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Uwe Focht, Andreas Richter, Jörg Schiller

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Uwe Focht¹, Andreas Richter², Jörg Schiller³

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¹ Research Assistant, Institute for Risk and Insurance, University of Hamburg, Germany, phone: +49 40 428384016, fax: +49 40 428385505, email: focht@econ.uni-hamburg.de.

² Chair in Risk & Insurance, Ludwig-Maximilians University Munich, Germany, phone: +49 89 21803755, fax: +49 89 2180993755, email: richter@bwl.uni-muenchen.de.

³ Assistant Professor of Organization Theory, WHU – Otto Beisheim School of Management, Vallendar, Germany, phone: +49 261 6509302, fax: +49 261 6509509, email: joerg.schiller@whu.de.

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Abstract

Recent events involving major insurance companies and insurance brokerage firms highlight substantial incentive problems in commercial and reinsurance markets where intermediation takes place. We show that in markets with informed as well as uninformed consumers and heterogeneous risk profiles intermediation has the potential to improve social welfare. However, since intermediation reduces insurers' market power, incentives for tacit collusion are higher compared to markets without intermediation. A controversial matter in the discussion concerning insurance intermediation is the issue of compensation customs. Our analysis provides explanations for the counterintuitive observation that brokers are usually compensated by insurance companies. The rationale for the latter is the fact that a fee paid by uninformed consumers limits the insurers' ability to extract rents from informed consumers.

Keywords: insurance, brokerage, collusion, compensation, information

1. Introduction

Middlemen play an important role in markets with considerable market imperfections. Essentially, as pointed out by *Yavas* (1994) there are two different types of intermediaries that facilitate market transactions. Market makers, on the one hand, like stock market specialists, act on their own account by buying a certain good from a seller at an ask price and reselling it to buyers at a bid price. On the other hand, matchmakers, like real estate brokers, simply match sellers and buyers without being an active trading party. In addition, as studied by *Biglaiser* (1993), middlemen are usually experts with superior information about market conditions and product characteristics. Hence, they may enhance market efficiency by providing additional consulting services for market participants.

In insurance markets brokers act mainly as matchmakers and offer supplementary services for both policyholders and insurance companies. The social profitability of intermediation depends on the market environment in which transactions take place. In non-commercial insurance markets a broker primarily is concerned with analyzing the insured's risk profile. Given the consumer's individual need for coverage the matching product could be purchased from a variety of carriers.

In this paper we will concentrate on professional insurance markets, where risk profiles are complex and coverage solutions tend to be more individualized. In this case the majority of professional consumers might be able to assess their own needs quite accurately. However, because of capacity limits and product differentiation, the broker's function of finding a matching insurer becomes more important. The broker's comparative advantage in this context is the superior market overview. For instance, brokers can determine the necessary coverage and seek for appropriate offers among different carriers. In addition, brokers typically assume other functions such as the administration of the policy and the transfer of payments between the two parties. Subsequently, it is not very surprising that

brokers are important intermediaries particularly in the context of commercial property and liability insurance as well as in reinsurance.

However, recent events involving major insurance companies and insurance brokerage firms highlight substantial incentive problems in commercial and reinsurance markets where intermediation takes place. In one situation, collusion between an American insurance broker and several insurance companies took place.¹ A coalition of commercial insurance companies agreed to pay “contingent commissions” for brokers, which exceed the size of commonly paid commissions. In return, the receiving brokers presented their customers high premium pseudo-offers of other coalition members. In another case, German commercial insurance companies established a tacit cartel in order to decrease price competition and to enforce higher premiums as a reorganization measure. They particularly agreed to unify terms and conditions and exerted pressure on companies, which tried to lever the cartel, by excluding them from certain pooling solutions.²

