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The Quality of Insurance Intermediary Services – Empirical Evidence for Germany^{*}

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Abstract

Insurance intermediaries help consumers to economize on information and transaction costs in insurance markets. However, competing insurance intermediaries provide heterogeneous services, which are difficult to assess by incompletely informed consumers. Transaction costs economics, search theory and principal agent theory provide arguments on product quality differences between the two main distribution channels in insurance markets (exclusive agents vs. independent intermediaries). The present paper uses a sample of 927 insurance intermediaries in Germany. By performing OLS estimations we test the impact of the different distribution channels, but also of other factors relating to the information processing activities on intermediaries' service quality. Depending on the proxies used for service quality, we find mixed evidence for the "product quality" hypothesis according to which independent intermediaries provide better service quality than exclusive agents. We find that service quality depends also to a large extent on the information gathering and processing activities of the individual intermediaries.

Keywords: Insurance Distribution Channels, Service Quality

JEL-Classifications: D83, G 22, L 15

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The Quality of Insurance Intermediary Services – Empirical Evidence for Germany

1. Introduction

There are profound information asymmetries between consumers and insurance companies in insurance markets. A number of institutions have evolved to mediate between consumers and insurance companies. In particular insurance intermediaries, like exclusive agents or insurance brokers, help to ease coordination and to further market transactions. They take an important position as match-makers between the supply and demand sides on insurance markets. On the one hand, they provide distribution and marketing services for insurance companies. On the other hand, they supply informational and advisory services for consumers. Insurance intermediaries assist in concluding an insurance contract by economizing on information and transaction costs. They provide low cost information to consumers about their risk profiles, insurance needs and suitable insurance products, thus reducing complexity for consumers.

However, while insurance intermediaries contribute to enhancing transparency in insurance markets, the market for insurance intermediaries is itself characterized by information lags. Consumers act under incomplete and asymmetric information about the quality of the information and advisory services provided by insurance intermediaries. These services are itself experience and credence goods. A consumer cannot assess the service quality provided by competing insurance intermediaries in advance, but only after information and advice have been “consumed”. However, even this is often barely possible. Especially for long-term insurance products like old-age or disability insurance, the quality of the information and advice given can be evaluated only after the insured risk has actually occurred – which often takes place decades later. Common business practices that have evolved over time add to the lack of transparency. This holds true in particular for remuneration practices and disclosure requirements about business relations between intermediaries and insurance companies. Consequently, consumers have only very restricted information about potential conflicts of interest and potential bias in the information and advice given by insurance intermediaries.

That insurance intermediaries indeed use these asymmetries to provide misleading and incomplete information to the detriment of consumers has been experienced in the UK in the 1990s on a wide scale (Davis 2004). In 1997 the British government started to pay billions of

British pounds to compensate millions of employees who had opted out of occupational pension schemes because of bad advice given by financial intermediaries.

Private insurance against the risks of longevity, illness or disability becomes more important also in countries with rather comprehensive social security systems because of the demographic changes ahead and because of financial pressure to reduce social security costs which arise from globalization. In addition, the introduction of a common insurance market in the EU in 1994 has led to fundamental changes in national insurance markets. By applying a liberal approach in regulating the insurance industry, countries like Germany or France introduced extensive deregulations in their formerly strictly regulated insurance markets. Although there are still no truly integrated EU-wide insurance markets, there is, nevertheless, more competition within the individual markets both with respect to prices and to product differentiation. Increasing product heterogeneity has two conflicting effects. On the one hand, it allows consumers to find products, which better match their preferences, thus increasing consumer welfare. On the other hand, it reduces market transparency, which may allow insurance companies to realize monopolistic profits. In this respect it decreases consumer welfare. Thus, taken together insurance intermediaries have become more important.

In this paper we try to shed some more light on the question of the service quality provided by insurance intermediaries. It is based on a sample of 927 German exclusive agents, independent agents and insurance brokers, which was carried out in 2001.

Insurance companies use multiple distribution channels to sell their products. The most important ones are exclusive agents, independent agents, insurance brokers and – for some years now – banks which also started to distribute insurance products. In Germany, direct purchasing through the internet also shows a growing, but still relative small share in selling insurance. While exclusive agents accounted for (estimated) 80% market share in 1985, they realized a rather strong decline to 27% in 2005 in the German market for personal insurance (Towers Perrin 2007). In contrast to that, insurance brokers, who accounted for only 14% in 1985, increased their share to nearly 33% in 2005. Banks which had a negligible segment twenty years ago raised their share to nearly 25% in 2005. It is estimated that exclusive agents will be further under pressure, with independent agents, insurance brokers and bank assurance still gaining market shares. All in all, there is a tendency among insurance companies to follow a multi-channel instead of a single channel distribution strategy (Trigo Gamarra 2007a).

Given the above mentioned changes on the demand-side and in market regulation, the declining relevance of exclusive agents in Germany seems to indicate that other intermediaries are better able to meet consumers' demand for information and related services when buying insurance. These empirical findings also touch the still controversial issue in the insurance literature about the coexistence of multiple distribution systems. There is an extensive discussion on whether exclusive agents and independent intermediaries provide fundamentally the same service quality or not. According to the market failure hypothesis their coexistence is a consequence of incomplete and asymmetric information in the insurance intermediary market, which allows the relatively more costly independent intermediaries to survive. On the opposite, the product quality hypothesis states that independent intermediaries provide better product quality than exclusive agents so that a separating equilibrium is realized.

We add to the existing literature on the service quality provided by different distribution channels in a number of ways. Most empirical studies so far concern the property-liability insurance business in the US. Our data instead focus on the German market with personal lines, where old-age provisions are of utmost importance. Besides, we explicitly use data from a survey among insurance intermediaries to account for differences on the service quality provided, while most of the empirical literature focuses on insurance companies that use different distribution channels. By this we provide some insights on other factors that explain quality differences between intermediaries despite them belonging to a certain distribution channel. Finally, we use a different approach in how to measure the service quality provided by intermediaries. In this way we contribute to the literature on empirically testing for service quality in insurance intermediary markets.

The paper is structured as follows. In *section 2*, we discuss in more detail the relevant theoretical and empirical literature and derive our main hypotheses. In *section 3* we describe the German market for insurance intermediation, our data and the estimation methods used. The estimation results are presented and discussed in *section 4*. *Section 5* summarizes and concludes.

2. Literature Review and Hypotheses

In the following we give an overview of the relevant literature which deals with the service quality provided by insurance intermediaries. Based on a review of the main theoretical

arguments and empirical findings, which employ transaction cost economics, search theory and principal-agent theory, we formulate four main hypotheses.

Theoretical Insights on Insurance Intermediaries' Service Quality

Insurance markets are characterized by incomplete and asymmetric information between insurance companies and consumers (Cummins/ Doherty 2006; Eckardt 2007). Due to the complexity of insurance coverage consumers need information about their risks, insurance product and contract design as well as about claims settlement, investment behavior and financial stability of insurance companies. Because of the long-term nature of most personal insurance, information must be gathered, processed and assessed repeatedly. This requires special skills and expert knowledge in many different areas, like insurance mathematics or contract law. Moreover, in order for the whole transaction to take place, other activities beyond information search must be carried out. Bargaining and administrative activities, which arise whenever the terms of the insurance contract are (re-)negotiated and/or loss settlement takes place, are the most important ones. Like information acquisition and assessment, these activities also require special knowledge and skills. Thus, they cause costs for the necessary investment and for the time spent in carrying them out. Taken together these costs add up to total transaction costs. On the other side, insurance companies also need information about consumers' characteristics and behavior to provide adequate risk coverage. These activities can be performed either personally or with the help of intermediaries, who are specialized in providing such informational, bargaining and administrative services. Generally, consumers and insurance companies will turn to intermediaries whenever intermediated exchange creates greater net gains from trade than direct exchange (Spulber 1999, 256–286). Intermediaries can realize such higher net gains by reducing transaction costs.

Transaction cost theory and search theory show that intermediaries help to economize on information and search costs and also provide additional services so that total transaction costs decline. Thus, they explain the existence of markets for insurance intermediaries. Reasons for lower transaction costs of intermediated exchange are (1) coordination cost savings and positive network externalities, (2) absolute cost advantages because of division of labor, specialization and learning effects over time as well as (3) economies of scale and scope with respect to the fixed costs of a transaction (Rose 1999, 58–66; Spulber 1999, 262–266). Coordination costs are lower in intermediated than in direct exchange since the number of contacts between potential

trading partners is reduced. By involving an intermediary, the number of marketing channels is reduced due to the fixed costs associated with coordinating potential trading partners. This leads to further cost reductions because of the increasing returns realized. Above that, there are also positive network externalities if the intermediary acts as a communication center (Baligh-Richartz effect, Rose 1999, 60). Besides, transaction cost reductions result from higher productivity as a consequence of specialization and division of labor, learning effects over time and economies of scale and scope. Whereas in direct exchange consumers perform the activities related to the insurance transaction only for this particular transaction, intermediaries in insurance markets perform these activities more frequently and for a higher volume of transactions. In this manner gains can be realized by assisting in searching and matching, negotiating, monitoring, and executing insurance transactions. While a single consumer uses investment in human capital, search technologies or expertise to increase the productivity of transactional activities only for the transaction at hand, an intermediary can repeatedly use the same information. In this way, economies of scale and scope are obtained. All in all, intermediaries in insurance markets can improve market transparency between the two market sides at lower costs than under direct exchange (see *Table 1*).

Table 1 Transaction Cost Reductions from Intermediation

Transaction Stages	Intermediary Service	Cost Reduction
Searching and matching	<ul style="list-style-type: none"> • direct sales of information • matchmaking • market-making 	<ul style="list-style-type: none"> • search costs • information costs • opportunity costs of time
Availability of products and immediacy	<ul style="list-style-type: none"> • compensation of variances in demand and supply 	<ul style="list-style-type: none"> • opportunity costs of time
Negotiating and Contracting	<ul style="list-style-type: none"> • strong bargaining position • exploitation of differences in contract terms between supply and demand market side • to standardize contracts 	<ul style="list-style-type: none"> • negotiation costs • information costs • administrative costs • opportunity costs of time
Monitoring and Guaranteeing	<ul style="list-style-type: none"> • expertise in determining product and service quality • cross-sectional and temporal reuse of information • guaranteeing high product quality 	<ul style="list-style-type: none"> • information costs • monitoring and control costs • costs resulting from uncertainty • investment in expertise

Source: Following Rose (1999, 65, Table 6).

