Paying for a Refund
Return-of-Premium Contracts in Insurance

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1. Introduction

2. How not to explain premium returns
   - Risk aversion (Expected Utility Theory)
   - Reference dependence

3. Explanations for the use of premium returns
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4. Conclusion
Real world contracts and choices are sometimes difficult to reconcile with standard preferences and beliefs.

- DellaVigna and Malmendier (2006) show that contract choices for gym memberships are inconsistent with a standard rational preferences.
  → Explanation: Hyperbolic consumer preferences.

- Sydnor (2010) shows that homeowners often purchase insurance contracts with low deductibles at prices significantly above the expected value.
  → Explanation: Overweighting of probabilities and loss aversion

- Many people prefer a tax return at the end of the year to higher monthly income, although the IRA does not pay interest on the return.

We take a closer look at insurance contracts that entail different kinds of ex post payments usually labeled as "premium returns".
In insurance markets two types of return-of-premium contracts can be observed.

- **Contingent premium returns**: Are contingent on the fact that a specific policyholder has not filed a claim during a given time period.
  
  - Incentive device e.g. in health insurance (substitute for deductibles)
  
  - In disability and casualty insurance incentive problems are less prevalent, but return-of-premium contracts can be observed.

- **Unconditional premium returns**: Refund independent of claiming behavior.
  
  - Combination of a traditional insurance contract with an additional saving component that guarantees an unconditional payment at the end of the contract.

  → Rates of return for these contracts are well below easily achievable market returns.
Standard model

- Risk-averse consumer with utility function $u()$, $u' > 0$, $u'' < 0$ and an initial wealth $w_0$
- Loss $L$ occurs with probability $\pi$
- Interest rate is zero
- Insurance contract (one period) consists of
  - a coinsurance rate $\alpha$ and
  - a premium $P_0 = \alpha \lambda \pi L$ ($\lambda \geq 1$ loading factor)

Maximization problem

$$\max_{\alpha} E[u(\alpha)] = (1 - \pi) \cdot u(w_0 - P_0) + \pi \cdot u(w_0 - P_0 - (1 - \alpha)L)$$

- Mossin’s Theorem (1968):
  $$\alpha^* = 1 \quad \text{if} \quad \lambda = 1$$
  $$\alpha^* < 1 \quad \text{if} \quad \lambda > 1$$
Conditional premium return

- The absolute amount $B \geq 0$ is paid at the end of period in the case of no loss.

$$\max_{\alpha,B} E[u(\alpha,B)] = (1 - \pi) \cdot u(w_0 - P_0 - (1 - \pi)B + B) + \pi \cdot u(w_0 - P_0 - (1 - \pi)B - (1 - \alpha)L)$$

- Since:

$$\frac{\partial E[u(\alpha,B)]}{\partial B} \bigg|_{B=0} \leq 0 \quad \forall \alpha \in [0,1]$$

→ Any conditional premium return $B > 0$ weakly decreases expected utility of a risk-averse consumer.
Unconditional premium return

- The amount $B \geq 0$ is paid at the end of period irrespective of the loss realization.

\[
E[u(\alpha, B)] = (1 - \pi) \cdot u \left( w_0 - P_0 - \frac{B}{1 - \tau} + B \right) + \pi \cdot u \left( w_0 - P_0 - \frac{B}{1 - \tau} - (1 - \alpha) L + B \right)
\]

- The unconditional premium return does not entail any risk transfer.

- It just affects the certain level of final wealth.

  $\rightarrow$ The unconditional premium return will be purchased ($B > 0$) if the rate of return ($\tau$) is above the interest rate ($\tau > 0$).

Utility is derived from two sources:
- Standard consumption utility depending on wealth level \( w \)
- Loss-gain utility from comparing the final wealth in different states with a reference point \( r \)

\[
E[u(w, r)] = u(w) + \mu(u(w) - u(r))
\]

The reference point is the full distribution of recent expectations.