In the spirit of *Varian* (1980) and *Schultz* (2004, 2005), this paper considers a Hotelling market with differentiated products, where some consumers are unaware of their own risk profile and market prices. In a situation without intermediation uninformed consumers match randomly with one of two suppliers which leads to a significant inefficiency. In this situation, price competition is not very intensive and suppliers make strictly positive profits. When the costs for an individual risk analysis are sufficiently low, intermediation is potentially beneficial from a social planner’s point of view, see for instance *Baye* and *Cosimano* (1989) or *Cosimano* (1996). However, the increase of market transparency intensifies competition between suppliers and lowers their profits. Therefore, markets with intermediation or high transparency are susceptible to tacit collusion, see, e.g.,

¹ See, e.g., Ruquet, M. and D. Hays, 2004, Spitzer Sues Marsh For Payoffs; 2 AIG Executives Plead Guilty, *National Underwriter / Property & Casualty Risk & Benefits* 108: 6 – 10.

² See, Bundeskartellamt, 2005, “Bundeskartellamt verhängt 130 Mio. Euro Bußgeld gegen Industrieversicherer,“ Press release, March 23.

Schultz (2005). As a further consequence, the suppliers' cartel has reasonable incentives to include the considered broker into their coalition. Furthermore, incentives for tacit collusion can affect the way intermediaries are compensated. Usually two remuneration regimes compete with each other: commission and fee-for-advice systems. For an analysis of these systems in life insurance markets with more than one intermediary and its impact on advice quality see for example *Gravelle* (1994).

The main purpose of this paper is twofold. Firstly, as a starting point, we highlight the potential profitability of insurance intermediation in a Hotelling insurance market with uninformed consumers in either remuneration system. Secondly, we analyze incentives for collusive behavior and evaluate the specific role of insurance brokers within the three-tier relationship between policyholders, insurance brokers and insurance companies. With this respect, we give a theoretical explanation of why a commission system which is weakly preferable from an insurer's point of view is predominant in real insurance markets.

The remainder of the paper is organized as follows. In section 2 the model framework is introduced and a situation without intermediation is analyzed. The potential advantages of intermediation without collusion are considered in section 3. Consequently, in section 4, we regard the possibility of collusion between suppliers and evaluate the specific role of brokers in markets with uninformed consumers. Finally, the paper concludes in section 5.

2. Model without intermediation

The purpose of this section is to characterize the market result without intermediation and to determine the welfare loss which is due to the presence of uninformed consumers on the insurance market. Following *D'Aspremont et al.* (1979), *Hotelling* (1929) and *Schultz* (2004), we consider an insurance market with risk neutral consumers that have heterogeneous

preferences.³ A consumer is located at $x \in [0,1]$, which represents her individual preferences concerning the product characteristics. She purchases one insurance policy at most. There are two insurance companies, $j=0,1$, which are located at the two extremes of the city. Company 0 offers a policy at $x=0$ and company 1 at $x=1$.

Since insurance is a very complex product, it is assumed that only a fraction ϕ of consumers is informed about their precise risk profile or, technically, their location in the interval $[0,1]$, the insurance premiums and the firms' location. Informed and uninformed consumers are uniformly distributed on locations.

Consumers face a disutility from consuming an imperfect insurance product, which increases in the distance to the insurance company. If insurance companies charge premiums p_0 and p_1 , consumer x receives a net utility $v - p_0 - tx$ from buying a policy from insurer 0 and $v - p_1 - t(1-x)$ from buying a policy from insurer 1. An informed consumer is indifferent between buying from company 0 and 1 if she is located at

$$x = x(p_0, p_1) \equiv \frac{p_1 - p_0 + t}{2t}. \quad (1)$$

Uninformed consumers only form expectations regarding their own risk profile x^e and firm i 's premium p_j^e . Their respective net utility of buying insurance coverage is $v - p_0^e - tx^e$ if coverage is purchased from company 0 and $v - p_1^e - t(1-x^e)$ if consumers buy from insurer 1. Since we concentrate on symmetric Nash equilibria in pure strategies⁴ where both insurance companies set the same price and serve both groups of consumers, uninformed consumers with rational expectations $x^e = 1/2$ are ex ante indifferent between both firms. Consequently, they randomly choose their insurance carrier. Subsequently, we assume that each insurance company attracts half of the uninformed consumers.