From search theory a number of factors that affect the service quality provided by insurance intermediaries can be identified (Posey/ Yavas 1995; Posey/ Tennyson 1998; Seog 1999, 2005;

Eckardt 2007). On the demand side, consumers' preferences in regard to insurance related information and other transaction services and their transaction costs influence their make-or-buy decision. Besides, many information services depend on privately held information by consumers. Thus intermediation service quality depends also on the collaboration between consumers and intermediaries. On the supply side, the distribution of the relevant information as well as the search technology used are important factors that affect the search costs which have to be incurred for producing information and other services of a certain quality level (Rose 1999; Eckardt 2007). Most important inputs are the time spent for searching, processing and evaluating information and investment in specific insurance-related human capital (knowledge and skills).

Insurance intermediaries differ by their legal status. Exclusive insurance agents represent exclusively the products of a single insurance company, whereas joint or independent insurance agents sell policies of different insurance companies, but normally for each line of insurance only from one insurance company. Opposed to the latter, insurance brokers are independent from insurance companies and principally distribute all insurance products available on the market. In the US, independent agents and insurance brokers own the client list, while in case of exclusive agents the insurance company decides on contract renewal. In contrast to that, in Germany insurance companies own the client list in any case, even when insurance is distributed by independent agents and insurance brokers (Zinnert/ Griess 1997). Nevertheless, also in Germany independent intermediaries are legally required to provide more comprehensive information than exclusive agents to their customers, otherwise they might encounter legal sanctions. Despite these differences, the various types of intermediaries nevertheless compete for the same consumers, in particular, if they distribute personal lines (Cummins/ Doherty 2006).³ Barriers to entry are usually low in the local or regional markets served by insurance intermediary firms. Insurance intermediaries are remunerated by commissions paid directly by insurance companies. These commissions are a percentage of the premiums sold to consumer.⁴ Since consumers act either under a "free price"-illusion or simply do not know about what percentage of the premiums they pay go to insurance intermediaries, price competition is quasi not existent in the market for

³ Note that in this paper we are not concerned with bigger insurance brokerage firms which are specialized in commercial insurance lines and act on a national or international basis (Cummins/ Doherty 2006).

⁴ There are also so-called contingent premiums which are independent of premiums. But they account only for a rather small amount of intermediaries' total revenues (Cummins/Doherty 2006).

insurance intermediation (Cummins/ Doherty 2006). Thus, insurance intermediary markets are characterized by monopolistic competition (Cummins/ Doherty 2006; Eckardt 2007). Insurance intermediaries compete for customers both by horizontal and vertical product differentiation. In the former case they offer different kinds of services, while in the latter they offer different quality levels.

Insurance intermediary markets are also characterized by incomplete and asymmetric information. Information and counseling services on complex and long-term insurance purchase decisions are experience and credence goods (Nelson 1970; Darby/ Karni 1973; Hirshleifer 1973). According to principal-agent theory this information asymmetry leads to low quality provision due to differing objectives between principals and agents. Consumers as principals have only incomplete information about an intermediary's (= agent's) characteristics, knowledge and experience before contract conclusion as well as about the intermediary's proper intentions and actions after contract conclusion. Therefore the performance of the agent can be only incompletely assessed by the principal. She cannot correctly assess whether a particular performance is the proper result of the contractually agreed efforts of the agent under the given circumstances or the consequence of a contract violation. Since not all contingencies can be explicitly specified *ex ante*, there are incomplete contracts. Therefore contract fulfillment can be only incompletely enforced by courts *ex post* as well. As a consequence of the agent's privately held information, adverse selection and/ or moral hazard may occur. Accordingly, no separating equilibrium should occur, leading to overall low service quality in the market for insurance intermediation (Gravelle 1993; Horsch 2004; Kurland 1995, 1996).

Along these lines of reasoning, there is an extensive literature which analyzes the coexistence of insurance distribution by exclusive versus independent intermediaries from an agency or transaction cost perspective (Berger/ Cummins/ Weiss 1997; Regan/ Tennyson 2000). It has provoked a vivid discussion as to whether the persistence of independent agent distribution systems results from profound inefficiencies in the insurance market (*market imperfection hypothesis*) or whether it is based on specific services provided by independent agents (*product quality hypothesis*) (Berger/ Cummins/ Weiss 1997). Authors supporting the latter hypothesis argue that independent intermediaries are legally seen as representing the interests of policy holders. In case of low information service quality, they could be legally sanctioned. Besides, since they own the client list, they can credibly threaten insurers to switch to another company.

Accordingly, it is stated that independent intermediaries have incentives to provide better services to consumers than exclusive agents so that a separating equilibrium arises despite profound information asymmetries. In particular, independent intermediaries seem to be of advantage in mitigating agency problems between shareholders and policyholders which result from organizational form (Mayers/ Smith 1981; Kim/ Mayers/ Smith 1996; Regan/ Tzeng 1999; Baranoff/ Sager 2003). In contrast to that, vertical integration and thus reliance on exclusive agents seems to be more profitable for insurance companies to induce a high level of sales efforts from agents (Sass/ Gisser 1989). The same holds when insurers rely heavily on advertising (Marvel 1982, Grossmann/ Hart 1986) or on relation-specific investment (Regan 1997).

Empirical Findings on Service Quality

Most of the empirical studies carried out to test for the market imperfection vs. product quality hypothesis show a clear cost advantage of direct writers compared to independent agent insurers (Joskow 1973; Cummins/ VanDerhei 1979; Barrese/ Nelson 1992)⁵. They also seem to be better suited than exclusive agents for tailoring insurance coverage to consumers' needs in insurance lines where complexity is high and risk assessment of customers becomes more difficult (Regan/ Tennyson 1996; Regan 1997, Regan/ Tzeng 1999). There is mixed evidence whether independent agents or brokers offer better service quality as measured by claims settlement data than exclusive agents (Doerpinghaus 1991; Barrese/ Doerpinghaus/ Nelson 1995). There is also evidence for the US market that independent agents are less beneficial for larger insurance firms and larger market size and for those in which long-term relations are valued (Berger/ Cummins/ Weiss 1997; Regan/ Tennyson 1996, 2000; Regan 1997; Regan/ Tzeng 1999).⁶

These studies do not explicitly deal with the service quality provided by single intermediaries, but concentrate on differences in the relative efficiency of insurance companies that use different distribution systems. They focus primarily on the US insurance market, in particular regarding property-liability insurance. The units of analysis are not insurance intermediaries, but insurance companies. The impact of exclusive versus independent intermediaries on insurance companies'

⁵ However, see Trigo Gamarra (2007a) who finds for the German life insurance industry no cost advantage of direct insurers compared to multi-channel insurers. Independent agents show both lower cost efficiency and lower profit efficiency than multi-channel insurers.

⁶ Besides findings are not uniform when analyzing whether independent intermediaries are more advantage in mitigating agency problems. While there are positive results for the US (Kim/ Mayers/ Smith 1996; Regan/ Tzeng 1999; Baranoff/ Sager 2003), Ward (2003) finds just the contrary for the UK.

performance is analyzed by including a dummy variable which accounts for the main distribution channel used. Therefore these studies do not allow any statements about quality differences between single intermediaries belonging to the same distribution channel nor on the factors affecting such differences.

There are only very few econometric papers that study more comprehensively the service quality provided by single insurance intermediaries. The findings of Etgar (1976) do not support the hypothesis that independent agents provide overall better service quality than exclusive agents. They are significantly more active in claims settlement than exclusive agents, but there is mixed evidence on their service quality regarding assistance in risk analysis and in placing insurance applications. Cummins/ Weisbart (1977) obtain similar results in a study on insurance intermediaries, which operate in three different US states in personal insurance lines. Again, independent agents are found to provide better claims settlement services and to review coverage more often, while they provide less service quality than exclusive agents in other dimensions. Eckardt (2002) provides a study based on German exclusive agents and insurance brokers, who are mainly engaged in personal lines. Mean differences parametric tests reveal a number of highly significant differences in both quantitative and qualitative variables that support the product quality hypothesis. This is in line with the findings of Trigo Gamarra (2007b). For a sample of exclusive and independent intermediaries active in the German life insurance industry she finds evidence that supports the product quality hypothesis. According to her results, the independent intermediaries show higher service quality than exclusive agents in regard to a number of different input- and output indicators, which measure service quality and performance. Like the product quality hypothesis states, service quality increases with the share of complex insurance products in an intermediary's portfolio and with the number of additional services provided.

Hypotheses

All in all, there is mixed empirical evidence in regard to the product quality hypothesis. No conclusions can be drawn on other factors affecting service quality differences between intermediaries. Thus, from the above discussion of transaction cost, search and principal agent theory we draw the following hypotheses. *Hypothesis 1* states that independent intermediaries provide better service quality than exclusive agents (**product quality hypothesis**). From principal agent theory it follows that a separating equilibrium between intermediaries with

different service quality emerges, if credible signals are given. Since insurance brokers can be legally sanctioned when not providing a certain (high) level of service quality, being an independent intermediary should be such a credible signal, implying better service quality than it is provided by exclusive agents. Besides, principal agent theory states that the lower the information asymmetries between principals and agents are, the better the product quality should be. Accordingly we contend that the better customers' knowledge about insurance relevant matters is, the higher the service quality provided should be.

In contrast to hypothesis 1, the following hypotheses 2 to 4 analyze a number of additional factors that might explain quality differences between intermediaries, independent of their legal status.

Hypothesis 2 states that **specialization, economies of scale and scope** should have a positive impact on the service quality provided by an intermediary. From transaction cost economics and search theory it is derived that specialization and economies of scale reduce search costs for producing a particular quality level of service quality. With an increase in firm size insurance intermediaries can specialize in certain informational processing activities as well as in providing additional services. Thus, with an increase in employees, an intermediary firm can realize economies of scale. Besides, there might also be positive effects due to specializing on the products of a certain insurance company as well as on a certain line of insurance or on particular customer segments. In each case, specific information about a particular insurance company and her products, about a particular insurance line or about the particular risks and insurance needs of a certain customer segment can be used more often, once gathered by a specialized insurance intermediary compared to a non-specialized one. In addition, by providing additional insurance-related services like financial counseling or claims settlement an intermediary can gain additional information about customers' needs and preferences as well as about insurance companies' products and behavior. If such information is used in giving advice and counseling, information and service quality is increased by reducing the underlying information asymmetries consumers and insurance companies. Thus, additional services might entail economies of scope.

