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

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Motivation and Contribution

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**
  
  - 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)
Empirical analysis

Mutuals do not seem to charge significantly higher premiums than stocks

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

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**
    \[ EC_0^{Mn} = (1 - \gamma) e^{-r}E_0^Q (A_1 - L_1) + (p_L - \gamma) DPO_0^S + (1 - p_L) \left( RO_0 + DPO_0^M \right) \]
    \[ P_0^M = e^{-r}E_0^Q (L_1) - RO_0 - DPO_0^M \]
Figure: Payoff to the equityholders $EC_1^S$ and policyholders $P_1^S$ of a stock insurance company in $t = 1$
Figure: Payoff to the equityholders $EC^S_1$ and policyholders $P^S_1$ of a stock insurance company in $t = 1$
**Figure**: Payoff to the equityholders $EC_1^S$ and policyholders $P_1^S$ of a stock insurance company in $t = 1$
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
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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