³ This assumption is due to simplicity reasons, since throughout the paper we are not interested in any risk allocation problems.

⁴ For further analyses concerning mixed strategy equilibria and the existence of a pure strategy equilibrium see, e.g., Schultz (2005) and Varian (1980).

If the willingness to pay for consumers is sufficiently large and $v \geq c + \frac{3}{2}t$ holds, the market is completely covered. Therefore, insurer 0's demand is given by

$$D_0(p_0, p_1) = \phi \frac{p_1 - p_0 + t}{2t} + (1 - \phi) \frac{1}{2}. \quad (2)$$

and firm 1's respective demand is given by $D_1(p_0, p_1) = 1 - D_0(p_1, p_0)$. Given (2) and assuming constant marginal cost $c > 0$ of an insurance policy, the profits of company 0 are given by

$$\pi_0 = (p_0 - c) \left(\phi \frac{p_1 - p_0 + t}{2t} + (1 - \phi) \frac{1}{2} \right). \quad (3)$$

Equilibrium prices are given by

$$\frac{\partial \pi_0}{\partial p_0} = \frac{\phi(p_1 - 2p_0 - c) + t}{2t} = 0. \quad (4)$$

Using the symmetry of the problem, one obtains the price level of

$$-\phi(p + c) + t = 0 \Leftrightarrow p^* = c + \frac{t}{\phi} \quad (5)$$

and a resulting equilibrium profit of

$$\pi_j^* = \frac{t}{2\phi}. \quad (6)$$

The expected net utility of an uninformed consumer u_u^e is given by

$$u_u^* = v - c - t \left(\frac{2 + \phi}{2\phi} \right), \quad (7)$$

whereas informed consumers have the respective ex ante net utility of

$$u_i^* = v - c - t \left(\frac{4 + \phi}{4\phi} \right). \quad (8)$$

Comparing (7) and (8) reveals the welfare loss due to the random matching of insurance companies and uninformed consumers. Since the latter have no information about

their own location, they choose their respective insurance company randomly. Thus, from a social planner's point of view, half of the uninformed consumers match with the wrong insurance company. This mismatching causes a welfare loss of

$$(1-\phi)\left(\frac{1}{2}t - \frac{1}{4}t\right) = (1-\phi)\frac{1}{4}t. \quad (9)$$

The overall welfare in the economy, given by the sum of ex ante net utility $(u_i^* + u_u^*)$ and insurers' profits $\sum \pi_j^*$ is

$$\Phi^* = (1-\phi)\left(v - c - t\left(\frac{2+\phi}{2\phi}\right)\right) + \phi\left(v - c - t\left(\frac{4+\phi}{4\phi}\right)\right) + \frac{t}{\phi}. \quad (10)$$

After some manipulations of (10) one obtains

$$\Phi^* = v - c - t\left(\frac{2-\phi}{4}\right). \quad (11)$$

This overall welfare will only be obtained, if the insurers offer their products at the initially considered positions 0 and 1. However, profit maximizing locations would be outside [0,1]. Thus, products will be more heterogeneous, if firms can decide about their location. A location outside the interval would lead to a decrease in social welfare, because costs of a mismatch are increasing for all consumers.⁵

3. Intermediation without collusion

In this section a completely non-strategic insurance broker or middleman is incorporated into the analysis. We focus on the welfare increasing effect of an honest intermediary who exclusively improves the matching process between uninformed consumers and insurance companies.

In the considered situation a middleman can only be valuable, if he has – compared to uninformed consumers and insurance companies – access to superior information. To keep

⁵ See, e.g., Schultz (2004)

things as simple as possible, the middleman is assumed to be endowed with an information technology that incurs variable cost $k > 0$ and reveals the position x of a consumer perfectly.

