

Institute of Insurance Economics



University of St.Gallen

Stock vs. Mutual Insurers: Who Should and Who does Charge more?

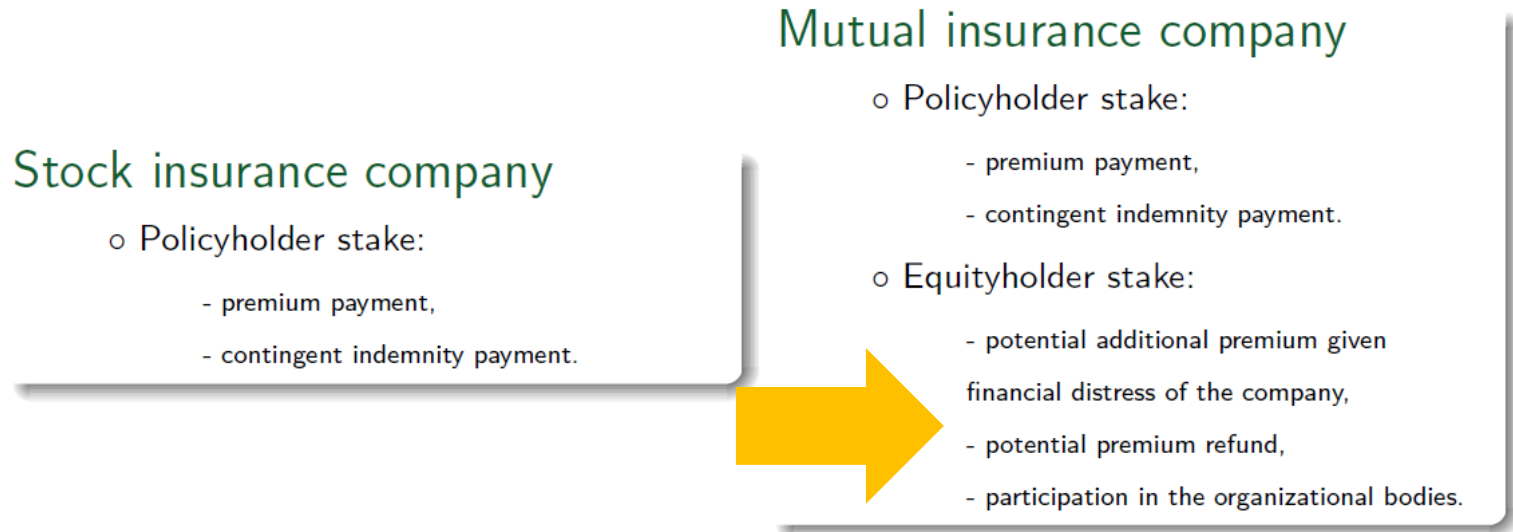
Working Paper by A. Braun, P. Rymaszewski, H. Schmeiser

EGRIE 2012

- **Introduction**
- **Model framework**
- **Comparison of competitive premia**
- **Empirical Results and Economic Implications**

Introduction

- **Mutuals vs. Stock insurance companies:** Different rights and obligations should theoretically imply diverging marginal insurance premiums



- **Aim of the paper:** Pricing and breakdown of the competitive insurance premium in a contingent claims setting
- **Reflection with empirical findings:** Comparing the competitive premium with market premiums

Structure

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Stock insurer

Equityholder stake

$$\begin{aligned} EC_0^S &= e^{-r} E_0^Q (\max [A_1 - L_1; 0]) \\ &= e^{-r} E_0^Q (A_1 - L_1) + DPO_0^S \end{aligned}$$

Default put option

$$DPO_0^S = e^{-r} E_0^Q (\max [L_1 - A_1; 0])$$

Policyholder stake

$$P_0^S = e^{-r} E_0^Q (L_1) - DPO_0^S$$

Mutual insurer: Full participation in equity payoff

Equityholder stake

$$EC_0^{\text{Mf}} = e^{-r} E_0^{\mathbb{Q}} (A_1 - L_1) + RO_0 + DPO_0^{\text{M}}$$