Hypothesis 3 states that the more **efforts** are spent by an intermediary on producing information services, the higher the service quality offered. More precisely, since providing information and giving advice on insurance transactions requires knowledge and skills on insurance economics, financial markets, social security and contract law to name just a few. In line with the theory it is

contended that the higher investment in insurance-relevant knowledge and skills is, the better the information gathered in the search process by an intermediary will be processed, eventually resulting in better service quality. Besides, we contend that the more time is spent on searching and processing information and on counseling customers, the higher the service quality provided by intermediaries is, independent of whether they are exclusive agents or independent intermediaries. According to search theory the larger the proportion of time devoted to information acquisition and processing or to counseling interviews is, the more information about insurance products and their characteristics as well as about the specific needs of the clients can be gathered and the higher the information quality would be.

Finally, *hypothesis 4* takes into account that the service quality provided by an intermediary also depends positively on the quality of the **informational input**. From search theory we derive that the quality of the information gained in search depends on the quality of the underlying information sources. The better these are and the better the acquired information is, the higher the service quality. In addition, from principal agent theory we derive that the quality of advice given by an intermediary also relies on privately held information by customers. Thus, we contend that the better the cooperation between the customer and the intermediary, the higher the service quality provided by the latter should be.

Thus, we test the following hypotheses:

H 1 - Product Quality Hypothesis: Independent intermediaries provide better service quality.

H 2 - Specialization, Economies of Scale and Scope: Specialization and economies of scale and scope lead to better service quality.

H 3 - Efforts Spend: The more an intermediary invests in general and insurance-specific human capital (knowledge and skills) and the more time an intermediary spends on information processing and counseling interviews, the better the service quality provided.

H 4 - Informational Input: The better the information sources used by an intermediary are, the more information about relevant subjects an intermediary provides in counseling interviews and the more consumers' cooperate, the better is the service quality provided.

Table A.1 in the Appendix summarizes the hypotheses to be tested, the independent variables and the expected relations. Hypothesis H 1 tests for the product quality hypothesis, while hypotheses

H 2 to H 4 refer to additional factors that affect the quality of the services provided by insurance intermediaries.

3. Data and Estimation Methods

The German Market for Insurance Intermediation

The German market for insurance intermediaries was widely unregulated until 2007 (Mauntel 2004; Rehberg 2003).⁷ There were no formal entry restrictions other than having a trading license. To get such a license from the Trade Supervisory Office (Gewerbeaufsichtsamt) required only having a certificate issued by the police stating that the holder had no criminal record. No registration, financial skills or financial guarantees were mandatory. Conduct regulation was also very weak. Exclusive agents differ from independent intermediaries regarding the legal responsibilities in regard to the kind and amount of information provided to consumers. For exclusive agents the respective insurance companies are held responsible in case an agent provides false or misleading information about policy benefits, terms and conditions, dividends or premiums. To independent intermediaries more strict liability rules in case of professional negligence apply. Nevertheless, professional indemnity insurance was not compulsory. Disclosure regulations were of a rather general nature as well. It was neither prescribed in detail what information had to be passed to consumers, nor in what form had this to be done. Besides it was customary that consumers were not informed on the commission and fees intermediaries received as part of the insurance premiums for their services. Therefore, they can be said to have acted under a “free fee” illusion. As a consequence there was no price competition in the German market for insurance intermediaries. Finally, there was a general ban on rebating commissions both for insurance agents and brokers. That is, for insurance intermediaries, resale price maintenance was legally sanctioned.

Our data is obtained from a survey among 4,687 self-employed German insurance intermediaries, which was carried out in autumn 2001. The addresses of the interviewees were randomly chosen from online directories and from the yellow pages. 927 insurance intermediaries answered the

⁷ Because of reforms of the German insurance law and the implementation on the EU Directive on Insurance Intermediation now stricter rules apply to insurance intermediaries. But these new rules are of no importance for the following analysis, since our survey was carried out in 2001.

questionnaire, implying a response rate of 20%.⁸ Among the respondents 423 are self-employed exclusive insurance agents, 504 independent intermediaries.⁹ Data was collected about individual and firm characteristics of the interviewed insurance intermediaries, the services offered, the intermediation process and general market conditions.¹⁰

Dependent Variables

Insurance intermediary services comprehend mainly information services, but also additional services, like risk assessment, claims settlement or loss management. Since services are intangible, their quality cannot be measured in an objective way. Therefore, we estimate four different performance measures in markets for insurance intermediation. The first three, *information index*, *additional services* and *service index* are input-oriented, measuring information and additional services provided by intermediaries. The last one, the *contract conclusion rate*, is a proxy for insurance intermediaries' economic success. It indicates whether providing service quality is economically profitable for insurance intermediaries. Besides, it can be also seen as a more subjective output-oriented indicator pointing to how content customers are with the service quality provided.

The variable *information index* is a proxy for the information quality provided by insurance intermediaries. It is a summary indicator that captures the weight that an insurance intermediary attaches to 27 subjects about a customer's need for insurance protection, insurance products and

⁸ Since there are no market data available on the service quality provided by insurance intermediaries, the optimal way of collecting information about insurance intermediaries' service quality would be to conduct a high enough number of mystery shopping interviews and then combine them with data about the interviewed intermediaries' service production activities. However, due to financial constraints this was not possible, so that a survey was carried out. Although this might entail committing a type II error, our sample size seems reasonably large enough to avoid it. The potential of committing such an error can be further reduced by increasing the significance level and thus the potential of committing a type I error, since both errors are inversely related. For more details on this see Diekmann (2000, 585-602), Stock/ Watson (2003, 68-69).

⁹ As there has been no legal duty to register for insurance intermediaries in Germany at that time, the total population is unknown. The sample represents the regional demographic distribution of the German population well (Federal Statistical Office 2004, 26). It also captures the main distribution channels, which account for two thirds of the total premium income gained in the German insurance market in 2001 (GDV 2002).

¹⁰ As the pretest showed a very low willingness to answer questions to remuneration patterns, costs, turnovers, and profits, they were omitted from the survey. For empirical evidence on compensation schemes see Zweifel/ Ghermi (1990), Laslett/ Wilsdon/ Malcolm (2002) and Cummins/ Doherty (2006).

coverage, policy design and contract terms.¹¹ Half the items deal with the particularities of private old-age insurance. This is justified by the fact that this insurance line makes for the largest share of the interviewed insurance intermediaries' income (Eckardt 2002). For each item the interviewee is asked how much importance (with 1 = *totally unimportant* to 5 = *very important*) he gives to it in his counseling interviews. Then, for each intermediary the mean value is calculated after summing up all 27 items. Although this input-oriented variable is concerned with the content of the information provided, it makes neither statements about the actual information provided nor whether the information provided is accurate from an objective point of view since participants may overstate their service quality. However, response bias can be reasonably assumed to occur similarly for all interviewees (Etgar 1976).¹² As a consequence however, our focus is not on the values of the coefficient estimates reported in the regressions, but on their signs.

Since insurance intermediaries not only provide information, but also additional transaction related services, we use the variable *additional services*, which measures how many additional services are supplied to consumers besides information services. Finally, we construct an aggregate *service index* variable as a proxy to account for total service quality provided. For this we normalise the *information index* and the *additional services* variables before aggregating them additively. Since we assume that information services are the most important services provided by insurance intermediaries,¹³ the *information index* variable enters the *service index* with double weight compared to the *additional services* variable.

As a further measure we use the *contract conclusion rate* variable as a proxy for market performance and economic success. It indicates the percentage of counseling interviews an intermediary conducts that on average result in consumers actually concluding an insurance

¹¹ These items result *inter alia* from interviews with experts on consumer protection in personal insurance. For more details on the single items, see the variables underlying the factor analysis in *Tables A.4 and A.5* in the *Appendix*.

¹² The results of the mean difference parametric tests in Eckardt (2002) indicate that there is only weak response bias.

¹³ See in *section 2* above the reasoning of transaction costs economics and search theory on insurance intermediaries as information intermediaries.

contract.¹⁴ It shows whether the provision of high information quality positively influences an intermediary's economic performance. In addition, this output-oriented variable can be also interpreted as a more subjective indicator of the service quality provided. It indicates whether customers are satisfied with the information and advice given by an intermediary during a counseling interview as with the additional services provided. Accordingly, the higher an intermediary's contract conclusion rate is, the better is her service quality as subjectively perceived by consumers.

Independent Variables

The behavior of insurance intermediaries may differ according to their (in-)dependence from insurance companies and because of different regulatory rules. The variable *intermediary type* distinguishes between the distribution channels *exclusive agents* and *independent intermediaries*.¹⁵ Intermediaries help consumers to reduce search costs because they are assumed to have a better market overview, thus providing more comprehensive information about a number of different insurance companies and their products.

While independent agents and brokers provide information about a number of different insurance companies, exclusive agents however, represent only a single insurance company and its products. Although this implies that they provide less comprehensive information than independent intermediaries, the overall effect on the service quality might be ambiguous. By specializing on a particular insurance company, an intermediary can gain an in-depth knowledge of this particular insurance company and its products that an intermediary with a broader market overview might not have. To account for this potentially offsetting effect, we include the variables specialization on an *insurance company* and its products and *insurance company reputation*. It measures what weight intermediaries attach to the insurance company whose products they distribute for gaining high reputation themselves. By this we take into account that specialization on a certain insurance company might be the outcome of a deliberate selection process. If an exclusive agent chooses to work for a high quality insurance company, he can benefit from its reputation and concentrate on providing in-depth information about its products.

¹⁴ Note that this success rate is not a profitability measure since it provides no information on the premiums of the contracts concluded or on the costs spent by them.

¹⁵ Note that independent intermediaries comprehend both independent agents and insurance brokers. Accordingly we use these terms synonymously in the following.