Our analysis will be divided into two parts which differ with respect to the payment structure between insurance company, broker and consumer. In the first case, the broker is compensated directly by the insureds (fee-for-advice system). Particularly, neither communication nor monetary transfers between the broker and the insurance company are taking place. The insurance company can not distinguish between informed and previously uninformed consumers, who gained their information from the broker. In the second case, insurance companies pay the broker (commission system).

Let us now turn to the analysis of the fee-for-advice remuneration system. The sequence of the game is as follows: At stage 1 insurance companies simultaneously announce their prices p . Then, at stage 2, the middleman makes a price offer m for an individual risk analysis.⁶ At stage 3, uninformed consumers decide whether to request a risk analysis or not. Finally, at stage 4, all consumers decide whether and where to purchase an insurance policy.⁷

Solving the game by backward induction and assuming v to be sufficiently high, we start analyzing stage 4. Given the equilibrium price offers p^f , uninformed consumers who decided not to have a risk analysis performed by the middleman still choose their insurer at random. Furthermore, informed consumers buy their insurance policy at the “nearest” insurance company. Uninformed consumers prefer to become informed about their own location, if

$$v - p^f - m - \frac{1}{4}t \geq v - p^f - \frac{1}{2}t \Leftrightarrow m \leq \frac{1}{4}t. \quad (12)$$

⁶ We do not consider any specific kind of explicit negotiations with any arbitrary allocation of bargaining power, because this would just lead to a reallocation of rents between the middleman and insurance companies.

⁷ Since in equilibrium all uninformed consumers either ask for the broker’s services or remain uninformed, other sequences have no impact on the qualitative results. The game could be reorganized without any loss of generality so that the broker offers the price for his service at stage 1, just before the insurers announce their premiums.

If $k \leq (1/4)t$, the middleman makes non-negative profits of $\kappa^f = (1 - \phi)(m - k)$.⁸ In this situation all uninformed consumers purchase the risk analysis and become informed about their own risk profile. In a situation where the performance of a risk analysis is not profitable and $k > (1/4)t$, all uninformed consumers prefer to remain uninformed about their risk profile. Therefore, no intermediation takes place and the equilibrium results derived in section 2 are unchanged.

The profitability condition $k \leq (1/4)t$ has direct implications for the relevance of intermediation in different types of insurance markets. As the product space in our model is normalized to one, we cannot directly model different types of markets. Our model, however, still enables us to draw conclusions based upon specific characteristics of commercial versus individual insurance markets. Obviously, given the product space different kinds of insurance markets can in our framework be characterized by the parameters k and t .

Real insurance markets' structure suggests that intermediation tends to be more relevant in commercial and reinsurance than in non-commercial markets. Our framework provides theoretical explanations for this observation. One could argue that the range of potential risk profiles in commercial markets is relatively larger than in non-commercial markets, implying that the disutility of mismatching *ceteris paribus* is greater in commercial markets.

When the risk analysis performed by the middleman is profitable, eventually each consumer makes an informed decision. Using $\phi=1$ and $0 \leq m \leq 1/4t$ ⁹, the equilibrium analysis of section 2 leads directly to the equilibrium premium

$$p^f = c + t \tag{13}$$

and a resulting equilibrium profit of

⁸ For the sake of simplicity, we assume that uninformed consumers accept the offer, if they are indifferent between accepting and rejecting.

⁹ Again, a variation of m can be interpreted as a change in the allocation of bargaining power between the parties involved.

$$\pi_j^f = \frac{t}{2}. \quad (14)$$

In a situation in which consumers pay the brokerage fees directly, the ex ante expected net utility of informed and uninformed consumer is given by

$$u_i^f = v - c - \frac{5}{4}t \quad (15)$$

and

$$u_u^f = v - c - \frac{5}{4}t - m \quad (16)$$

The resulting overall welfare Φ^f in this situation equals the sum of the ex ante net utility of consumers $(u_i^f + u_u^f)$ and both the profits of the middleman κ^f and the insurance companies $\sum \pi_j^f$.