Default put option

$$DPO_0^{\text{M}} = PO_0^{\text{X}} + BPO_0$$

where

$$PO_0^{\text{X}} = e^{-r} E_0^{\mathbb{Q}} (PO_1^{\text{X}}) = e^{-r} E_0^{\mathbb{Q}} (\max [X - A_1; 0]),$$

$$BPO_0 = e^{-r} E_0^{\mathbb{Q}} (BPO_1),$$

$$BPO_1 = \begin{cases} C^{\max} & \text{for } A_1 \leq X \\ 0 & \text{for } A_1 > X \end{cases},$$

and

$$X = L_1 - C^{\max}$$

Mutual insurer: Full participation in equity payoff

Recovery option

$$RO_0 = \lambda DPO_0^S - \lambda PO_0^{X^*} - BPO_0,$$

where

$$PO_0^{X^*} = e^{-r} E_0^Q \left(PO_1^{X^*} \right) = e^{-r} E_0^Q (\max [X^* - A_1; 0])$$

and

$$X^* = L_1 - \frac{1}{\lambda} C^{\max}$$

with the special case for $\lambda = 1$:

$$\begin{aligned} RO_0^{\lambda=1} &= DPO_0^S - DPO_0^M \\ &= DPO_0^S - PO_0^X - BPO_0 \end{aligned}$$

Mutual insurer: Full participation in equity payoff

Policyholder stake

$$P_0^M = e^{-r} E_0^Q (L_1) - RO_0 - DPO_0^M$$

Arbitrage-free premium

$$\begin{aligned} \Pi_0^M &= P_0^M + EC_0^{Mf} \\ &= \underbrace{e^{-r} E_0^Q (L_1) - RO_0 - DPO_0^M}_{\text{policyholder stake}} \\ &\quad + \underbrace{e^{-r} E_0^Q (A_1 - L_1) + RO_0 + DPO_0^M}_{\text{equityholder stake}} \\ &= e^{-r} E_0^Q (A_1) \end{aligned}$$

