

# Freedom of Services and Competition in Insurance Markets: A Note

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## *Abstract*

We study entry in markets which are characterized by adverse selection. The analysis is motivated by the introduction of freedom of services in insurance markets at the European Community (EC) level. We assume that entrants in each domestic market (large multinational firms) are more efficient due to scale/scope economies but suffer an informational disadvantage. Incumbent firms, on the other hand, have perfect information about risks but incur higher production costs. We show there may exist competitive equilibria in which both types of firms coexist. The idea is that each technology trades-off production costs with information costs.

**Key words:** Freedom of Services, Demand Diversion, Demand Creation

## **1. Introduction**

Recent European Community legislation has aimed at building a common market in insurance with freedom of services between countries. The opening of the insurance market has two main aspects: (1) the right of establishment, that is, a firm already established in any EC country can open a subsidiary in another EC country without being subject to any kind of discrimination in access conditions; and (2) freedom of services, that is, a firm established in a EC member state can offer insurance contracts in any other country within the EC without needing to set up a permanent structure in that country.

Small firms are typically worried about survival in this European single market, where they will have to compete with much bigger firms. Nevertheless, it has been suggested that for mass risks, the advantages of small firms—being closer to the consumer, having greater versatility, better information and knowledge on a case by case basis—could outweigh the advantages of larger firms, namely economies of scale and/or of scope.

In order to assess this conjecture, we consider a simple adverse selection model of an insurance market (Section 2). We assume that firms can be of two types (defined as above) and compute the competitive Rothschild-Stiglitz equilibrium (Section 3). We conclude that there exist equilibria in which the two types of firms are active. Also, entry by the low cost, uninformed firms implies both a demand creation and a demand diversion effect. The existence of market equilibrium and the implications of imperfect competition are briefly considered in section 3. Section 4 presents final remarks and concludes.

## 2. The model

We assume there is a population of consumers who are subject to the probability of an accident loss. The amount of loss is equal for all consumers. The probability of a loss, independent across consumers, can either be high (type-2 consumers) or low (type-1 consumers). Individual's actions do not affect accident probabilities. Each consumer has a utility function of wealth, continuously differentiable, exhibiting non-satiation and risk-aversion. The consumer's choice maximizes expected utility over the set of contracts offered by all firms in the market. When indifferent between two contracts a consumer chooses the one intended to his type. Each consumer can buy only one insurance contract.

There are two kinds of firms: "domestic" firms and "foreign" firms. Incumbent firms are "domestic" firms. The definition of domestic firms includes both national firms and subsidiaries of firms based in other countries. "Foreign" firms offer insurance contracts without having a permanent establishment in the country in the current period. Both types of firms are risk neutral and behave competitively.

Domestic firms have superior information due to their proximity to customers. Specifically, it is assumed that they can identify each consumer's type. They have an administrative cost  $c_d$  of underwriting a contract, and offer, in a competitive equilibrium, full insurance to all types of agents ( $c_d$  is sufficiently low so that all consumers demand insurance).<sup>1</sup>

Foreign firms have an administrative cost  $c_f$  for each contract. They have a cost advantage due to economies of scale/scope or to better technology:<sup>2</sup>  $c_f < c_d$ . However, they cannot tell if a consumer is a low or a high risk. Insurance contracts proposed by them must be incentive compatible and allow, ex-post, differentiation between high and low risks. Those contracts are characterized by full insurance offered to high risks and less than full insurance to low risks.<sup>3</sup>

The sequence of events is: (1) Nature chooses consumers' types. Each consumer observes his type, which is revealed only to him and to domestic firms; (2) domestic and foreign firms offer contracts to consumers. These offers are observed by all firms and consumers; (3) consumers choose a contract from the set of contracts offered. The choices are observed by all firms and consumers; (4) Nature determines whether a loss occurs to each consumer  $i$ ; and (5) contract provisions are applied accordingly.

To eliminate unreasonable equilibria we impose the requirement of *subgame perfection*. This amounts to requiring that consumers choose the insurance contract that maximizes their expected payoff from the set of contracts offered.

This is a version of the Rothschild and Stiglitz's [1976] equilibrium concept.<sup>4</sup>

## 3. Equilibrium characterization

Since we assume competition between insurance firms and free entry equilibrium profits will be zero; all the surplus is captured by consumers.

Good risks will have a lower utility with an incentive compatible contract compared to a full information contract (with the same administrative cost). This is the usual result of “efficiency at the top”: high types are served efficiently while imposing a negative externality on low types.