$$\Phi^f = \phi \left(v - c - \frac{5}{4}t \right) + (1 - \phi) \left(v - c - \frac{5}{4}t - m \right) + t + (1 - \phi)(m - k). \quad (17)$$

Rearranging (17) leads to

$$\Phi^f = v - c - \frac{1}{4}t - (1 - \phi)k. \quad (18)$$

Given that intermediation is profitable, and $k \leq (1/4)t$ holds, the lower bound for (18) is given by

$$\underline{\Phi}^f \geq v - c - \frac{2 - \phi}{4}t = \Phi^*. \quad (19)$$

In this case, intermediation leads to an increase in welfare if and only if $k < (1/4)t$. Thus, if intermediation is individually rational for uninformed consumers, it will also be profitable from a social planner's point of view. However, comparing (6) and (14) one can easily see that market intermediation by a middleman reduces the insurers' profits.

Turning towards the commission system, we will address whether or not the latter result concerning the weak social profitability of intermediation remains the same. The

analysis again is divided into two parts. First we assume that insurers cannot distinguish between the different groups of consumers and therefore offer only one price. The second step will introduce the possibility of price discrimination, which gives insurance companies the opportunity to offer different prices for informed and uninformed consumers.

For the analysis of the first case, we can directly use the results of section 2 and additionally implement a broker's service fee m , which has to be paid by the insurers. This leads to

$$\pi_0 = (p_0 - c - (1 - \phi)m) \frac{p_1 - p_0 + t}{2t}. \quad (20)$$

Equilibrium prices are now given by

$$\frac{\partial \pi_0}{\partial p_0} = \frac{p_1 - 2p_0 + c + (1 - \phi)m + t}{2t} = 0. \quad (21)$$

Using the symmetry of the problem, one obtains the price level of

$$-(p - c - (1 - \phi)m) + t = 0 \Leftrightarrow p^c = c + (1 - \phi)m + t. \quad (22)$$

and a resulting equilibrium profit of

$$\pi_j^c = \frac{t}{2}. \quad (23)$$

The result equals the one for the situation in which the insureds pay for the broker's service. The only difference is a redistribution of income from informed to uninformed consumers since the latter only pay a fraction $(1 - \phi)m$ of the risk analysis fee.

Now consider the case of price discrimination. The price for informed consumers p_i^d can be derived directly from the analysis in section 2 as

$$p_i^d = c + t. \quad (24)$$

Uninformed consumers additionally pay for the broker's services. The insurance companies maximize the premium offers subject to the restriction that the consumers' net utility is not lower than in the case in which the broker is directly paid by the consumer. This

condition is due to the fact that the broker would still be able to offer its services directly to the insureds who could subsequently purchase insurance at the price for informed consumers.

The latter constraint leads directly to

$$p_u^d = c + t + m. \quad (25)$$

Using the prices p_i^d , p_u^d and assuming that the insurer pays the amount m to the broker, the profit for an individual insurer is given by

$$\pi_j^d = \frac{t}{2}.^{10} \quad (26)$$

As in section 2 a brief look at the choice of the insurers' position shows that even if market transparency rises to $\phi = 1$, the profit maximizing location of the insurers is still outside $[0,1]$,

specifically they will choose $\left[-\frac{1}{4}; \frac{5}{4}\right]$.

Considering the analysis in this section, the presence of insurance brokers strengthens incentives of insurance companies to override competition in order to raise their profits. In the next section we will analyze these incentives and the impact of tacit collusion between insurance companies upon welfare and middlemen compensation.

