

Stock vs. Mutual Insurers: Who Does and Who Should Charge More?

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Different rights and obligations associated with the legal form should affect the marginal insurance premium

Motivation:

- Private insurance companies are organized either as stock or mutual firms
- There is no secondary market for mutual equity stakes
- Distressed mutual insurers can call in additional premiums (recovery option)
- Due to these aspects, marginal premiums of stock and mutual firms should differ

Contribution:

- Empirical and theoretical analysis of the premiums charged by stocks and mutuals
- Panel data analysis for the German motor liability insurance sector
- Contingent claims model framework for the pricing of stock and mutual insurance
- Comparison of stock and mutual insurers (premium size, safety level, and capital)

The large body of existing literature does not cover legal-form dependent premium difference

- Agency issues

(see, e.g., *Mayers and Smith, 1981, 1986, 1988, 2005*)

- ▶ Owner-policyholder conflict (more intense in stock insurance firms) versus...
- ▶ Owner-manager conflict (more intense in mutual insurance firms)

- Information asymmetries

(see, e.g., *Smith and Stutzer, 1990, 1995*)

- ▶ Parallel existence of both legal forms
- ▶ Size of mutual companies

(see *Ligon and Thistle, 2005*)

- Further differences between stock and mutuals

- ▶ Reasons for (de)mutualization

(see, e.g., *McNamara and Rhee, 1992; Viswanathan and Cummins, 2003; Zanjani, 2007*)

- ▶ Differences in efficiency

(see, e.g., *Spiller, 1972; Cummins et al., 1999; Jeng et al., 2007*)

- ▶ Differences in capital structure

(see, e.g., *Harrington and Niehaus, 2002*)

Mutuals do not seem to charge significantly higher premiums than stocks

	Hausman-Taylor	FEVD Procedure	Fixed Effects Model
(Intercept)	-213.4151*** (-2.6692)	-237.3012*** (-12.1466)	—
<i>AvLoss</i>	0.3420*** (15.4295)	0.3469*** (9.9042)	0.3420*** (10.9533)
<i>AvCosts</i>	0.6053*** (7.3825)	0.5994*** (6.1891)	0.6053*** (3.9955)
<i>EqR</i>	20.0231 (1.0095)	15.7489* (1.9075)	20.0231 (0.5184)
<i>LTP</i>	19.2463*** (7.0319)	18.7959*** (17.3699)	19.2463*** (7.3742)
<i>Stock</i>	-3.9429 (-0.0470)	33.7803*** (14.7292)	—

Coefficients and t-statistics (in parentheses) for Hausman-Taylor estimator, the FEVD procedure, and the standard FE model. The average annual premium (*AvPrem*) is regressed on the following set of explanatory variables: average annual losses (*AvLoss*), average annual costs (*AvCosts*), equity ratio (*EqR*), and logged total premium (*LTP*). Hausman-Taylor and FEVD additionally include the time-invariant variable legal form (*Stock*). ***, **, and * denote statistical significance on the 1, 5, and 10 percent confidence level. The analysis is based on the accounting data (2000-2006, source: Hoppenstedt) for German insurance companies offering motor vehicle liability insurance. A panel data set contains 99 stock and 14 mutual insurers covering 532 and 87 firm years for stock and mutual insurance companies, respectively.

Table: Estimation results

The employed contingent claims model framework is based on the work of Doherty and Garven (1986)

- Stock insurer claims structure

$$EC_0^S = e^{-r} E_0^Q (A_1 - L_1) + DPO_0^S$$

$$P_0^S = \pi_0^S = e^{-r} E_0^Q (L_1) - DPO_0^S$$

- Mutual insurer claims structure

- ▶ Full participation in equity payoff

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

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

- ▶ Partial participation in equity payoff

$$EC_0^M = \gamma e^{-r} E_0^Q (A_1 - L_1) - (p_L - \gamma) DPO_0^S + p_L (RO_0 + DPO_0^M)$$

$$EC_0^{Mn} = (1 - \gamma) e^{-r} E_0^Q (A_1 - L_1) + (p_L - \gamma) DPO_0^S + (1 - p_L) (RO_0 + DPO_0^M)$$

