U.S. Producer Price Indexes for Non-Life Insurance
NAICS 524111 & 524126 (ISIC 6512)

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Agenda

- Definition of service being priced
- Pricing unit of the service
- Market conditions & constraints
- Classification/publication structures
- Pricing methods
- National accounts & measurement issues
- Quality adjustment
- Results
Definition of service being priced

- Two non-life insurance industries – Direct Health & Medical; Direct Property & Casualty
- Primary output is assumption of risk and financial intermediation
- Policy underwritten by insurer represents unique output – transfer of risk of financial loss from policyholder to insurer
Pooling vs. Assumption of Risk

- Pooling approach: Insurer as intermediary between policyholders – collects premiums & disburses them to claimants (Premiums less claims)
- Transfer approach: Insurers assume risk from policyholders – collects premiums & invests to offset premium payment, i.e. assumes risk
- US PPI uses the latter definition
Pricing unit of service

- Operational definition is premium plus rate of return on investment
  
  \[ \text{Price} = \text{Premium} \times (1+r), \text{where} \ r \text{ is annual or monthly return on invested portion of premium} \]

- Variation for mutual insurance companies
  
  \[ \text{Price} = \text{Premium} \times (1+r) - \text{Dividend} \]
Market Shares
(Source: 2007 Economic Census)

Establishments
(Total=25,560)

Revenue
(Total=$952.5 billion)

- P&C: 53.4%
- H&M: 27.0%
- Title: 17.7%
- Other: 1.9%

- P&C: 52.8%
- H&M: 44.8%
- Title: 1.8%
- Other: 0.6%
Special Market Conditions or Constraints

- Nature of insurance groups
- PPI reassigns premiums based on line of insurance, not type of company, for purposes of index weighting
- Impact on sampling
- Price components available from headquarters
- Gaps filled with data from National Association of Insurance Commissioners
Classification Structures

- Use NAICS definitions
  - 524114, Direct Health & Medical Insurance Carriers
  - 524126, Direct Property & Casualty Insurance Carriers
  - Most closely compares to ISIC 6512, though US does not produce PPIs for title insurance (NAICS 524127) or other non-life direct insurance (NAICS 524128)
- US includes accidental death & dismemberment in the life insurance industry; no NAPCS codes for freight insurance or travel insurance
National accounts & measurement issues

- BEA uses a different definition in National Income and Product Accounts, consistent with 2008 SNA:

  \[ \text{Price} = \text{Premiums} \times (1+r) - \text{Claims} \]

- PPI decided not to adopt this model because our research indicated assumption of risk is appropriate definition of output for this service from the producer’s point of view.

- Publish separate index that measures only premium changes which BEA uses.
Pricing methods

- Two pricing options
  - Policy & policyholder characteristics remain “frozen” over time – use current charges applied to policy characteristics
  - Actual policy followed over time

- Most respondents price “frozen” policies but some use the alternative – use whichever is easiest for them as long as can provide info needed by US PPI
Adjusting for inflation-sensitive characteristics

- Periodic adjustments made to property & casualty “frozen” policies to hold inflation-sensitive characteristics constant
  - Valuation of property insured or risk (business assets, receipts, gross sales, payroll, etc.)
  - Valuation of repair or replacement
  - Do not adjust for liability coverages/limits; deductibles/coinsurance
Pricing characteristics

- Anniversary or renewal month
- Annual or monthly premium
- Dividend rebate
- Rate of return
- Coverage amount/limits
- Deductible/coinsurance
- Specific risks or perils covered
- Past loss experience
- Valuation of property insured or risk
Publication structure for Health & Medical

524114  Direct health and medical insurance carriers
524114P  Primary services
5241141  Medical service plans
524114101  Comprehensive medical service plans
52411410101  Group managed care medical service plans
52411410102  Group fee-for-service medical service plans
52411410103  Individual comprehensive medical service plans
524114103  Non-comprehensive medical service plans
52411410301  Dental service plans
52411410302  Supplemental Medicare service plans
52411410303  Other medical service plans
5241142  Health insurance
524114SM  Other receipts
## Publication structure for Property & Casualty

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<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>524126</td>
<td>Direct property and casualty insurance carriers</td>
</tr>
<tr>
<td>524126P</td>
<td>Primary services</td>
</tr>
<tr>
<td>5241161</td>
<td>Private passenger auto insurance</td>
</tr>
<tr>
<td>5241262</td>
<td>Homeowners insurance</td>
</tr>
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<td>Commercial auto insurance</td>
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<td>Non-auto liability insurance</td>
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<tr>
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<td>Product liability and other non-auto liability insurance</td>
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<td>5241267</td>
<td>Other property and casualty insurance</td>
</tr>
<tr>
<td>524126SM</td>
<td>Other receipts</td>
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</tbody>
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Critical is ability to identify and adjust for changes in risk

Suitable cost data available for changes in explicit endogenous risk factors such as removal of lifetime maximums for a health insurance policy

Changes that go beyond scope of policy negotiations such as increased incidence of theft or severe flu season require outside data to distinguish short-term vs. long-term changes in risk
QA for Private Passenger Auto Insurance

- Assess risk change with valuations from the Insurance Services Office (ISO)
- ISO assigns autos to risk categories called “symbol groups”
- PPI obtains value of risk change for every auto for which we have a policy being priced in the index; we use values to explicitly quality adjust when an auto moves into a different symbol group
Quality adjustment: New item bias

- Item bias concern especially prevalent for “frozen” pricing method as policy may no longer be representative over time
- Can also occur when following an actual policy if general population has changed preferences or policy represents small portion of company’s business
- Item bias minimized by more frequent resampling; capture of coverage changes during repricing
Results I: Property & Casualty

- 524126 Direct property and casualty insurance carriers
- 5241261 Private passenger auto insurance
- 5241262 Homeowner's insurance
Results II: Health & Medical

- 524114 Direct health and medical insurance carriers
- 5241141 Medical service plans
- 5241142 Health insurance
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