrated than market B. The HHI values for the respective market are .440 for market A and .179 for market B.
8.17 Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating margin</td>
<td>0.121708</td>
<td>0,08</td>
<td>0,632</td>
<td>-0,545</td>
<td>0,194078</td>
<td>102</td>
</tr>
<tr>
<td>HHI</td>
<td>0.148241</td>
<td>0,13833</td>
<td>0,167555</td>
<td>0,125469</td>
<td>0,017631</td>
<td>103</td>
</tr>
<tr>
<td>MS</td>
<td>0.044705</td>
<td>0,01422</td>
<td>0,349106</td>
<td>0,000947</td>
<td>0,077775</td>
<td>103</td>
</tr>
<tr>
<td>Market growth</td>
<td>-0.040825</td>
<td>0</td>
<td>0,030474</td>
<td>-0.189845</td>
<td>0,077196</td>
<td>103</td>
</tr>
</tbody>
</table>

8.18 Qualitative research approach

To conduct a qualitative study, the researcher needs to perform interviews with market stakeholders to form a deeper understanding of the relevance of market structure to the insurance brokerage market. Results obtained from interviews are often colored by the author’s thoughts and subjective interpretation even if interviews conducted by two researchers mitigate some of this problem. Since significant empirical evidence is sought after, it follows that it becomes less appropriate to pursue qualitative research in this study.

8.19 Definitions

<table>
<thead>
<tr>
<th>Insurer</th>
<th>A life insurance company who offers insurance policies and manages the capital received from its policy holders. The policy usually includes insurance guaranteeing a specific sum if the policy holder dies or lives past a certain age.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer</td>
<td>The policy holder; a private person or a company that sets up pension solutions for its employees.</td>
</tr>
<tr>
<td>Intermediary</td>
<td>Can be exclusive or independent, exclusive intermediaries work for a single life insurance company and promote their insurance products solely. Independent intermediaries can offer insurance products from any insurance company and provide advice and recommend the best product and insurer for each consumer based on the consumer’s preferences.</td>
</tr>
</tbody>
</table>