4. Intermediation and tacit collusion

In the previous section the middleman's only function was to provide information for uninformed consumers. After the revelation of information by the broker, consumers are able to find the best matching product by themselves. In order to introduce the possibility of collusion, we now extend the previous game structure by introducing a stage 0 where

¹⁰ However, insurance companies may be able to increase their profits by only paying a fraction of m to the broker. Since the broker's cost of risk analysis is $k < m$, the insurer's maximum possible profit is $\tilde{\pi}_j^d = \frac{t}{2} + (1 - \phi)(m - k)$, which includes a redistribution of income from the broker to the insurance companies but has no effect on social welfare. Nevertheless, for the remainder of the analysis we will not consider such a situation.

insurance companies bargain over explicit contracts. Then they present the middleman with a certain offer for his service. The limiting fact for the coalition is the payoffs in the case without collusion. Particularly, the following participation constraints

$$\pi_j^{tc} \geq \frac{t}{2}. \quad (27)$$

and

$$\kappa^{tc} \geq 0 \quad (28)$$

must hold.

Condition (27) considers the fact that an insurance company's individual profit under tacit collusion must weakly exceed the profits π_j^f or π_j^c without collusion. The non-negativity constraint (28) is due to the ability of the colluding insurers to exclude the broker from the market. If the broker offers a fee-for-advice service simultaneously, the sum of fee, insurance premium and costs of mismatch of an uninformed consumer would exceed his initial willingness to pay.

The straightforward approach of the coalition is to maximize their overall profit given the limited willingness to pay v . The decision problem regarding the risk analysis is unchanged compared to section 3. Therefore, irrespective of the payment arrangements for a broker's service the performance of risk analysis activities is profitable from the coalition's point of view whenever $k \leq \frac{1}{4}t$ holds. The optimal arrangement has to ensure that uninformed consumers purchase the risk analysis service. Moreover, after the risk analysis it must be individually rational for all types of consumers to purchase insurance coverage.

The second constraint is only fulfilled if and only if consumers located at $x = \frac{1}{2}$ that face the maximum disutility of $\frac{1}{2}t$ purchase insurance coverage. Surprisingly, the participation constraint of consumers has a direct impact on the optimal design of payment arrangements.

Again, the fee-for-advice and the commissions system have to be analyzed separately. At first glance, both payment structures seem to be payoff equivalent from the coalition's point of view. However, this is not the case, as the following considerations clarify.

Assume a situation where the broker is paid directly by uninformed consumers. Consequently, insurance companies are unable to distinguish between informed consumers and previously uninformed consumers. Hence, insurance can only be offered at a uniform premium. The implementation of a fee $m > 0$ paid by uninformed consumers would lower the maximum feasible insurance premium for previously uninformed consumers. Therefore, insurance companies would have to reduce their premium offers for all consumers by m in order to guarantee participation by all types of consumers. In consequence, the resulting loss for the coalition corresponds to $\phi \cdot m$ and therefore the payment regime where brokers are paid by insurance companies is strictly preferable for the coalition. The maximum possible insurance premium in the latter regime is given by

$$p^{tc} = v - \frac{1}{2}t. \quad (29)$$

The overall profit of the coalition is

$$\Pi^{tc} = v - c - \frac{1}{2}t - (1 - \phi)k. \quad (30)$$

The three potential participants will only join the coalition, if the sum of their individual payoffs in the non-collusion case is not higher than (30). Explicitly

$$2 \cdot \frac{t}{2} + (1 - \phi)\left(\frac{1}{4}t - k\right) \leq v - c - \frac{1}{2}t - (1 - \phi)k \quad (31)$$

must hold.

Rearranging (31) leads to

$$v - c \geq \left(\frac{7 - \phi}{4}\right)t. \quad (32)$$

Generally, collusion between insurance companies will only be beneficial, if the disutility of mismatching is considerably low or the intensity of price competition is sufficiently high. The LHS of (32) represents the maximum possible profit of an insurance coalition in a situation where the offered policies are perfect substitutes. Under these conditions, without collusion both companies would make zero profits. Therefore, the potential benefits from collusion would be maximized for the coalition, while social welfare does not change compared to the competition case.