To further capture the impact of specialization effects and economies of scale in producing intermediation services, we include a number of other variables which account for *firm size*, specialization on a certain *insurance line* (old-age insurance) and on *customer segments*. The more specialized an insurance intermediary is in these respects, the better the information quality provided should be, since she can realize economies of scale. Besides, we asked for the number of additional services provided (*additional services*) to see whether there are economies of scope. Finally, to control for the impact of competition in the markets of insurance intermediation we add a variable that measures the *competitive pressure*. It follows from monopolistic competition that an increase in competition should result in a higher degree of product differentiation. In our case this would imply better information quality and more additional services, the higher the competitive pressure.

The questionnaire inquired about human capital variables as inputs used for producing information and transaction services. The *age* of the intermediary and investment in human capital (*formal education, (additional) training, university degree, work experience, further training*) are proxies to account for service quality.¹⁶ Besides, the participants were asked which percentage of their total *time budget* they spent on different activities (*information acquisition and processing, counseling interviews, further training, claims settlement, sales efforts*). Furthermore, the average duration of counseling interviews in absolute terms is used to account for the quantitative input to service production (*duration_interviews*).

The quality of the information provided depends also on the quality of the information sources used. To gain information about this aspect, we calculate the variable *information source* as the product of the importance of a certain information provider (like an insurance company or a rating agency) to an intermediary and the objectivity she attaches to it. For further trainings there is no variable that shows the credibility attached to it as a reliable information source. Therefore, *source_further training* indicates only the importance of this information source without making statements about its perceived objectivity by an intermediary. We expect that intermediaries, who rely strongly on more credible information sources, provide better information quality to their customers.

¹⁶ Such proxies are widely used in empirical studies on relationship lending to account for the quality of lenders and thus to assess the degree of asymmetric information between banks and their customers. See for example Berger/ Udell (1990) and Neuberger/ Raethke-Doepfner (2008).

To account for the *information content* provided, the interviewees were asked which weight they give to 27 different aspects in counseling interviews that are relevant from an objective point of view for consumers to decide rationally about insurance coverage (see above *information index*).¹⁷ It is assumed that an intermediary informs her customers more extensively about those aspects to which she attaches more weight. Together with general information, product information and information on contract design, the interviewees were questioned about particular topics relevant for old-age insurance. Furthermore, as the participation in surplus is an important sales argument for life assurances, different items were asked about this subject to see how much weight intermediaries put on informing consumers about the components of the calculations normally used. By performing a factor analysis, seven factors were extracted which are used as independent variables to account for the information content provided (*Tables A.4 and A.5 in the Appendix*).¹⁸ They comprehend information on *personal risk profile and security options, general aspects on insurance, private old-age insurance products, policy design, contract design, contract execution and calculation of participation rates*.

Differences in *customers' knowledge* about insurance matters can also lead to differences in the information quality provided, since it reduces information asymmetries between consumers and intermediaries. Generally, the more knowledge consumers have about insurance relevant subjects, the higher the information quality of an intermediary is expected to be. Otherwise, there is the threat that discontent customers would turn to another intermediary. Besides, the production of information services is the result of a cooperative effort. Besides, the quality of the advice given by an intermediary also depends on information privately held by a customer. The more knowledge a customer has on insurance relevant matters, the less effort the intermediary has to spend to extract this information by the customer.

We also include two consumer demand variables; one that measures customers' *demand for information services* and one that accounts for their *demand for additional services for free*. We asked whether such demand of an intermediary's customers has increased over the last six

¹⁷ Since the dependent variable *information index* is based on the same 27 items, the following variables are only used as regressors on the *additional services* and on the *contract conclusion rate* variables. See models 2 and 4 in *Table 1* below.

¹⁸ Although factor analysis assumes interval data, Jaccard and Wan (1996, 4) summarize in a review of the literature on this topic that with ordinal Likert scale items "for many statistical tests, rather severe departures (from intervalness) do not seem to affect Type I and Type II errors dramatically."

months. In 2001, pension reform had been high on the public agenda in Germany and had been widely covered in the media. To cope with the demographic changes ahead, reforms entailed the introduction of tax-subsidized private pensions in addition to the so far rather comprehensive public pension schemes. Accordingly, given the rather agitated public (and private) debates about the future of one's pension entitlements, a higher demand for information services should have a positive impact on the information and service quality actually provided. The same holds for the demand for additional services.¹⁹ Customers' knowledge and demand variables are also proxies for how intense cooperation between an intermediary and his customer is. The more intense it is, the more privately held information consumers' are assumed to disclose.

Estimation Methods

The hypotheses are tested by using OLS-estimations,²⁰ since the service quality depends primarily on supply-side factors. As there is imperfect and asymmetric information on consumers' side about the true information quality provided by intermediaries, the feedback mechanism between insurance intermediaries' service quality and the number of consumers using them is strongly weakened. Accordingly, we can use OLS instead of, for example, Two-Stage-Least-Squares (2SLS) estimations, which should be otherwise applied to avoid simultaneous equation bias.

In addition, there are also methodological reasons for using OLS. Most importantly, we are not aware of any meaningful variable which could be used as an instrument in 2SLS or other related estimation methods.²¹ Intermediaries' services are mainly intangible goods which are produced by interaction. The service quality provided by an intermediary depends to a large degree on gaining information of his or her customers' preferences, needs, and risks through communication. Such information is an input factor in producing high quality information services. Thus, during a counseling interview an intermediary can obtain information about

¹⁹ *Table A.2* in the *Appendix* summarizes the definition and measurement of the variables. The main descriptive statistics of the variables are reported in *Table A.3* in the *Appendix*.

²⁰ For the assumptions of the linear OLS regression, see Greene (2000, 210-264). The estimations are corrected for heteroscedasticity where necessary. For multicollinearity see the correlation matrix in *Table A.6* in the *Appendix*.

²¹ For this, a variable should affect only consumers' demand for service quality, but have no impact on intermediaries' decisions on their quality supply, that is it should be both relevant and exogenous, see Stock/Watson (2003, 331-372).

variables that affect his customers' demand for information quality. Because of the prevalent information asymmetries, the intermediary can use this information to his own advantage in supplying his profit-maximizing quality level. Because all variables that affect consumers' demand for service quality can be communicated in counseling interviews, therefore they also affect the service quality actually supplied by an intermediary. Thus, they are not exogenous and therefore cannot be used as an instrument in 2SLS. Besides, we are not concerned with the absolute values of the estimated coefficients, but only with their signs. Finally, we have no information on the number of consumers or the sales volume of the single intermediaries. Thus, from a quite practical point of view OLS is the best solution to estimate the service quality provided by an intermediary.

For the independent continuous variables *age*, *work experience*, *further training_number*, *duration_interviews*, *information source*, *source further training* and *additional services* we assume that they have a positive, but decreasing effect on the service quality provided. Thus, we use their log in the estimated equations. For the dependent variables *information index*, *additional services* and *service index* we perform semi-log OLS-estimations. For the *contract conclusion rate* as dependent variable we apply a logistic function (Cooper/ Nakanishi 1988). This accounts for the fact that, when starting from a low level, increases in inputs first result in disproportionately high and then in disproportionately low increases in the contract conclusion rate.

All in all, we perform three specifications for each dependent variable. Models 1 to 4 test for the product quality hypothesis (*hypothesis 1*) and for specialization and economies of scale and scope (*hypothesis 2*), while models 5 to 8 test for the impact of the efforts spend (*hypothesis 3*) and of informational inputs (*hypothesis 4*). The effect of combining all hypotheses is shown in models 9 to 12. For the variables used in each specification see *Table A.1* in the Appendix. The results are discussed in the following section.

4. Estimation Results and Discussion

The empirical results of the OLS regression equations are reported in *Tables 1* and *2* below.

[**Table 1** about here]

Hypothesis 1 – Product Quality Hypothesis

The product quality hypothesis states that independent intermediaries provide better service quality than exclusive agents. According to all our models, this is confirmed when using the *information index* or the *contract conclusion rate* as dependent variable. Compared to being an independent intermediary, being an exclusive agent and, thus, more dependent from insurance companies has a significantly negative impact both on the information quality provided and on the contract conclusion rate realized. These findings confirm *hypothesis 1* according to which information quality should be the higher the more independent intermediaries are from single insurance companies. Independent intermediaries provide significantly better information services, which is also honored by customers in that they realize better market performance than exclusive agents.

While these results support the product quality hypothesis, when using *additional services* as dependent variable we find quite the opposite effect, with exclusive agents providing a significantly higher number of additional services. This finding might be due to the particularities of monopolistic competition, which characterizes the market for insurance intermediaries. Exclusive agents are more constrained than independent intermediaries when it comes to vertical product differentiation. Since they depend in regard to the number and quality of the insurance products they distribute on the insurance company they represent, they are more constrained in increasing information quality. Thus they have to rely more on horizontal product differentiation, i.e. on offering additional services. This finding is supported by our estimations, as the variable *insurance company reputation* has a significantly positive impact on the information quality in model 1, while it has a significantly negative impact on the number of additional services provided in model 2. Intermediaries which are convinced on the quality of the insurance companies they represent specialize more in providing high quality information services and offer fewer additional services. However, this does not result in a significant increase of market performance as measured by the *contract conclusion rate*.

Finally, when using the *service index* as dependent variable we find no statistically significant differences between exclusive agents and independent intermediaries. Obviously this results from the contrary effects that exclusive agents show on information services resp. additional services as shown in models 1 and 2, for example.

From principal agent theory we derived that customers' knowledge reduces information asymmetries and thus leads to an increase in the service quality provided. However, according to our estimations service quality does not depend on the degree of information asymmetries between consumers and intermediaries as measured by *consumers' knowledge* about insurance related matters (models 1 to 4).

All in all our data give mixed evidence on the product quality hypothesis, depending on the proxies we use to account for service quality. Our estimations support that independent intermediaries provide better quality in regard to information services, which also shows in better market performance. In contrast, we find no differences between exclusive and independent intermediaries in regard to total service quality, while the product quality hypothesis even has to be rejected with respect to additional services.