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

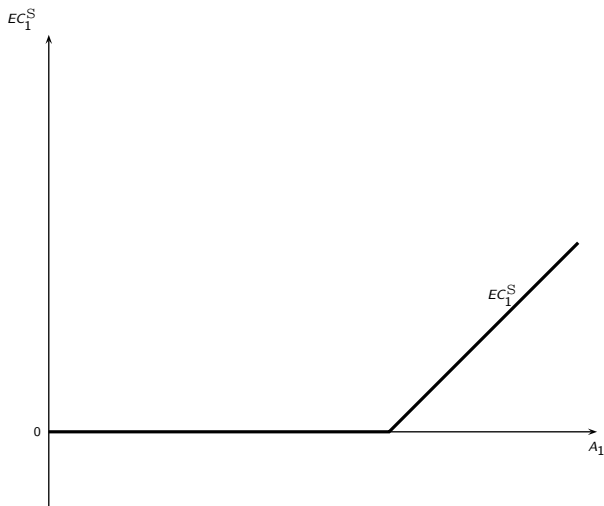


Figure: Payoff to the equityholders EC_1^S and policyholders P_1^S of a stock insurance company in $t = 1$

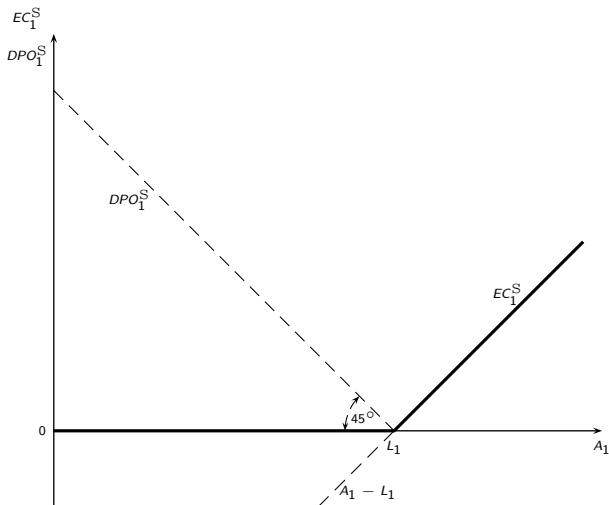


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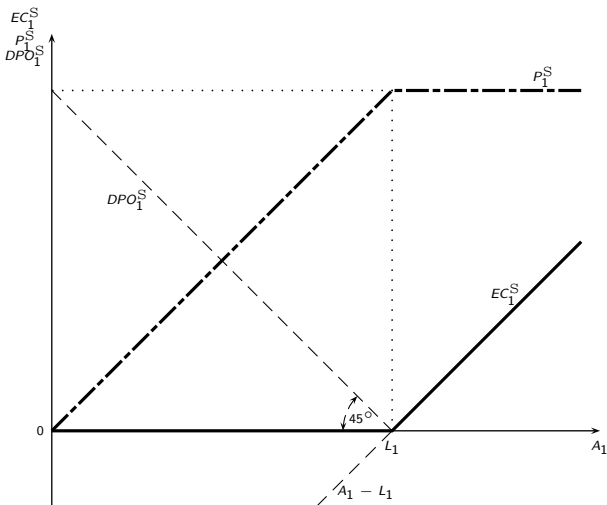


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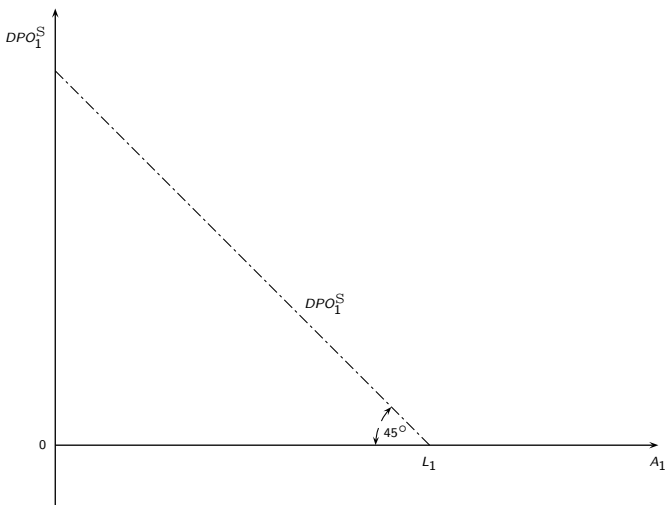


Figure: Mutual insurer default put option payoff in $t = 1$ (DPO_1^M)

