Harmful competition in insurance markets☆

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ABSTRACT

There is a general presumption that competition is a good thing. In this paper we show that competition in the insurance markets can be bad and that adverse selection is in general worse under competition than under monopoly. The reason is that monopoly can exploit its market power to relax incentive constraints by cross-subsidization between different risk types. Cream-skimming behavior, on the contrary, prevents competitive firms from using implicit transfers. In effect monopoly is shown to provide better coverage to those buying insurance but at the cost of limiting participation to insurance. Performing simulation for different distributions of risk, we find that monopoly in general performs (much) better than competition in terms of the realization of the gains from trade across all traders in equilibrium.

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1. Introduction

In this paper we address the critical question: how and how well competition on the markets handles the fundamental problems of information. With imperfect information, market actions or choices convey information and we know from earlier work (e.g. Rothschild and Stiglitz, 1976) that inefficiency and even existence problems can arise in competitive markets because the slight change in the action of the informed side of the market discretely changes beliefs of the other side of the market. While information asymmetries inevitably arise, the extent to which they do so and their consequences on the realization of the gains from trade depend on how the market is structured. This raises the fundamental question of the interplay between two forms of market imperfections: imperfect information and imperfect competition. There is no particular reason why competition should be better in the presence of imperfect information. The simplest way by which this would not be true is when the firm could exploit its market power to relax the incentive constraints.

The aim of this paper is to evaluate the efficiency of competition on the insurance market in the presence of adverse selection. Using the benchmark model of Rothschild and Stiglitz (1976), we contrast the competitive equilibrium outcome with the monopoly equilibrium outcome à la Stiglitz (1977) and we compare their relative efficiency. Following Rustichini et al. (1994), the (expected) efficiency of an equilibrium is the fraction whose numerator is the expected gains from trade across all traders in the equilibrium and whose denominator is the gains from trade across all traders with full information. Using this criterion we compare the monopoly outcome with one seller of insurance contracts and many potential buyers with different risks against the competitive outcome imposing zero profit on each contract that might be offered in equilibrium. With a continuum of types it is well known that a competitive equilibrium à la Rothschild–Stiglitz does not exist. To address this issue, some alternative equilibrium concepts, based either on game theoretic refinements or on a Walrasian approach, have been proposed in order to ensure the existence of competitive equilibria. Even though no general agreement has been reached so far about the equilibrium concept, the general intuition in the classical as well as more recent literature is that competition typically results in the provision of a set of contracts that fully separate types (Chiappori, 2006). In this paper we refer to the concept of reactive equilibrium developed by Riley (1979) and Engers and Fernandez (1987) for which the Pareto-dominant full separating zero-profit outcome is the unique reactive equilibrium.[1]

The key finding is that the monopoly outcome, in general, is more efficient than the competitive outcome (according to our expected efficiency criterion). The reason why monopoly performs better than competition is that the monopolist can *exploit its market power* to offer contracts that better satisfy the incentive constraints. More precisely, the monopolist can offer contracts with implicit transfers across agent types that can relax the incentive constraints and implement a larger set of allocations. This is one of many examples of the interplay between market imperfections (see Jaffe and Stiglitz, 1990; Stiglitz, 1975). The economy, in effect has to trade off between two different imperfections: imperfections of information or imperfections of competition, with no particular reason that these imperfections will be balanced optimally. As we shall see, competition provides all risk types with an insurance contract, but coverage is only partial. On the contrary, under monopoly low risk types are forced to quit the market, but coverage increases for the participating risk types.

Our paper continues a line of research begun by Stiglitz (1977), who analyzed monopoly insurance markets, and compared the equilibrium outcome with the (two-type) competitive outcome. In his qualitative comparison Stiglitz shows how the high-risk consumers always buy full coverage at a price larger than the fair premium, while the low risks buy partial insurance, both under monopoly and competition. A further qualitative comparison is performed by Dahlby (1987) in the same two-type framework and shows that monopoly may be better than competition when there are enough low types. In our analysis with a continuum of types we show that monopoly performs better than competition for almost any possible distribution of risk types, and not only in the case of a large proportion of low-risk types; i.e., when insurance generates little surplus.[2]

We perform this analysis in a non-expected utility framework using the *dual theory approach* to choice under risk developed by Yaari (1987). It turns out that by using this specification of individual preferences we are able to provide a clear-cut comparison between monopoly and competition. The dual theory has the property that utility is linear in income, and risk aversion is expressed entirely by a transformation of probabilities in which bad outcomes are given relatively higher weights and good outcomes are given relatively lower weights. In our simple two-state model the probability of bad outcome is weighted up by a loading factor. It would be absurd to suggest that the dual theory provides a better model than the expected utility. The latter has obvious appeal and has provided so many useful results in insurance theory. Nonetheless, we feel there is some gain from studying the properties of our simple non-expected utility model, even if only to derive some clear insights on the efficiency of competition in the presence of adverse selection.[3]

A similar approach is used by Attar et al. (2011) who analyze a model of adverse selection à la à la Akerlof (1970) but with divisible goods. As in our model, they consider agents with linear preferences both on quantities (which is coverage in insurance markets) and money. However, they focus on nonexclusive contracts and show that, contrary to our result, the competitive equilibrium entails extreme choices for the agents depending on their type: either the whole endowment is sold or no treed occurs (in the insurance setting this equilibrium would be that some types get full insurance and all the other types do not buy any coverage). In the present paper, where we focus on exclusive contracts, we show that the competitive equilibrium is characterized by a continuum of partial coverage contract monotonically increasing with the risk type of the agent and only the highest risk type gets full coverage. It is only under monopoly that we have a result qualitatively similar to Attar et al. (2011): a pool of high risk types buys a full coverage contract, while all the other types buy no contract at all. A line of research that is closely related to non-expected utility theory considers the distortion in the probabilities as a result of

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[1] This is also the equilibrium allocation achieved in a Walrasian equilibrium (Bisin and Gottardi, 2006). See also Hellwig (1987) and Dubey and Geanakoplos (2002) for other equilibrium concepts leading to the same resource allocation.

[2] In a different setting, a labor market where workers suffer from social comparison, von Siemens (2012) analyzes the competitive equilibrium when workers' ability is private information. He shows that competition between firms generate rent extraction by skilled workers, which in turn increases inequality and may provoke inefficient sorting into unemployment. If there is only one firm in the economy, this monopsonist can reduce rent extraction by skilled workers and the differences in the wage workers receive. Interestingly, it is the firm's ability to perform cross-subsidization that increases the efficiency of the monopsonist equilibrium.

[3] Another distinctive property of insurance under dual theory is that the demand of insurance cannot decrease with wealth. In contrast, the expected utility model makes the comparison between competition and monopoly difficult since by charging a higher premium (relative to competition) for a given coverage the monopoly increases the marginal willingness to pay for insurance.