Hypothesis 2 – Specialization and Economies of Scale and Scope

Models 1 to 4 also test for the impact of specialization and economies of scale and scope on the service quality provided by insurance intermediaries. The coefficient estimates for *firm size* show no significant impact on the quality of the information services, the total service quality or the contract conclusion rate. Only for additional services we find a significantly negative effect for small firm size. Obviously, it does pay less for smaller intermediary firms to offer additional services than for larger ones. Besides, also specialization on a certain *insurance company* and its products shows no statistically significant coefficient estimates. In contrast to that, specialization on old age insurance has a significantly positive impact on both the provision of additional services as well as on total service quality (models 2 and 3). There are a number of different products to account for old age provisions, like life insurance or annuities, but also investment funds. This provides ample scope for intermediaries to offer additional services like financial counseling, investment found business etc. to consumers, which in turn also increases total service quality. We also find a positive impact for specialization on *customer segments* on the information quality and the total service quality provided, which is also statistically significant in models 1 and 3. As theory suggests, intermediaries that specialize on particular customers can reuse information for this segment more often. Accordingly it pays for them to invest more in acquiring and processing information which is specific to this particular customer segment, which in turn results in higher information and service quality. However, according to model 4 this does not reflect in a higher *contract conclusion rate*.

Finally, when using the variable *additional services* as independent, we find significantly positive coefficient estimates for the *information index* and the *contract conclusion rate*. Obviously, providing more additional services increases the quality of the information services provided and also results in a higher contract conclusion rate, thus reflecting consumers' satisfaction with an intermediary's services. Thus, our findings seem to support the thesis that economies of scope can be realized.

When controlling for *consumers' demand on information provision* and on *additional services for free*, our estimations show a mostly significantly positive impact on the *information index*, *additional services* and the *service index* in all our models. However, there is no statistically significant effect on the economic performance as measured by the *contract conclusion rate*. When controlling for efforts spent and informational inputs in models 6 and 10, we find that high demand for information services by consumers significantly reduces the number of additional services provided. All in all, intermediaries seem to take the demand of their customers into account in the extent and type of services provided. Note that competitive pressure has a significantly negative impact on the *contract conclusion rate*. In particular, it does not affect the information service quality in a significant way.

Hypothesis 3 – Efforts Spent

In models 5 to 8 we analyze the impact of investment in human capital and insurance related knowledge and skills as well as of the time spent for different activities as proxies to explain differences in service quality between intermediaries. Since independent intermediaries distribute information of products from more insurance companies than exclusive agents, we include the *intermediary type* to control for the resulting differences in search efforts.

According to our estimation results neither *formal educational levels*, *additional training*²² nor *work experience* have any explanatory power in regard to the different quality indicators used. Thus, it makes no sense for consumers to use these as signals for the information and service quality of an intermediary. *Age* shows a significantly negative impact on the number of additional services provided (model 6). This might account for the fact that providing additional services requires additional investment in the knowledge and skills. Following human capital theory one

²² Only in regard to the contract conclusion rate we find that intermediaries with additional training do perform poorer, see equ.8.

can argue that the readiness to incur such investment decreases with age, since the older an intermediary is, the more dubious it becomes whether she will be able to realize the gains from such an investment in her remaining working life. Besides, model 8 shows that the *contract conclusion rate* is also negatively affected by an intermediary's age. This might result from the fact that new business becomes less important the older an intermediary is, since she derives her main income from long-term customers. While *further trainings* have a significantly positive effect on the services provided (models 5 to 7), this does not pay in terms of contracts concluded. Quite to the contrary we find a significantly negative impact on the *contract conclusion rate* (model 8). However, one should be cautious in interpreting this in a causal way, since it also seems plausible that the lower the contract conclusion rate, the more further trainings an intermediary attends – hoping to learn about how to become more successful.

When using the *information index* as the dependent variable, in models 5 and 9 the coefficient estimates for the percentage of time spent on *counseling interviews*, *further training* and *claims settlement* are significantly positive. These results are consistent with hypothesis 3 that more efforts spent on activities which are related to the production of information services increase their quality. Obviously, insurance intermediaries gain specific knowledge about what topics and what information is relevant for consumers mainly through investment in further trainings and by claims settlement. These two activities exhibit large fixed costs. Besides, information about claims settlement is highly specific. It entails consumer-specific information about the likelihood of damage and insurance company-specific information about the consequences of specific contract terms for claims settlement as well as insurance companies' handling in case of loss. Thus, these results also support the hypothesis that intermediated search has advantages which cannot be attained through personal search by consumers. For a single consumer neither the high costs of attending insurance intermediaries' further trainings would pay off nor does she have the opportunity to acquire the activity-specific knowledge resulting from claims settlement. But although claims settlement activities improve the service quality provided, they do not pay off for intermediaries in terms of economic success. Time spent on claims settlement has a negative, and in model 12 also significant impact on the *contract conclusion rate*. Besides, the coefficient estimate for the percentage of time spent on *sales efforts* shows a significantly negative impact on the *contract conclusion rate* both in models 8 and 12. This implies that more sales efforts are primarily incurred when contract conclusion rates are low, that is when economic success is poor.

The coefficient estimate for the absolute time spent on counseling interviews (*duration_interviews*) shows a significantly positive impact across all service quality indicators in models 5 to 12 with the exception of the additional services offered (models 6 and 10). Time spent for counseling thus enhances both the information quality provided as well as the total service quality supplied and finally also results in a higher percentage of contracts concluded by an insurance intermediary.

Summarizing, our evidence does not confirm hypothesis 3, this holds while even controlling for insurance intermediary type. Our data show that it does neither makes sense for consumers to use formal educational levels or training certificates as a signal for high service quality, nor does it pay for intermediaries to invest more in human capital, at least not when the contract conclusion rate is used as a proxy for economic success. However, specific activities like claims settlement and further training show a positive impact. Not surprisingly, time spent for counseling interviews proves to be statistically significant for information and services quality. It also pays for intermediaries, since it increases their market performance as measured in the *contract conclusion rate*.

Hypothesis 4 – Informational Input

Finally, hypothesis 4 analyzes what impact informational input has on the quality of the intermediation services provided. While models 5, 7, 9 and 11 estimate the effect of different information sources and consumers' cooperation, models 6, 8, 10 and 12 also account for the informational content provided in counseling interviews.²³

The estimation results for models 5 and 9 indicate that intermediaries, who rely strongly on *rating agencies*, the *science* and *specialist publications* as sources of credible information, provide significantly higher information quality as well as total service quality. In regard to information quality also a high reliance on *consumers' associations* as a credible source of information shows a significantly positive impact. In comparison, estimation results suggest that the more important *further trainings* are as a source of gathering information for intermediaries, the lower the information and total service quality provided is. This indicates that information, knowledge and skills as circulated in further trainings is not conducive to increasing information

²³ Since these variables enter the *information index* and the *total service index*, we omit them in the models using these variables as dependent.

quality (models 5 and 9), which also shows in its negative effect on total service quality in models 7 and 11. This also leads to poor economic performance as measured by the *contract conclusion rate* (model 8).

Furthermore, our data reveals a significantly positive impact of the *information content* provided on the number of additional services provided, if an intermediary puts higher weight on informing customers on *general aspects* and on their *personal risk profile and security options*. The coefficient estimates in models 8 and 12 show a significantly positive effect on the contract conclusion rate, the more weight an intermediary puts on informing his customers on their *personal risk profile and security options* and on the *calculation of participation rates* of life insurance products. In contrast to that, providing information about *policy design, contract design* and *contract execution* shows no significant impact across all models. Despite their alleged importance for the quality of the insurance purchase transaction, consumers seem not to honor it (as there is no significant impact on the *contract conclusion rate*).

The service quality provided by an insurance intermediary is in part the outcome of an interactive process between the intermediary and the customer, since it also depends on the revelation of privately held information by the consumer. Accordingly, we hypothesized that the better the cooperation between intermediary and consumer works, the higher the service quality should be. To account for this, we employ consumers' knowledge about different insurance relevant matters as well as their demand for information provision and additional services as proxies. The higher their knowledge resp. demand is, the better the overall outcome should be. For the *information index* (model 5) and for the *service index* (model 7) our estimations show significantly positive coefficient estimates for *consumers' knowledge about their risk profile*. These findings suggest that intermediaries provide only additional information and thus higher information quality, if their customers already have a high level of knowledge about their risk profile, but a low level of knowledge about protection for old-age security. There are two possible answers to this finding. On the one hand, this is the expected result, since half of the items summarized in the dependent variable *information index* concern old-age protection. It is unnecessary for an intermediary to put much weight on such topics, if his customers already have a high level of knowledge about them. On the other hand, insurance intermediaries rely strongly on income from selling life insurance policies and other products concerning old-age security. Accordingly, they should have an interest in increasing consumers' knowledge about exactly such insurance products. This is in

line with the finding that insurance intermediaries do not provide significantly more information to customers with low knowledge on the disadvantages of insurance products compared to other financial assets which can be used as substitutes. In regard to additional services and to the contract conclusion rate consumers' knowledge seems to play no role, since we find no statistically relevant influence. To summarize, consumers cannot expect intermediaries to automatically provide additional information in case they have only limited knowledge. This supports the statement of principal agent theory according to which under information asymmetries only low service quality should result.

Although the cooperation between insurance intermediaries and their customers affects the quality of the advice given, consumers might nevertheless differ in their willingness to participate in the counseling process. To account for such differences among consumers, we use *consumers' demand for information provision* and *consumers' demand for additional services for free* as proxies. Models 5 and 6 confirm our findings already stated in regard to hypothesis 2. Obviously, consumer's can induce insurance intermediaries to provide better information and service quality by communicating a higher demand for it. However, it does not increase the *contract conclusion rate*.

All in all, our evidence shows some support for the findings of transaction costs, search and principal agent theory as stated in hypothesis 4 according to which the service quality provided positively depends on the underlying informational input and on cooperation between the intermediary and her customer. However, there seems to be a conflict for intermediaries between economic success as measured by the *contract conclusion rate* and providing detailed information about relevant contractual aspects of insurance coverage. Together with the profound information asymmetries between intermediaries and consumers it, thus, follows that that for rational intermediaries high quality information services will not come first.

