Market Failure for Insurance

starting from 22.11.2021

Abstract

This article considers an insurance market after one company collapses. In this new frame, the suplly and demand will quicky react and one can stress if the Solvency II regime and other regulations can help in calming the market.

Keywords: Supply and Demand; Insurance; Solvency II; Ruin

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1 Introduction

After a collapse of one of the insurance companies, the price for insurance and the number of people insured varies when addapting to a new situation. We study these relationships, known as comparative statics, for insurance markets that suffer from adverse selection with imposed regulations and asymmetric information. We will base our study on the Romanian market which had to deal with City Insurance collapse.

This is an automatically generated report using the latest information and tries to adapt the main ideas from future data.

2 General Framework

First let us have a look at the demand and supply for insurance markets. The demand curve is downward sloping by construction. One might be surprised to see that the supply curve it is different from the teoretical case. Because the price is set by actuaries, which set the price based on the quantity of risk transferred. This will mean that the Supply curve should be a horizontal line, if no barriers.

On the market level, if the quantity is low, the price goes up because of the increased volatility and the cost of the minimal capital requirements (CoC of MCR). More risks should lower the price up to a level (SCR>MCR), where the Capital pressure should become more important than the volatility.

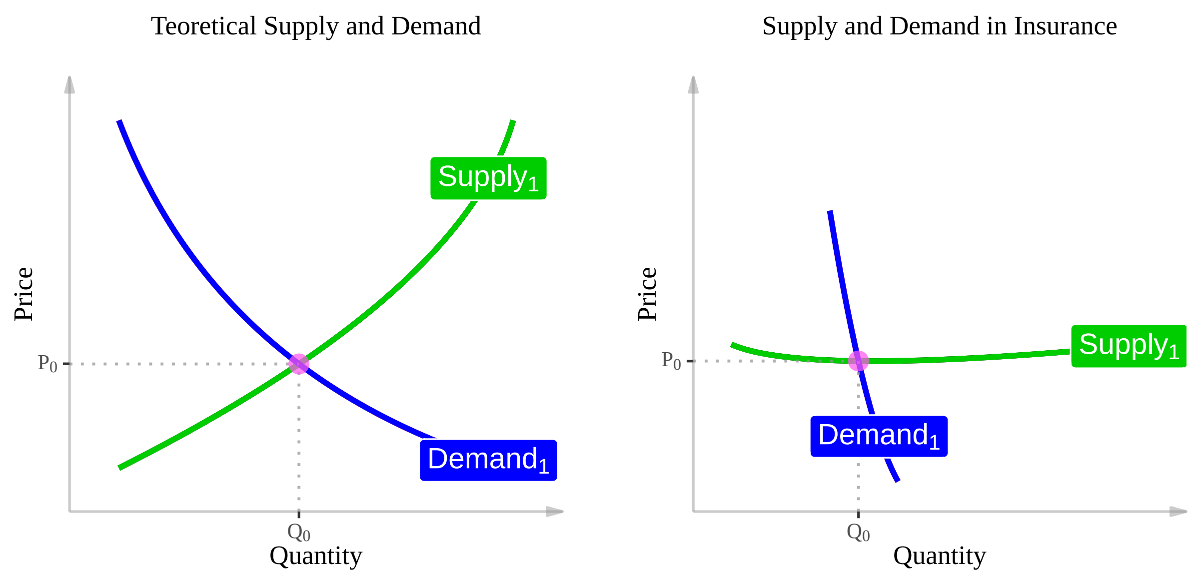

Figure 1: Teoretical Supply and Demand

Suppose there is a unit measure of risk-averse agents, heterogenous in their financial risk,[1] x. Koch (2017) and other utiliy based authors, use the same concept, that we want here to further develop. We introduce the exposure effect to the model and eliminate the utility concept. An agent could decide to lower the exposure in order to reduce the risk, either by driving less (MTPL), taking medication, or even living in other country.

Each agent's risk, at historical exposure, is characterized by $\lambda \in \mathbb{R}$, with conditional expectation $\mathbb{E}[x|\Gamma = \lambda] \in \mathbb{R}$. Risk types are distributed according to a second distribution, $\lambda \sim \Gamma$. We maintain the oversimplification that λ is a number, not a random variable. Though λ, it is strictly correlated with the agent's exposure, or anti selection.