We are now in position to characterize market equilibrium upon implementation of freedom of services.

### 3.1. Demand diversion effects

**Proposition 1:** *If foreign firms have a cost advantage and an informational disadvantage over domestic firms and if they offer incentive compatible insurance contracts then:*

- (1) *high risks always prefer to sign insurance contracts with foreign firms; and*
- (2) *low risks will buy insurance from foreign firms only if the cost difference is sufficiently large.*

In equilibrium, good risks may buy insurance from domestic firms if the cost differential is not too great. In this case, full insurance with a high-cost contract is inferior, in expected utility terms, to less than full insurance with a low-cost contract. Foreign firms with an administrative cost advantage offer separating contracts that attract high risks, regardless of risk preferences. They can also attract good risks if their administrative cost is low enough. The crucial element is the trade-off between administrative costs and contract distortion costs (due to imperfect information).

Figures 1 and 2 present both cases. Notation will be maintained in all figures presented below and is given by:  $U_i$  is utility of agent of type  $i$  when making an insurance contract with firm  $j$ ;  $P_j^i$  is the zero profit line for firm  $j$  when selling an insurance contract to agent of type  $i$ ;  $(\gamma_1, \gamma_2)$  is the equilibrium pair of contracts offered by informed (domestic) firms to consumers of type 1 and consumers of type 2, respectively;  $(\theta_1, \theta_2)$  is the equilibrium pair of contracts offered by uninformed (foreign) firms to consumers of type 1 and consumers of type 2, respectively;  $c_f = OA$ ,  $c_d = OB$  are administrative costs of foreign and domestic firms respectively; finally,  $O$  is the situation with no insurance (initial position).

From Figures 1 and 2 we can see that contract  $\theta_2$  always gives a higher utility level than contract  $\gamma_2$ . On the other hand, superiority of contract  $\theta_1$  over contract  $\gamma_1$  is not assured. The distortion caused by imperfect information in foreign firms' contracts must be weighed against a larger administrative cost in domestic firms' contracts. In Figure 1 all agents prefer foreign firms. In Figure 2, the good risks prefer domestic firms and bad risks prefer foreign firms. In either case, a shift from domestic insurance firms to foreign insurance firms occurs. The extent of the demand diversion effect depends upon the cost differences across domestic and foreign firms and consumers risk aversion.

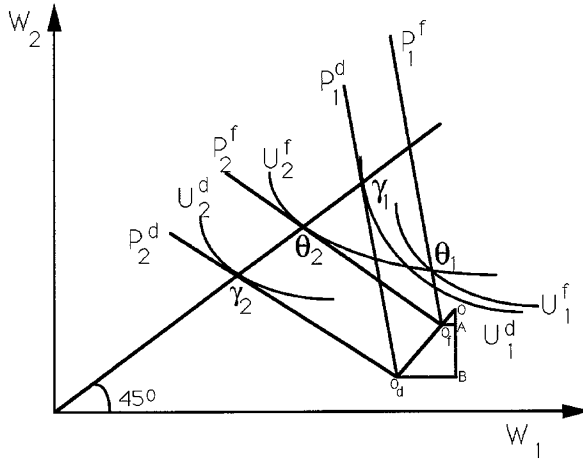


Figure 1. Good risks choose foreign firms.

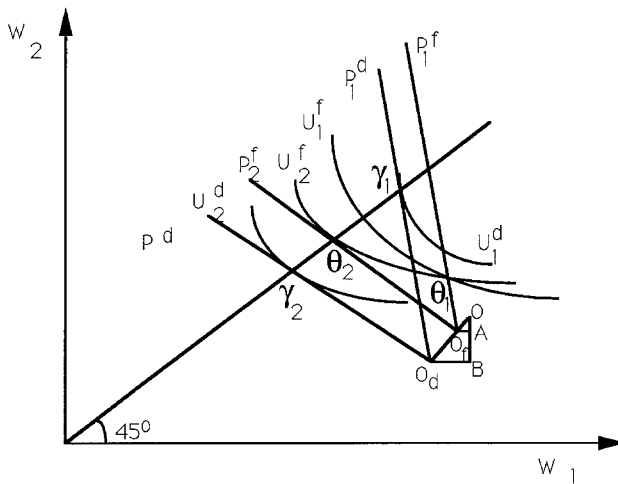


Figure 2. Good risks choose domestic firms.