Discussion

To see the effect of combining our hypotheses, we estimate models 9 to 12 (*Table 2* below). They show that our findings from models 1 to 8 are quite robust (see discussion above). In addition the explanatory power of our estimations clearly improves, when including variables that account for the efforts spent and the informational inputs used in providing intermediation services. The adjusted Rsquares of all four service variable proxies increase from models 1 to 4 to models 9 to 12 by between 6% and 12%. This clearly indicates that service quality depends not only on

whether intermediaries are more or less (in-)dependent from insurance companies. There are additional differences in the service quality provided by intermediaries which cannot be explained by them being either exclusive agents or insurance brokers, but by the information gathering and processing activities they perform.

[Table 2 about here]

For analyzing how sensitive our findings are with respect to the functional forms applied, we carried out a number of logit and double-log estimations.²⁴ Their results confirm the main findings from above. Besides, we performed a number of stability tests. They also show no indication that omitted variables or incorrect functional form create bias in the coefficient estimates. In addition, we performed post-hoc statistical power tests which provide no evidence that our regressions suffer from low statistical power.²⁵

5. Conclusions

Quite in accordance with the empirical literature our estimations also provide no uniform evidence on the product quality hypothesis. According to our findings, independent agents and insurance brokers provide better service quality when information services and their contract conclusion rates are used as proxies, while exclusive agents provide significantly more additional services. When taken together, then, there are no significant differences to be found between these various distribution channels in regard to the total service quality provided.

Also in regard 1 to hypothesis 2 on specialization and economies of scale, our findings are not uniform. Increasing firm size enables insurance intermediaries to realize economies of scale only in regard to the provision of additional services. Our data do not give evidence that firm size matters in regard to information quality, total service quality or the contract conclusion rate. Accordingly, acquiring and processing information about topics relevant for concluding an insurance contract seem to exhibit divisibility among members of the same agency. This is in line

²⁴ Since these estimations provide no additional explanatory power, we omitted them in the reported estimations below. Regression results can be obtained from the authors upon request.

²⁵ According to Cohen (1988) a test has sufficient power given a power value of at least 0.8. The power values are reported in *Tables 1* and *2*.

with findings of Cummins (1977) that there are no scale economies for independent insurance agents. Besides, according to our findings there are also no economies of scale to be realized by specializing on an insurance company and its products or on a certain insurance line. However, there is some evidence that economies of scale can be realized by specializing on customer segments. Besides, in accordance with hypothesis 2 we found clear evidence that economies of scope can be realized by offering additional services.

As concerns the efforts spent by insurance intermediaries, we find that the duration of counseling interviews is the single most important factor that has a positive effect both on the information quality and on the total service quality provided, while it simultaneously also pays for intermediaries as it increases their contract conclusion rate. In contrast to that, we find no evidence that different educational levels or additional trainings show a significant impact. Thus, such certificates should not be used by consumers as indicators of high service quality. Moreover, our data give some support for findings derived from transaction costs, search and principal agent theory that the service quality provided is positively affected by the informational inputs used. Finally, we find that despite the profound information asymmetries between insurance intermediaries and their customers, consumers' demand for information and additional services indeed results in better service quality. Thus, more demanding consumers should expect intermediaries to provide better counseling and advisory services.

All in all, we thus find that the service quality of insurance intermediaries does not only depend on whether they are exclusive agents or insurance brokers. There are also quality differences that cannot be accounted for by the distribution channel and its characteristics to which an intermediary belongs. According to our findings, the quality of the services provided depends also to a large extent on their information gathering and processing activities of the individual intermediaries. Because of the important role insurance intermediaries play in insurance markets in reducing information asymmetries between consumers and insurance companies, additional research should be undertaken to better understand how high service quality is produced. Thus, research efforts should concentrate not only on explaining the coexistence of different distribution systems, but also on explaining differences in service quality within a particular distribution channel. Besides, further efforts are necessary to find better proxies to account for insurance intermediaries' service quality. One main limitation of our data is that they do not allow us to make any statements about the informational content actually provided by an

intermediary to his customers. To get such data, for example a combination of mystery shopping interviews with a follow-up survey on the information processing activities of the interviewed intermediaries could be performed.

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Table 1: Regression Results^a Dependent variable: $\log(\text{contract conclusion rate}/(1-\text{contract conclusion rate}))$

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
	N = 776	N = 785	N = 783	N = 701	N = 647	N = 600	N = 647	N = 553
Dependent Variables	Information Index	Additional Services	Service Index	Contract conclusion rate ^a	Information Index	Additional Services	Service Index	Contract conclusion rate ^a
Constant	2.730*** (15.14)	6.113*** (9.81)	9.741*** (23.62)	1.200*** (3.23)	1.136*** (2.12)	11,175*** (4.26)	7.847*** (5.53)	5.224*** (3.76)
Independent Variables								
Intermediary type								
Exclusive agent	-0.278*** (-4.54)	0.943*** (3.28)	-0.156 (-0.79)	-0.337** (-1.94)	-0.171*** (-3.82)	0.811*** (3.39)	0.035 (0.26)	-0.574*** (-4.30)
Firm size								
Small (1 to 3 employees)	0.061 (1.48)	-0.729*** (-4.05)	-0.053 (-0.44)	0.119 (1.31)				
Large (more than 9 employees)	-0.076 (-1.13)	0.111 (0.31)	-0.038 (-0.17)	0.158 (0.91)				
Specialization								
Insurance company	-0.007 (-0.13)	-0.273 (-0.96)	-0.114 (-0.59)	-0.205 (-1.18)				
Insurance company reputation	0.063*** (3.28)	-0.280*** (-3.27)	-0.005 (-0.08)	0.016 (0.38)				
Insurance line	-0.019 (-0.50)	0.807*** (4.85)	0.242** (2.28)	-0.070 (-0.80)				
Customer Segment	0.074** (1.97)	0.181 (1.09)	0.258** (2.35)	0.011 (0.13)				
Additional Services	0.154*** (3.28)			0.326*** (2.81)				
Competitive pressure	-0.007 (-0.35)	-0.156* (-1.86)	-0.054 (-0.95)	-0.320*** (-7.19)				

Table 1: Regression Results (cont.)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
<i>Customers' knowledge</i>								
Risk profile	0.035 (1.32)	0.025 (0.21)	0.104 (1.33)	0.037 (0.57)	0.069*** (2.52)	0.076 (0.57)	0.208*** (2.56)	0.013 (0.17)
Old-age protection provisions	-0.024 (-0.84)	0.061 (0.48)	-0.051 (-0.62)	0.099 (1.49)	-0.067** (-2.11)	0.199 (1.40)	-0.139* (-1.62)	0.097 (1.21)
(Dis-) Advantages of insurance products	0.027 (1.08)	-0.281** (-2.34)	-0.075 (-0.99)	-0.114** (-1.98)	0.027 (0.96)	-0.231* (-1.64)	-0.063 (-0.82)	-0.073 (-1.03)
<i>Customers' demand</i>								
Information provision	0.070** (2.26)	0.154 (1.26)	0.183** (2.32)	0.005 (0.09)	0.064** (1.99)	-0.229* (-1.62)	0.065 (0.77)	-0.060 (-0.76)
Additional services for free	0.106*** (4.51)	0.160* (1.59)	0.261*** (4.08)	0.008 (0.17)	0.070*** (2.82)	0.199** (1.84)	0.209*** (3.18)	-0.028 (-0.48)
<i>Age</i>					0.179 (1.29)	-1.977*** (-3.02)	-0.479 (-1.20)	-1.179*** (-3.07)
<i>Formal education</i>								
Lower secondary school					0.094 (1.21)	0.149 (0.44)	0.245 (1.18)	-0.078 (-0.43)
Intermediate leaving certificate					0.050 (1.00)	0.109 (0.43)	0.152 (1.06)	0.070 (0.55)
Certificate of aptitude for specialized short course in higher education					0.028 (0.53)	-0.177 (-0.63)	0.029 (0.18)	0.191 (1.36)
(Additional) Training					0.019 (0.29)	0.239 (0.74)	0.046 (0.24)	-0.308** (-1.82)
University degree					-0.032 (-0.63)	0.274 (1.07)	0.003 (0.02)	-0.076 (-0.55)
Work experience					-0.032 (-0.63)	0.241 (0.95)	0.019 (0.13)	0.190 (1.26)
Further training_number					-0.002 (-0.05)	0.341** (2.40)	0.067 (0.78)	-0.136** (-1.90)
<i>Time budget</i>								
Information acquisition and processing					-0.017 (-0.11)	-0.520 (-0.67)	-0.552 (-1.17)	-0.262 (-0.57)
Counseling interviews					0.225** (1.86)	0.141 (0.22)	0.235 (0.65)	0.300 (0.88)

Table 1: Regression Results (cont.)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Further training					0.068** (2.28)	1.499 (1.01)	2.054** (2.33)	-0.094 (-0.13)
Claims settlement					0.649*** (2.63)	-0.382 (-0.30)	0.572 (0.78)	-0.247 (-0.36)
Sales efforts					-0.186 (-0.52)	-0.594 (-0.36)	0.003 (0.00)	-3.730*** (-364)
Duration_interviews					0.105*** (3.16)	0.170 (0.94)	0.377*** (3.83)	0.231*** (2.63)
<i>Information source</i>								
Insurance companies					0.028 (0.86)	-0.124 (-0.76)	0.064 (0.78)	0.047 (0.54)
Professional associations					0.018 (0.54)	0.251 (1.45)	0.105 (1.10)	-0.057 (-0.61)
Rating agencies					0.064** (2.17)	0.120 (0.90)	0.305*** (3.70)	0.065 (0.92)
Consumers' associations					0.050** (2.02)	0.060 (0.48)	0.057 (0.76)	0.083 (1.25)
Science					0.093*** (3.13)	0.203 (1.43)	0.228*** (2.70)	-0.060 (-0.86)
Specialist publications					0.157*** (2.99)	-0.154 (-0.67)	0.345*** (2.62)	0.101 (-0.90)
General media					-0.040 (-1.43)	-0.145 (-0.10)	-0.093 (-1.29)	-0.006 (-0.08)
Source_further training					-0.079* (-1.72)	0.258 (-1.23)	-0.281** (-2.26)	-0.219** (-1.96)
<i>Information content</i>								
General Aspects						0.378*** (3.68)		0.025 (0.48)
Calculation of participation rates						0.107 (1.09)		0.110** (2.18)
Contract design						-0.075 (-0.72)		-0.042 (-0.84)
Personal risk profile and security options						0.336*** (3.02)		0.155*** (2.94)