→ There is not one, there are many reference points (every possible outcome)
2. How not to explain premium returns

Reference dependence

Unconditional premium return

- In the model of Köszegi and Rabin a sure gain and an equally sized sure loss will cancel each other out.
  → The unconditional premium return is equivalent to a standard insurance contract.

Conditional premium return

- Due to loss aversion, even a risk neutral individual prefers to buy insurance (Köszegi and Rabin, 2007)
- However, due to loss aversion, the optimal insurance contract entails full coverage $\alpha^* = 1$ but no conditional premium return ($B^* = 0$), as the latter increases risk.
A regret averse individual experiences a disutility ex-post when his ex-ante decision leads to a suboptimal result.

Approach of Braun and Mürmann (2004):

\[ \text{RTEU} = E[u(w) - k \cdot g(u(w^\text{max}) - u(w))] \quad \text{with } k > 0 \]

Disutility \( g(\cdot) \) is convex. The factor \( k \) measures the extent of regret aversion.

Braun and Mürmann (2004) show for standard insurance contracts that regret averse individuals purchase partial insurance \( (\alpha^* < 1) \) even at a fairly priced premium \( (\lambda = 1) \).

An unconditional premium return only affects the sure wealth level \( w \).

→ Regret preferences cannot explain the demand for unconditional premium returns.
Conditional premium returns

- Final wealth levels:

<table>
<thead>
<tr>
<th></th>
<th>No loss (1-(\pi))</th>
<th>Loss ((\pi))</th>
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</thead>
<tbody>
<tr>
<td>No insurance ((\alpha=0))</td>
<td>(w_0)</td>
<td>(w_0 - L)</td>
</tr>
<tr>
<td>Insurance ((\alpha,B))</td>
<td>(w_0 - P_0 - (1-\pi)B + B)</td>
<td>(W - P_0 - (1-\pi)B - (1-\alpha)L)</td>
</tr>
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\[
\text{RTEU}[\alpha,B] = (1 - \pi) \cdot [u(w_0 - P_0 + \pi B) - k \cdot g(u(w_0) - u(w_0 - P_0 + \pi B))] \\
+ \pi \cdot [u(w_0 - P_0 - (1 - \pi)B - (1 - \alpha)L) - k \cdot g(u(w_0 - P_0) - u(w_0 - P_0 - (1 - \pi)B - (1 - \alpha)L))] 
\]

- Increasing the premium return above \(B = 0\) is increasing RTEU for a given level \(\alpha\) if

\[
k > \frac{u'(w_0 - P_0 - (1 - \alpha)L) - u'(w_0 - P_0)}{g'_L + g'_L}
\]

\(\rightarrow\) A regret averse individual prefers a strictly positive premium return (\(B^* > 0\)) if regret aversion (\(k\)) is sufficiently high.
3. Explanations for the use of premium returns

Alternative explanations

Supply-side factors

- Due to higher premium payments, return-of-premium contracts may entail higher commissions, which might give higher selling incentives for agents (irrespective of higher loadings).
  → Consumers might be willing to buy contracts if they misjudge the desirability of the savings component embedded into a return-of-premium contracts.
- People buying these contracts might be better risks, therefore premiums might be very attractive.
  → Advantageous selection

Time inconsistency problems

- People often state that they want to increase their savings but they "never get around" (Thaler and Sunstein, 2008).
- If they had access to a commitment device, they would be willing to pay a premium for this (Ashraf et al., 2006).
  → Insurance products with saving components might be such a commitment vehicle.
Many insurance contracts entail a return of premium component.

Conditional premium returns can be explained by regret preferences.

→ In the case of no loss, consumers receive a benefit which lowers their regret from their decision to buy insurance.

Unconditional premium returns are not easily reconcilable with standard models.

If consumers

– are confused and mistakenly take up inferior savings vehicles, just forbidding return-of-premium contracts would improve efficiency.

– have time inconsistency problems, efficiency can be improved by additional saving components (unconditional premium returns).