Mutual insurer: Partial participation in equity payoff

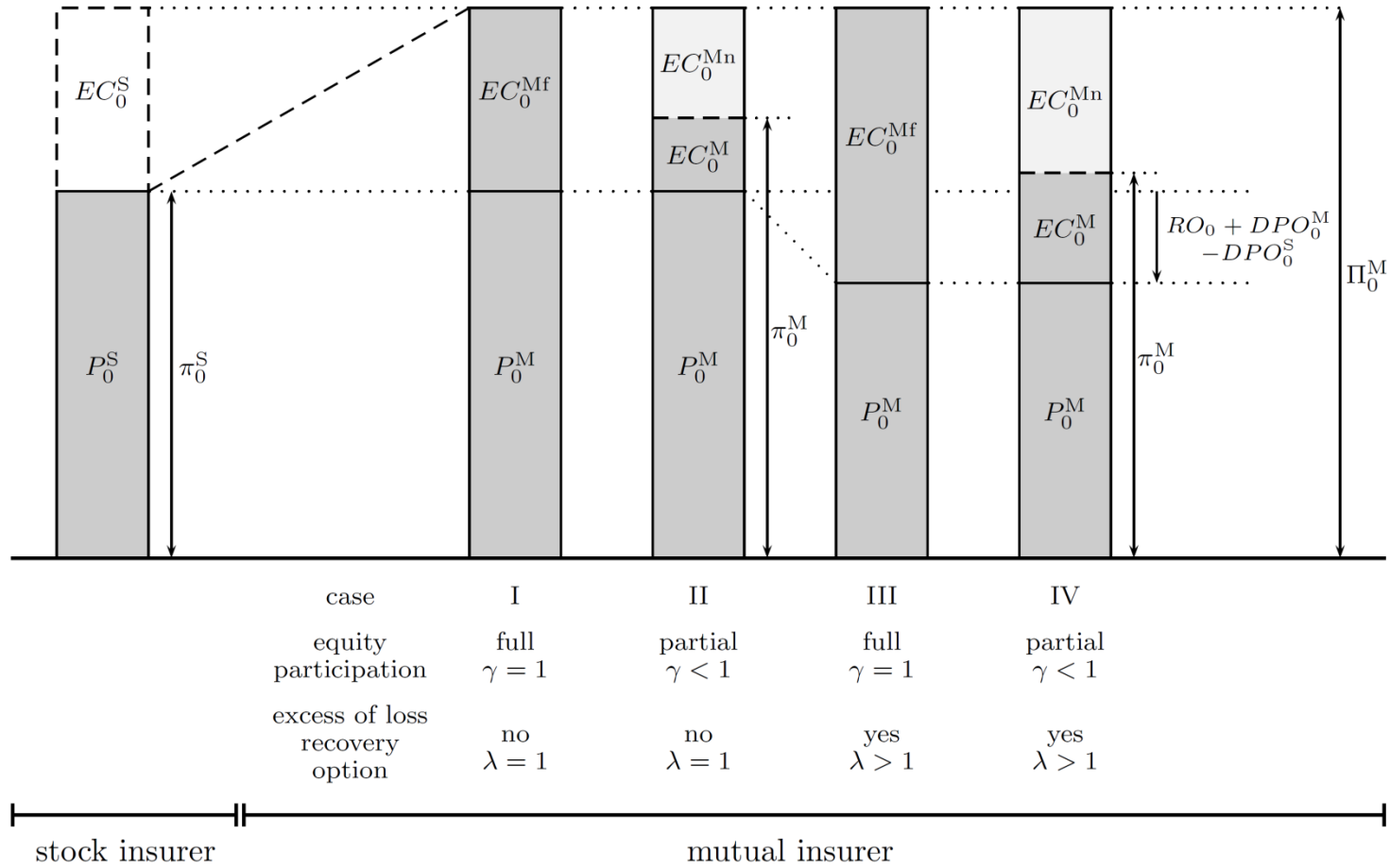
Arbitrage-free premium

$$\begin{aligned}
 \Pi_0^M &= P_0^M + EC_0^M + EC_0^{Mn} \\
 &= \underbrace{e^{-r} E_0^Q (L_1) - RO_0 - DPO_0^M}_{\text{policyholder stake}} \\
 &\quad + \underbrace{\gamma e^{-r} E_0^Q (A_1 - L_1) - (p_L - \gamma) DPO_0^S + p_L (RO_0 + DPO_0^M)}_{\text{realizable equity stake}} \\
 &\quad + \underbrace{(1 - \gamma) e^{-r} E_0^Q (A_1 - L_1) + (p_L - \gamma) DPO_0^S + (1 - p_L) (RO_0 + DPO_0^M)}_{\text{non-realizable equity}} \\
 &= e^{-r} E_0^Q (A_1)
 \end{aligned}$$

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Schematic overview



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A quick look in the empirical analysis

- Annual account figures for the German motor vehicle liability insurance sector
- 99 stock and 14 mutual insurance companies
- 2000-2006, unbalanced panel data covering 532 and 87 firm years for stock and mutual insurance companies respectively
- Price measured by the average annual gross premium (amount of losses in the motor insurance line divided by the number of contracts)
- We control for various additional factors which are likely to influence the insurance price (too)
- Non of the three used tests* find evidences that mutuals charge higher premiums than stock insurer

Interpretation and Implications

- Given the Figure on Slide 11, the premium charged by a mutual should exceed the one charged by a stock company
 - This may not be the case, if the capitalization of the mutual companies and the safety levels (measured by the value of the default put option) are very low
 - Not the case here (data are tested in respect to capitalization); in addition, the same solvency requirements for both legal forms take place
- Possible explanations:
 - Market faced no competitive pricing; wealth transfer between different stakeholder groups and stakeholder generations take place
 - Asymmetric information: Policyholders are not aware of their rights in a mutual / in a stock company and hence are not willing to pay different prices
 - Former mutual members paid for a part of non-realizable assets without being granted in form of an adequate compensation → current market premiums can be lowered → wealth transfer between generations of policyholders in the mutual