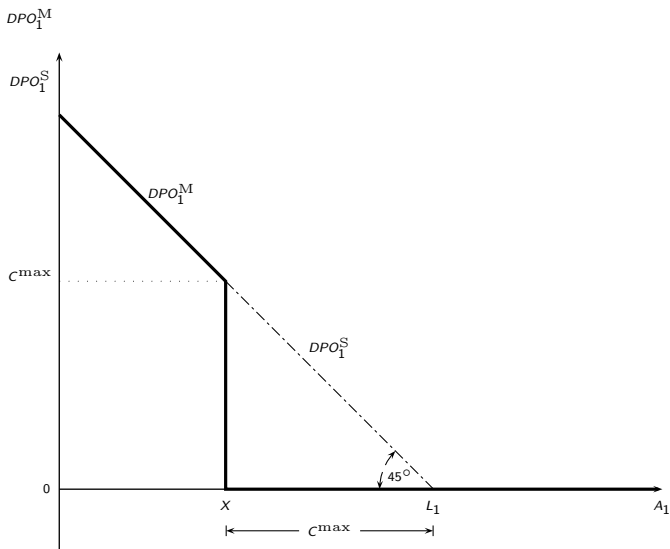


Figure: Mutual insurer default put option payoff in $t = 1$ (DPO_1^M)

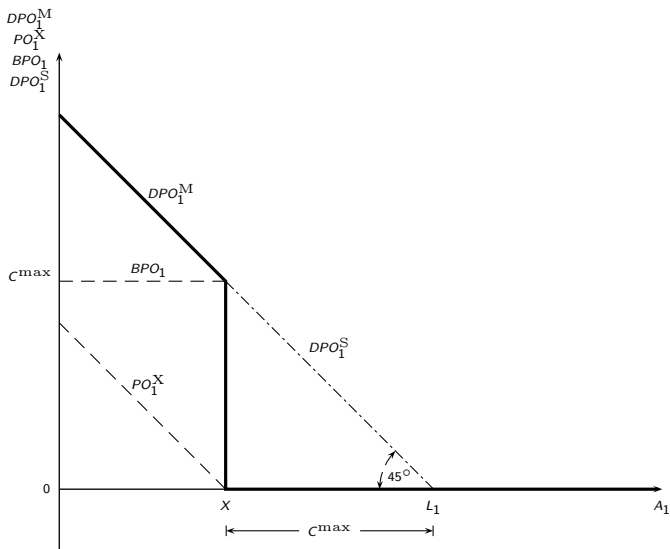


Figure: Mutual insurer default put option payoff in $t = 1$ (DPO_1^M)

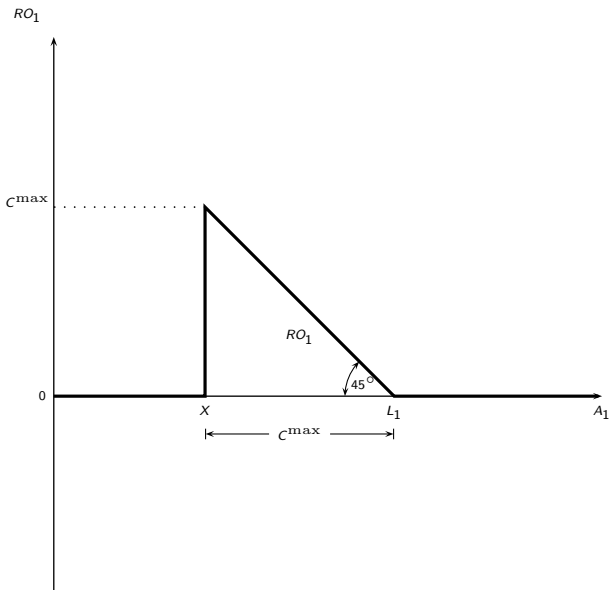


Figure: Mutual insurer recovery option payoff in $t = 1$ (RO_1)

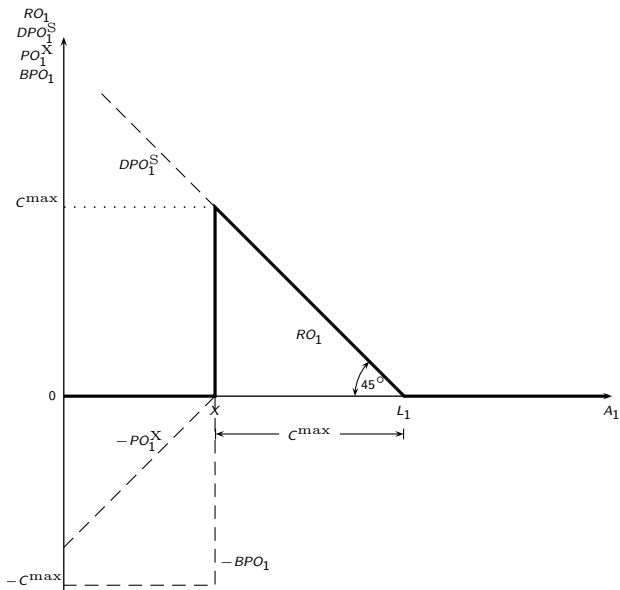


Figure: Mutual insurer recovery option payoff in $t = 1$ (RO_1)