Table 1: Regression Results (cont.)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Policy design						-0.030		0.002
						(-0.28)		(0.04)
Private old-age insurance products						-0.076		0.043
						(-0.74)		(0.83)
Contract Execution						-0.033		0.023
						(-0.35)		(0.47)
Rsquare	0.149	0.097	0.064	0.172	0.229	0.172	0.183	0.197
Adj. Rsquare	0.133	0.082	0.048	0.155	0.194	0.121	0.146	0.142
F-Test	10.46***	0.096**	3.49***	9.48***	7.30***	3.29***	4.79***	4.30***
Power test ($\alpha=0.001$)	1.000	1.000	0.847	1.000	1.000	1.000	1.000	1.000

*** significant at the 1%- level, ** significant at the 5% level, * significant at the 10% level

t-values in parentheses

Table 2: Regression Results^a Dependent variable: $\log(\text{contract conclusion rate}/(1-\text{contract conclusion rate}))$

	Model 9 OLS	Model 10 OLS	Model 11 OLS	Model 12 OLS
	N = 574	N = 543	N = 579	N = 495
Dependent Variables	Information Index	Additional Services	Service Index	Contract conclusion rate ^a
Constant	1.332** (2.20)	10.873*** (3.98)	8.696*** (5.69)	4.614*** (3.10)
Independent Variables				
<i>Intermediary type</i>				
Exclusive agent	-0.253*** (-3.37)	0.996*** (2.93)	-0.085 (-0.37)	-0.447** (-2.19)
<i>Firm size</i>				
Small (1 to 3 employees)	0.002 (0.04)	-0.761*** (-3.67)	-0.191 (-1.44)	0.093 (0.88)
Large (more than 9 employees)	-0.111* (-1.57)	0.073 (0.18)	-0.262 (-1.04)	0.209 (1.06)
<i>Specialization</i>				
Insurance company	0.022 (0.31)	0.159 (-0.51)	0.055 (0.25)	-0.089 (-0.48)
Insurance company reputation	0.041** (1.95)	-0.271*** (-2.62)	-0.034 (-0.57)	0.010 (0.21)
Insurance line	-0.001 (-0.00)	0.511*** (2.76)	0.135 (1.12)	-0.013 (-0.14)
Customer Segment	0.060 (1.44)	-0.104 (-0.54)	0.140 (1.15)	-0.032 (-0.33)
Additional Services	0.147** (2.54)			0.234** (1.81)
<i>Competitive pressure</i>	0.007 (0.31)	-0.116 (-1.15)	0.008 (0.13)	-0.314*** (-5.66)
<i>Customers' knowledge</i>				
Risk profile	0.058** (1.96)	0.017 (0.13)	0.178** (2.00)	0.039 (0.50)
Old-age protection provisions	-0.065** (-1.95)	0.235* (1.16)	-0.134 (-1.46)	0.041 (0.49)
(Dis-) Advantages of insurance products	0.023 (0.79)	-0.288** (-1.98)	-0.094 (-1.13)	-0.096 (-1.30)
<i>Customers' demand</i>				
Information provision	0.078** (2.43)	-0.260** (-1.79)	0.053 (0.58)	-0.026 (-0.33)
Additional services for free	0.061** (2.40)	0.215** (1.88)	0.221*** (3.09)	-0.023 (-0.38)
<i>Age</i>	0.080 (0.52)	-1.433** (-2.04)	-0.696* (-1.63)	-0.867** (-2.22)
<i>Formal education</i>				
Lower secondary school	0.088 (1.05)	0.163 (0.46)	-0.199 (0.90)	-0.013 (-0.08)
Intermediate leaving certificate	0.023 (0.42)	-0.065 (-0.25)	0.050 (0.33)	0.069 (0.53)
Certificate of aptitude for specialized short course in higher education	0.042 (0.73)	-0.311 (-1.07)	-0.045 (-0.26)	0.227 (1.59)

Table 2: Regression Results (cont.)

	Model 9	Model 10	Model 11	Model 12
	OLS	OLS	OLS	OLS
(Additional) Training	0.018 (0.26)	0.072 (0.22)	-0.041 (-0.20)	-0.199 (-1.10)
University degree	-0.009 (-0.18)	0.240 (0.90)	0.065 (0.39)	-0.086 (-0.61)
Work experience	-0.013 (-0.23)	0.062 (0.23)	0.025 (0.16)	0.167 (1.12)
Further training_number	-0.034 (-1.04)	0.452*** (3.14)	0.047 (0.50)	-0.120 (-1.55)
<i>Time budget</i>				
Information acquisition and processing	0.013 (0.08)	-0.545 (-0.65)	-0.726 (-1.38)	-0.797* (-1.78)
Counseling interviews	0.259** (1.90)	-0.342 (-0.53)	0.444 (1.12)	0.210 (0.62)
Further training	0.614** (1.92)	2.434 (1.54)	2.375** (2.43)	0.209 (0.29)
Claims settlement	0.512** (1.93)	-0.483 (-0.36)	0.360 (0.47)	-1.325** (-2.01)
Sales efforts	-0.284 (-0.70)	1.149 (0.65)	0.315 (0.30)	-2.199** (-2.13)
Duration_interviews	0.077** (2.18)	0.152 (0.81)	0.378*** (3.46)	0.235** (2.56)
<i>Information source</i>				
Insurance companies	0.027 (0.76)	-0.044 (-0.25)	0.109 (0.99)	0.095 (1.09)
Professional associations	0.038 (1.04)	0.211 (1.18)	0.129 (1.25)	-0.148 (-1.56)
Rating agencies	0.046 (1.46)	0.094 (0.68)	0.253*** (2.75)	0.043 (0.60)
Consumers' associations	0.044** (1.76)	0.121 (0.95)	0.101 (1.31)	0.062 (0.99)
Science	0.092*** (2.84)	0.166 (1.15)	0.231** (2.50)	-0.046 (-0.66)
Specialist publications	0.152*** (2.79)	-0.312 (-1.36)	0.350** (2.43)	-0.086 (-0.73)
General media	-0.027 (-0.99)	-0.077 (-0.58)	-0.075 (-0.93)	0.010 (0.13)
Source_further training	-0.076* (-1.59)	-0.211 (-0.97)	-0.276** (-2.08)	-0.096 (-0.86)
<i>Information content</i>				
General Aspects		0.302*** (2.85)		0.025 (0.46)
Calculation of participation rates		0.098 (1.01)		0.031 (0.64)
Contract design		0.023 (0.23)		-0.052 (-0.99)
Personal risk profile and security options		0.346*** (3.19)		0.226*** (4.05)
Policy design		-0.047 (-0.42)		-0.012 (-0.21)
Private old-age insurance products		-0.025 (-0.24)		0.086* (1.61)

Table 2: Regression Results (cont.)

	Model 9	Model 10	Model 11	Model 12
	OLS	OLS	OLS	OLS
Contract Execution		0.014 (0.15)		0.052 (1.03)
Rsquare	0.252	0.228	0.195	0.282
Adj. Rsquare	0.202	0.163	0.143	0.214
F-Test	5.86***	3.86***	3.84***	4.84***
Power test ($\alpha=0.001$)	1.000	1.000	1.000	1.000

Appendix

Table A.1: Hypotheses

Hypotheses	Independent Variable	Expected Sign of Coefficient Estimates
<p>H 1: Product Quality Hypothesis</p> <p>Independent intermediaries provide better service quality.</p>	<p><i>exclusive agent</i></p> <p><i>insurance company reputation</i></p> <p><i>consumers' knowledge</i></p>	<p>-</p> <p>+</p> <p>+</p>
<p>H 2: Specialization, Economies of Scale and Scope</p> <p>Specialization and economies of scale and scope lead to better service quality.</p>	<p><i>firm size</i></p> <p><i>insurance company</i></p> <p><i>insurance line</i></p> <p><i>customer segment</i></p> <p><i>additional services</i></p>	<p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p>
<p>H 3: Efforts spend</p> <p>The more an intermediary invests in general and insurance-specific human capital (knowledge and skills) and the more time an intermediary spends on information processing and counseling interviews, the better the service quality provided.</p>	<p><i>formal education</i></p> <p><i>(additional) training</i></p> <p><i>university degree</i></p> <p><i>work experience</i></p> <p><i>further training</i></p> <p>time budget:</p> <p><i>information processing</i></p> <p><i>counselling interviews</i></p> <p><i>further training</i></p> <p><i>claims settlement</i></p> <p><i>sales efforts</i></p> <p><i>duration_interviews</i></p>	<p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>+</p> <p>?</p> <p>+</p>
<p>H 4: Informational Input</p> <p>The better the information sources used by an intermediary are, the more information about relevant subjects an intermediary provides in counseling interviews and the more consumers' cooperate, the better is the service quality provided.</p>	<p><i>information source</i></p> <p><i>information content</i></p> <p><i>customers' knowledge</i></p> <p><i>customers' demand</i></p>	<p>+</p> <p>+</p> <p>+</p> <p>+</p>

Table A.2: Definition and Measurement of Variables

	Variable	Explanation and Measurement
Dependent Variables		
	Information index	Continuous variable measuring the mean value of 27 items ²⁶ about the importance attached to different aspects in counseling interviews by the intermediary ranging from <i>1 = very low quality ... 5 = very high quality</i>
	Additional services	Continuous variable measuring the number of additional services provided
	Service index	Continuous variable measuring the total services quality. It is the additive aggregation of the normalized variables <i>information index</i> and <i>additional services</i> , with the <i>information index</i> entering with double weight.
	Contract conclusion rate	Continuous variable measuring the proportion of the average number of counseling interviews on all interviews that lead to contract conclusion
Independent Variables		
Distribution Channel Variable	Intermediary type	Set of dummy variables with <i>1 = intermediary type</i> , <i>0 = other</i> : exclusive agent; independent intermediary reference class: independent intermediary
Specialization Variables	Firm size	Dummy variable measuring the size of an intermediary's firm with <i>1 = yes</i> , <i>0 = no</i> Small (1-3 employees), medium (4-9 employees), large (10-30 employees) reference class: medium (4-9 employees)
	Insurance company	Dummy variable on specialization on a certain insurance company and its products with <i>1 = yes</i> , <i>0 = no</i>
	Insurance company reputation	Continuous variable measuring the factor score extracted by a factor analyses which indicate how much weight intermediaries attach to the quality of the insurance company and the quality of the products they distribute for gaining reputation
	Insurance line	Dummy variable on specialization in old-age insurance products with <i>1 = yes</i> , <i>0 = no</i>
	Customer segment	Dummy variable on specialization on customer segments with <i>1 = yes</i> , <i>0 = no</i>

²⁶ For the single items see *Table A.4* below.