Welfare can even be improved by agreeing on terms and conditions, which are represented by a change of the position of both insurance companies from $x = 0$ and $x = 1$ to $x = \frac{1}{4}$ and $x = \frac{3}{4}$. With this kind of collusion a first-best-optimum can be reached in our model, as the expected costs of mismatching are reduced for informed and uninformed consumers. The maximum possible insurance premium in this case is given by

$$p^{fb} = v - \frac{1}{4}t \quad (33)$$

and the overall coalition's profit is

$$\Pi^{fb} = v - c - \frac{1}{4}t - (1 - \phi)k. \quad (34)$$

Every uninformed consumer should use the broker in order to purchase the best product at the fixed price p^{fb} , because the maximum costs would be v . Obviously, not contacting the broker could lead to a negative expected utility and is therefore not a valuable option for uninformed consumers.

At this point we also have to add the possibility of rationing to our analysis. The question is, whether or not it is more profitable for the insurers to increase their prices in order to extract additional rents from some consumers, while others do no longer buy insurance, because their payment reserves are exceeded.

In general collusion is only profitable, if

$$\frac{1}{2}\Pi^{ct} \geq \pi_j^f \quad (35)$$

which can be rearranged to

$$\frac{v - c - \frac{1}{2}t - (1 - \phi)k}{2} \geq \frac{t}{2}. \quad (36)$$

Using $k \leq \frac{1}{4}t$, collusion is individually rational for each insurance company if

$$v - c \geq \left(\frac{7 - \phi}{4}\right)t \quad (37)$$

holds.

On the other hand, given the overall profit of the coalition under collusion

$$\Pi^{tc} = (p - c - (1 - \phi)k)\frac{1}{2}t(v - p), \quad p \in \left[v - \frac{1}{2}t, v\right] \quad (38)$$

rationing is only profitable, if

$$\left. \frac{d\Pi^{tc}}{dp} \right|_{p=v-\frac{1}{2}t} = \frac{1}{2}t(v - 2p + c + (1 - \phi)k) > 0. \quad (39)$$

The latter condition is equivalent to

$$v - c < \left(\frac{5 + \phi}{4}\right)t. \quad (40)$$

Comparing (37) with (40) one can easily see that rationing is not advantageous for the insurers in the considered context.

5. Conclusions

In the light of recent events in commercial insurance markets, this paper considers collusion incentives and compensation structure for insurance brokers. In markets with uninformed consumers and heterogeneous risk profiles, intermediation has the potential to improve social

welfare. However, since intermediation reduces insurers' market power, incentives for tacit collusion are higher compared to markets without intermediation.

A controversial matter in the discussion concerning insurance intermediation is the issue of compensation customs. Our analysis provides explanations for the counterintuitive observation that brokers are usually compensated by insurance companies. As long as intermediation is profitable, it is irrelevant from a social welfare point of view whether brokers are paid by uninformed consumers or by insurance companies. From the insurer's point of view though, a system in which brokers are solely compensated by insurance companies is strictly preferable when the demand side consists of informed and uninformed consumers. The rationale for the latter is the fact that a fee paid by uninformed consumers limits the insurers' opportunity to extract rents from both types of potential insureds.

A limitation of our analysis is the fact that we do not examine the broker's incentive problem. In our model the broker acts completely non-strategic. Particularly, every uninformed consumer is matched with the nearest supplier. However, in reality, brokers may have incentives to mismatch uninformed consumers. For example, when commissions for different products vary and disutility of mismatching is non-verifiable, brokers are able to collect contingent commissions from suppliers for directing additional consumers to them. Contrasting our results, such a situation with strategic experts market intermediation may not necessarily lead to an increase of social welfare.¹¹

¹¹ See, e.g., Darby and Karni (1973); Emons (1997); Wolinsky (1993).

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For orders please contact / Kontaktadresse für Bestellungen:

Prof. Dr. Martin Nell
Geschäftsführender Direktor des
Instituts für Versicherungsbetriebslehre
Von-Melle-Park 5
D-20146 Hamburg

Tel.: +49-(0)40-42838-4014

Fax: +49-(0)40-42838-5505

E-mail: martin.nell@rrz.uni-hamburg.de

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