Agents with wealth w and preferences $u(\cdot)$ have a willingness to pay for insurance, $\pi(\lambda)$, which is the premium amount that makes the agent indifferent between paying $\pi(\lambda)^2$ for insurance, or facing the risk without insurance:

$$u(w - \pi(\lambda)) = \mathbb{E}[u(w - x) \,|\, \Gamma = \lambda] \tag{1}$$

The above formula is static and uses another simplification, assuming that marginal utility does not change with the realization of the risk. Because of the Bonus-malus like systems (BMs), the premiums will be adjusted on every step of the BMs, let's call it a year, or step 1. Then,

$$u(w - \pi_1(\lambda) - \pi_0(\lambda)) = u(w - \pi_0(\lambda)) + \mathbb{E}[u(w - x) \,|\, \Gamma_e = \lambda]$$

where we introduce the personal exposure e. $\Gamma_e = \lambda$ should mean that the risk is distributed by an exposure conditional distribution. Now we can, by definition

Definition 2.1. Let $u : \overline{\mathbb{R}} \to \mathbb{R}_+$, be a function that satisfies the equation:

$$u(w - \pi_1(\lambda) - \pi_0(\lambda)) = u(w - \pi_0(\lambda)) + \mathbb{E}[u(w - x)|\Gamma_e = \lambda] \tag{1}$$

As other already Jaynes (2003) noted,

Risk aversion means that willingness to pay for insurance is greater than expected outcome.

[1]x should be the risk premium per year at full exposure.
[2]the premium offfered doesn't consider the real exposure, but the full exposure.

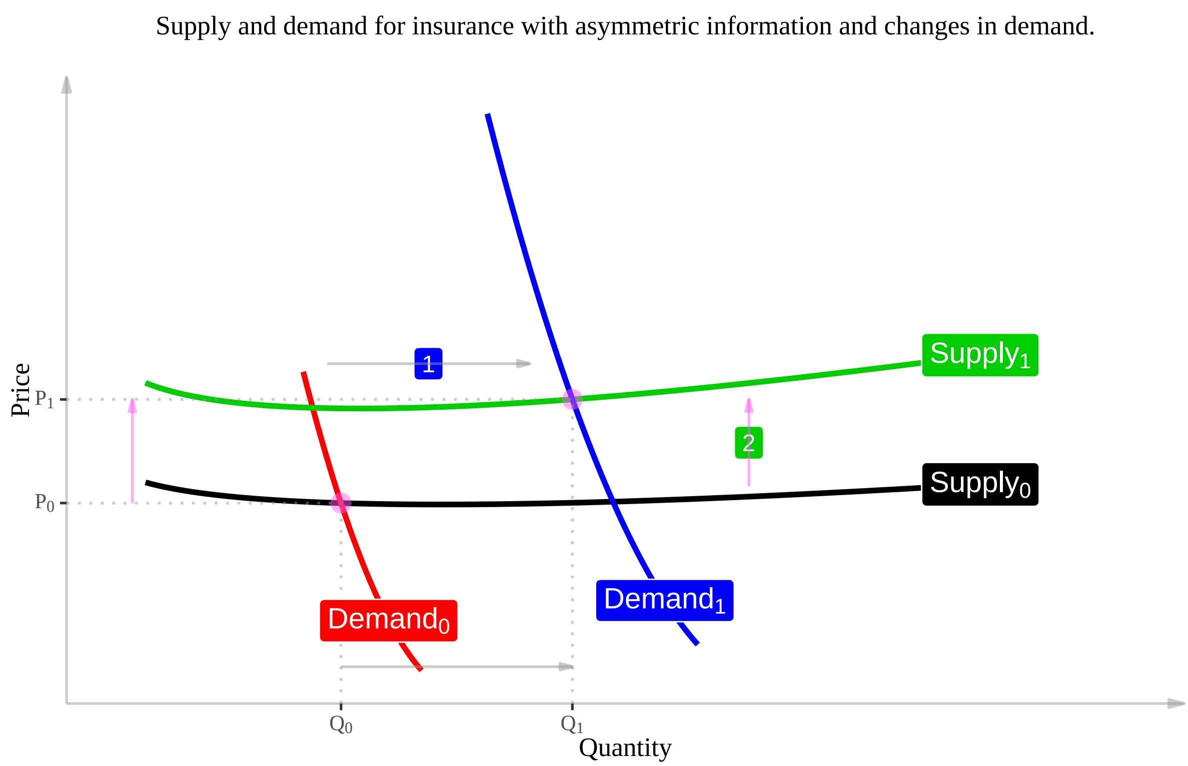

Figure 2: Supply and Demand after 2 steps. First, the demand increases for the remaining players, who, in step 2, will increase the price

3 Romania's Case, City Insurance

The company suddenly made a hugh impact on demand. Almost 45% from the market should find another insurer. In the real of a compulsory MTPL product, the demand will change faster than the supply who is also

4 Sovency II impact

4.0.1 Conflicts of Interest{-}

The views expressed in this article are those of the author.

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