### 3.2. Demand creation effects

Suppose that prior to the freedom of services regime, some consumers had chosen to stay out of the market. That means that for a full insurance contract and a cost per contract  $c_d$  their participation constraint was not met. The excluded consumers could be high or low risks since the risk premium of risk averse consumers is initially increasing and then decreasing in  $p_i$ . A consumer is willing to pay for

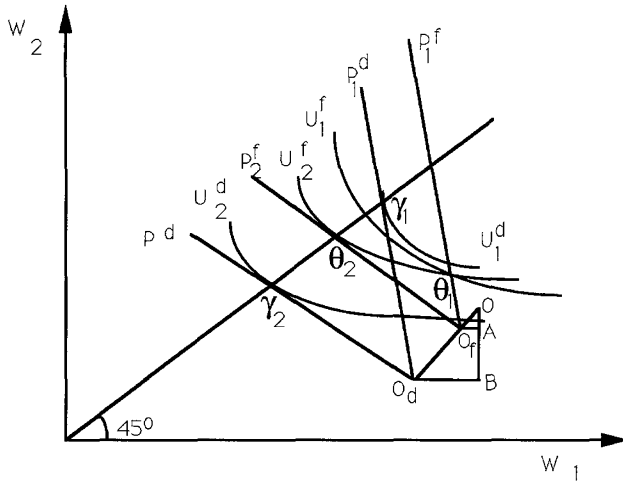


Figure 3. First case—High risks enter the market.

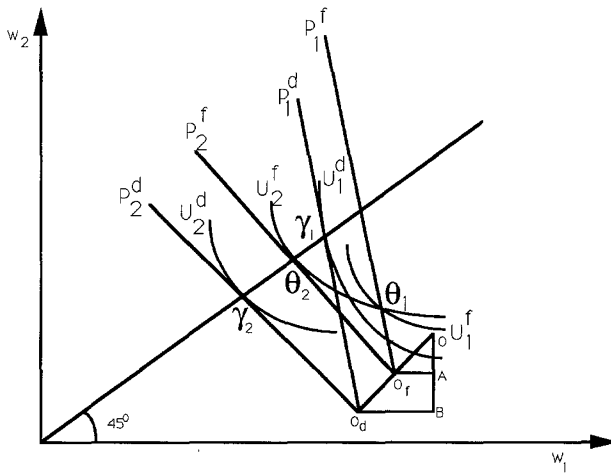


Figure 4. Second case—Low risks enter the market.

the full cover contract provided by informed firms at most  $p_i L$  plus the Arrow-Pratt risk premium, which is zero for  $p_i = 0$  or  $1$  and positive for  $p_i \in (0, 1)$ . With some positive cost to be borne out, for sufficiently low/high  $p_i$ , the associated risk premium is lower than that cost and it is possible that low risks do not buy insurance from informed firms when high risks do and vice-versa.

These cases are in Figure 3 and Figure 4. In Figure 3, before entry of foreign firms, high risks choose not to enter the market: the expected utility level

achieved with contract  $\gamma_2$  ( $U_2^d$ ) is lower than the utility level associated with no insurance (point  $O$ ). But the contracts with full insurance offered by foreign firms, with cost  $c_f$  are sufficiently attractive to motivate their entry in the market ( $U_2^f(\theta_2) > U_2(O)$ ). Low risks can be diverted or not towards foreign firms depending on the configuration of their preferences. Hence, a demand diversion effect may, or may not, coexist with a demand creation effect.

In Figure 4, good risks are initially out of the market. However cost savings in foreign firms' contracts are large enough to induce entry of low risks ( $U_1^f(\theta_1) > U_1(O)$ ). Note that we also have the demand diversion effect upon high risks. In both cases, new entrants will always buy insurance from foreign firms.

We have thus established an informal proof of the following proposition.

**Proposition 2:** *Depending on accident probabilities, freedom of services may induce high or low risk types who did not buy insurance from domestic firms to buy from foreign firms.*

It is possible that only demand creation effects exist, with no demand diversion. With more than two types of consumers, one can show that demand creation may be the only effect of entry by uninformed firms. The intuition comes from putting together Figures 3 and 4 in the same diagram. Participation in the market by new consumers with high accident probabilities distorts contracts offered by foreign firms to the previously highest type of consumer in the market. The utility cost of this distortion may not be fully compensated by cost savings. On the other hand, new consumers of very low type may cause no changes in existing contracts. A very low type consumer can accept a contract offer from a foreign firm and leave contracts for all other (higher) types of consumers unchanged since incentive compatible contracts are defined, in equilibrium, with reference to next highest risk type.<sup>5</sup> The contract can be profitable for that consumer without inducing deviation from higher-type consumers because the contract distortion (less than full insurance) is relatively less important for sufficiently low probabilities of accident.