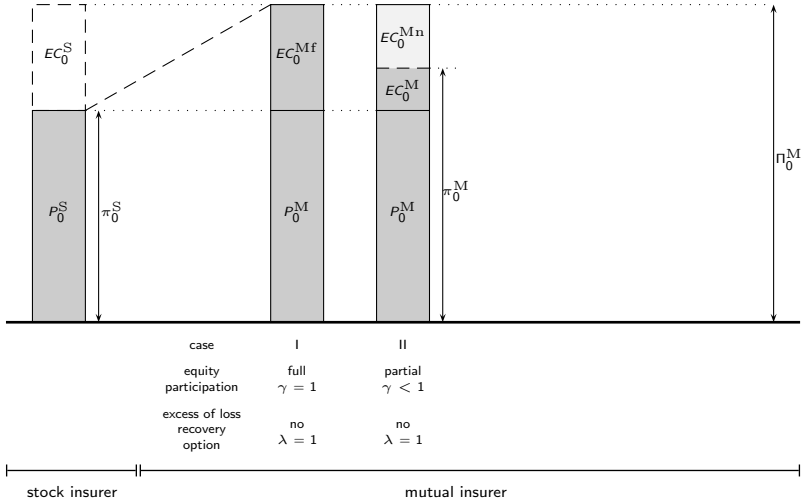


Figure: Comparison of premia

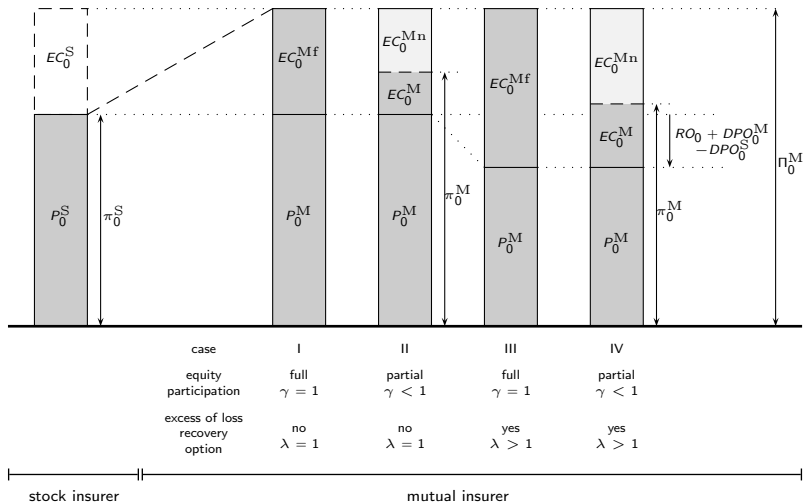


Figure: Comparison of premia

The mutual insurer can offer the same or a lower premium as the stock insurer if it holds less capital

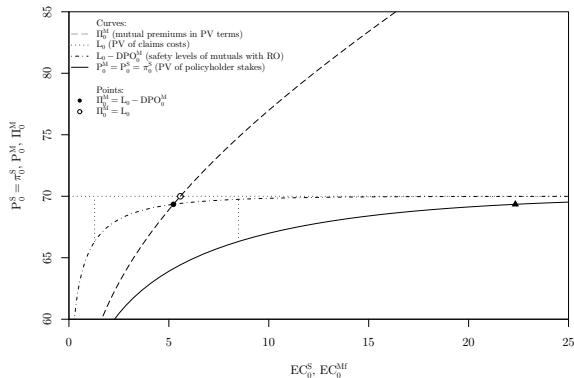


Figure: Equity-premium combinations for full equity participation/recovery option

Arbitrage opportunities suggest wealth transfers

Summary:

- No empirical evidence that mutuals charge significantly higher premiums
- According to the normative results, however, mutuals should usually charge more
- Equality of premiums would require the mutual to hold less equity capital
- The inconsistency between empirical and theoretical results indicates a mispricing

Conclusion:

- Potential violation of the no-arbitrage principle due to asymmetric information
- There are likely to be wealth transfers between different stakeholder groups
- Could identify the size and direction of these wealth transfers in future research
- Our normative results also raise questions as to why these forms actually coexist

Thank you for your attention

Further information

- **References**

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