Table A.2: Definition and Measurement of Variables (cont.)

	Variable	Explanation and Measurement
Human Capital Variables	Age	Continuous variable measuring the age of the interviewed intermediary in years
	Formal education	Set of dummy variables with $1 = \text{highest degree of formal education}$, $0 = \text{other}$: lower secondary school; intermediate leaving certificate; certificate of aptitude for specialized short-course higher education; general certificate of aptitude for higher education reference class: general certificate of aptitude for higher education
	(Additional) Training	Dummy variable with $1 = (\text{additional}) \text{ training}$, $0 = \text{none}$
	University degree	Dummy variable with $1 = \text{university degree}$, $0 = \text{none}$
	Work experience	Continuous variable measuring work experience in years
	Further training_number	Continuous variable measuring the number of further training courses, conferences etc. frequented during the last 12 months
Information Production Variables	Time budget	5 continuous variables measuring the share of the time spent for a certain activity on the total time budget: information acquisition and processing; counseling interviews; further training; claims settlement; sales efforts
	Duration_interviews	Continuous variable measuring the average duration of general counseling interviews in minutes
	Information source	7 continuous variables measuring the importance of an information source used by an intermediary with its attached objectivity on a 25-point rating scale with $1 = \text{very subjective and not at all important source}$... $25 = \text{very credible and very important source}$: insurance companies; professional associations; rating agencies; consumers' associations; science; specialist publications; general media
	Source_further training	Ordinal variable measuring the importance attached to further training as an information source measured on a five-point Likert scale with $1 = \text{not at all important}$... $5 = \text{very important}$
	Information content	7 continuous variables measuring the factor scores extracted by a factor analysis from 27 items which indicate the importance attached to different aspects in counseling interviews by the intermediary: ²⁷ old-age security in general; calculation of participation rates; contract design; personal risk profile and needs; policy design; private old-age insurance products; contract execution
	Additional services	Continuous variable measuring the number of additional services provided

²⁷ For more details see *Tables A.4* and *A.5* below.

Table A.2: Definition and Measurement of Variables (cont.)

	Variable	Explanation and Measurement
Customer Variables	Customers' knowledge	3 ordinal variables indicating customers' knowledge on a five-point Likert scale with <i>1 = very bad knowledge ... 5 = very good knowledge</i> : risk profile; old-age protection provisions; (dis-)advantages of insurance products
	Customers' demand	2 ordinal variables measuring consumers' demand on a five-point Likert scale with <i>1 = more modest ... 5 = more demanding</i> about: information services; additional services for free
Market Variable	Competitive pressure	Ordinary variable measuring the extent of competitive pressure on a five-point Likert scale with <i>1 = none ... 5 = very strong</i>

Table A.3: Descriptive Statistics

Dependent Variables	Min	Max	Mean	Median	StandDev	N
Information Index	1.407	5.000	3.716	3.703	0.531	917
Information Index Dummy	0.000	1.000	0.523	1.000	0.499	938
Contract Conclusion Rate	-2.944	4.595	0.743	0.847	1.195	830
Additional Services	0.000	15.000	6.650	7.000	2.333	927
Service Index	6.000	15.000	11.330	11.000	1.484	912
Independent Variables						
<i>Intermediary type</i>						
Exclusive agent	0.000	1.000	0.452	0.000	0.497	933
<i>Firm size</i>						
Small (1 to 3 employees)	0.000	1.000	0.642	1.000	0.479	910
Medium (3 to 9 employees)	0.000	1.000	0.280	0.000	0.449	910
Large (more then 9 employees)	0.000	1.000	0.076	0.000	0.266	910
<i>Specialization</i>						
Insurance company	0.000	1.000	0.605	1.000	0.489	915
Insurance company reputation	-3.838	2.783	0.000	0.076	1.000	864
Insurance line	0.000	1.000	0.384	0.000	0.486	938
Customer Segment	0.000	1.000	0.567	1.000	0.496	938
<i>Age</i>	20.000	64.000	43.102	42.000	8.966	929
<i>Formal education</i>						
Lower secondary school	0.000	1.000	0.118	0.000	0.323	935
Intermediate leaving certificate	0.000	1.000	0.376	0.000	0.484	935
Certificate of aptitude for specialized short-course in higher education	0.000	1.000	0.186	0.000	0.389	935
(Additional) Training	0.000	1.000	0.915	1.000	0.278	933
University degree	0.000	1.000	0.266	0.000	0.442	905
Work experience	1.000	48.000	16.059	14.000	8.324	928
Further training_number						
<i>Time budget</i>						
Information acquisition and processing	0.000	0.700	0.212	0.200	0.124	866
Counseling interviews	0.000	0.900	0.368	0.350	0.157	867
Further training	0.000	0.500	0.115	0.100	0.066	867
Claims settlement	0.000	0.500	0.111	0.100	0.076	866
Sales efforts	0.000	0.700	0.061	0.050	0.057	867
Duration_interviews	10.000	180.000	56.710	60.000	31.314	884
<i>Information source</i>						
Insurance companies	1.000	25.000	11.064	10.000	5.745	906
Professional associations	1.000	25.000	12.090	12.000	5.735	866
Rating agencies	1.000	25.000	11.295	12.000	6.257	861
Consumers' associations	1.000	25.000	8.109	8.000	5.412	861
Science	1.000	25.000	9.244	9.000	5.534	821
Specialist publications	1.000	25.000	13.830	13.500	5.489	896
General media	1.000	25.000	6.668	6.000	4.485	873
Source_further training	1.000	5.000	2.340	2.000	1.095	898
<i>Information content</i>						
General aspects	-4.126	2.489	0.000	0.105	1.000	828
Calculation of participation rates	-3.543	2.853	0.000	0.092	1.000	828
Contract design	-2.811	4.293	0.000	0.043	1.000	828

Table A.3: Descriptive Statistics (cont.)

Independent Variables	Min	Max	Mean	Median	StandDev	N
Personal risk profile and security options	-5.875	2.804	0.000	0.089	1.000	828
Policy design	-3.706	2.305	0.000	0.036	1.000	828
Private old-age insurance products	-3.274	2.120	0.000	0.122	1.000	828
Contract execution	-3.272	3.013	0.000	0.094	1.000	828
<i>Customers' demand</i>						
Information provision	1.000	5.000	4.008	4.000	0.751	918
Additional services for free	1.000	5.000	3.753	4.000	0.928	916
<i>Customers' knowledge</i>						
Risk profile	1.000	5.000	2.647	3.000	0.763	921
Old-age protection provisions	1.000	5.000	2.749	3.000	0.747	919
(Dis-) Advantages of insurance products	1.000	5.000	2.326	2.000	0.862	920
<i>Competitive pressure</i>						
	1.000	5.000	3.326	3.000	1.005	893

Table A.4: Factor Analysis *Information Content* – Rotated Component Matrix

Variables	Components						
	1 <i>General Aspects</i>	2 <i>Calculation of Participation Rates</i>	3 <i>Contract Design</i>	4 <i>Personal Risk Profile and Security Options</i>	5 <i>Policy Design</i>	6 <i>Private Old-age Insurance Products</i>	7 <i>Contract Execution</i>
Tax advantages	.809						
Occupational pension schemes vs. private old-age insurance	.708						
Taxation and social policy regulation	.686						
Performance of insurance companies	.525						
Investment funds	.499						
Disadvantages of zillmering	.417						
Surplus and interest rate changes		.782					
Non commitment		.709					
Guaranteed performance		.702					
Surplus determinants		.619					
Past effective surplus		.615					
Termination options			.845				
Contract period			.789				
Procedures of contract modification			.658				
Costs of contract modification			.585				
Type and coverage of the insured risks				.725			
Individual security gaps				.695			
Insurance and product types				.609			
(Dis-) advantages of different security options				.533			
Premium design					.778		
Price-performance tests					.762		
Cost components					.593		
Capital sum life insurance vs. <i>Riester</i> policy						.776	
Cost calculation by change of policy						.774	
Specific rest life insurance vs. capital sum life insurance						.606	
Claim settlement							.710
Conflict settlement							.602

Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser-normalization.

Table A.5: Factor Analysis *Information Content* – Sampling Adequacy and Total Variance Explained

Measure of sampling adequacy by the Kaiser-Meyer-Olkin (KMO) statistics 0.889

Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.658	28.361	28.361	7.658	28.361	28.361	2.876	10.654	10.654
2	1.884	6.976	35.337	1.884	6.976	35.337	2.758	10.215	20.868
3	1.754	6.496	41.834	1.754	6.496	41.834	2.652	9.823	30.691
4	1.513	5.605	47.439	1.513	5.605	47.439	2.374	8.792	39.483
5	1.415	5.242	52.681	1.415	5.242	52.681	2.209	8.181	47.664
6	1.252	4.638	57.319	1.252	4.638	57.319	2.004	7.421	55.085
7	1.076	3.985	61.304	1.076	3.985	61.304	1.679	6.219	61.304
8	.795	2.944	64.248						
9	.781	2.891	67.139						
10	.754	2.791	69.930						
11	.729	2.702	72.632						
12	.697	2.580	75.212						
13	.648	2.399	77.611						
14	.620	2.297	79.909						
15	.573	2.121	82.029						
16	.549	2.034	84.064						
17	.505	1.870	85.934						
18	.491	1.817	87.751						
19	.459	1.700	89.451						
20	.430	1.593	91.044						
21	.420	1.558	92.601						
22	.397	1.470	94.072						
23	.373	1.370	95.451						
24	.350	1.298	96.749						
25	.319	1.180	97.930						
26	.301	1.116	99.046						
27	.258	.954	100.000						

Extraction Method: Principal Component Analysis.

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