### 3.3. Existence of market equilibrium

The separating pair of contracts offered by foreign firms can be an equilibrium in pure strategies if the proportion of low risks is small enough. Note that a higher proportion of bad risks implies a greater impact of freedom of services on domestic firms.

On the other hand, if high risks choose foreign firms and low risks domestic firms then both types of consumers have full coverage contracts and the problems of equilibrium existence in pure strategies are mitigated.

### 3.4. *Domestic monopoly*

Since it is doubtful whether insurance markets are truly competitive, it seems desirable to consider the case of a domestic monopoly, which is subsequently open to foreign competition (through freedom of services).<sup>6</sup>

The domestic monopolist firm has perfect information about consumers' types. It establishes insurance contracts that extract all consumers' surplus from all types. If we retain the assumption that foreign firms are more efficient, then the result that some fraction of the market is diverted towards foreign firms still holds; foreign firms capture at least the high types. Furthermore, all premiums charged decline.

The cost difference that allows foreign firms to capture all of the market is the same whatever the structure of the domestic market insurance is (competitive or monopoly). This is so because the best contract a monopolist can offer, without making losses, to prevent consumers from switching to foreign firms is the competitive contract.

Even when foreign firms do not capture the whole market, low risk consumers get the same expected utility as they would with the separating contracts offered by foreign firms. The domestic monopolist cannot sell them a worse contract.

The condition that determines whether all insurance demand is diverted is the same as in the perfect competition case. The extent of demand diversion does not rely on the assumption of perfect competition. Demand creation effects can also be present, and in similar circumstances to the competitive market.

## 4. Final remarks

The effect of freedom of services on demand for insurance can be decomposed into demand diversion and demand creation effects. Demand diversion is a shift of demand away from domestic firms and towards foreign firms. Demand creation means that foreign firms induce otherwise uninsured consumers to enter the market and buy insurance from them.

Allowing freedom of services is a Pareto improvement in a competitive setting. Domestic firms have zero profits, so the only welfare effect accrues to consumers, who are made better off. In the domestic monopoly case, welfare effects are not so clear. With demand diversion there is an increase in consumers' surplus and a profit transfer from domestic firms to foreign firms. On the other hand, demand creation effects are always welfare enhancing since they imply no profit transfer. If demand creation is the only effect, freedom of services constitutes clearly a Pareto improvement. Old contracts are unaffected and new contracts make very high and/or very low type consumers better off.

The results suggests that survival of small, locally-oriented firms is possible even if they are not able to fully exploit scale/scope economies, provided they can retain superior information about consumer risks.

The acquisition/revelation of information through time is not considered in the model and attention should be devoted to it in future research. Here, we restrict ourselves to a one-period model. The model presented can be best interpreted as describing the short-run effects of freedom of services in the domestic insurance market.

Another point concerns the motivation for firms to engage in freedom of services activities, as opposed to other ways of entering foreign markets. Activities under the freedom of services regime provide a high degree of control over contracts offered in foreign markets. At the same time, they require a minimum of capital commitment to the foreign market. These features will probably rank the regime of freedom of services high in the preferences of insurers about modes of entry in foreign markets.<sup>7</sup> We can expect firms to have some motivation to make use of the freedom of services regime.

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### Notes

1. This cost is added to the pure premium paid (calculated at fair prices). Administrative costs could have been considered as proportional to insurance quantity purchased. The results would not change qualitatively, although derivation of results would be more tedious.
2. This formulation of the problem arises naturally from the question we want to address. The crucial element is that uninformed firms have some cost advantage from size.
3. See Cooper [1984, page 573] or Rothschild and Stiglitz [1976, pages 636–637].
4. For alternative equilibrium concepts, see Desruelle [1989], Grossman [1979], Hellwig [1987], Miyazaki [1977], Riley [1979], Spence [1978] and Wilson [1977].
5. See Cooper [1984].
6. Even when market structure seems pro-competitive, it is not clear that a competitive outcome will prevail, as Joskow [1973] found for the US market.
7. On this see Schroath [1988].

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