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**Room Document**

**Sampling general-insurance policies for the CPI**

**Stephen Frost  
Macroeconomic Research Section**

## **Abstract**

This paper presents a progress report on ABS's new approach to measuring price changes in general insurance using a sample of frozen policies.

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## **1. INTRODUCTION**

For many years now ABS's policy is to exploit as far as possible electronic databases of administrative data instead of directly running sample surveys. Our objectives, as demonstrated in this case, are to reduce collection costs and simultaneously improve the quality of the estimates.

The Australian CPI is based on an acquisitions approach. The weight of general insurance is included on a net basis (i.e. gross written premiums less claims) but price change is measured by the change in gross premiums only as a proxy for the net concept. However, the ABS is investigating whether it is possible to measure price change in the national accounting net concept known as the Insurance Service Charge.

In the past the ABS has collected prices for general insurance by phone, personal visit, and Internet. But the trouble with this approach is that it is very hard to collect a large enough sample using these channels. And particularly over the phone it is not clear that we are pricing to constant quality. Typically the call-centre operators ask only a few questions before quoting a price yet we know that there are many more variables than this in the companies' pricing algorithms. This implies that assumptions are being made in the background, and we are concerned that the assumptions vary depending on the operator that we get each time. Also the prices received during this process tend to be volatile and are hard to verify.

## **2. THE NEW METHOD**

As a consequence of these reservations the ABS has developed a new way of pricing general-insurance services for the CPI. We start with confidentialised samples of policies from insurers' databases. These are live policies taken out by households. We turn these real policies into statistical constructs by freezing all the variables (except the sums insured which we escalate by a four-quarter moving-average of the CPI to preserve the underlying quantities implicit in the values). So, for example, if a policy for motor vehicle insurance has a teenaged driver listed on the policy, that sampled policy will continue to have that driver and only that driver listed on it for the life of the sample irrespective of what subsequently occurs in the insurer's database.

After adjusting the sums insured we return the file of sampled policies to the original insurer for re-pricing using its premium calculator. These simulation programs are often coded in SAS which is very convenient for us as we ourselves use a SAS program to calculate the price changes, and using the same software in both organisations makes file transfers very easy. A simplified example of the new method is shown in the appendix.

### **3. RISKS OF USING THE NEW METHOD**

The main risk is that the companies won't have the time to run the adjusted files of sampled policies through their premium calculators in time for production. This risk is minimised by working with several providers and using standard imputation techniques should a company fail us.

There is also a slight risk of moral hazard, namely that the companies could falsify the results to make themselves look good. But we always audit the results using press reports and publicly available price information as well as by discussing them with knowledgeable people within each company. This has given us an insight into the workings of large insurance enterprises, and makes falsification by any company even more unlikely.

### **4. PRICING TO CONSTANT QUALITY**

As the variables in the policies have been turned into constants we can simply difference the premiums that we calculate for each period to get the change in price. Of course, this is only valid if there is no significant change in the conditions of the policy as set out in the legal contract. We have discussed this with the industry and their view is that although there are sometimes step changes (such as the change from indemnity cover to replacement cover) these are fairly rare. For the most part Australian insurance cover has not changed much in the last thirty years. Of course, there are many marketing campaigns in the press and on TV but the policy enhancements offered are mostly of slight importance. Nevertheless it will be wise to keep in close contact with the industry to ensure that large changes in conditions do not slip past us unnoticed.

### **5. CONCLUSION**

The ABS concludes that this is a change for the better, and we are presently extending policy sampling across the major general insurers in Australia.

**APPENDIX ONE: WORKED EXAMPLE – MOTOR INSURANCE\***

1. ABS obtains a sample of policies from the insurance company. An example of such a sample is set out below. These policies are actual policies taken out by households.

Sum insured	Year of manufacture	Vehicle age	Vehicle value	Unique ID
\$ 15,600	2002	7	\$ 15,600	cmpny_MC_ADE_001
\$ 22,400	2008	1	\$ 22,400	cmpny_MC_ADE_002
\$ 7,050	1999	11	\$ 7,050	cmpny_MC_ADE_003
\$ 3,100	1996	14	\$ 3,100	cmpny_MC_ADE_004
\$ 23,600	2006	3	\$ 23,600	cmpny_MC_ADE_005
\$ 23,330	2010	0	\$ 23,330	cmpny_MC_ADE_006
\$ 8,600	2002	8	\$ 8,600	cmpny_MC_ADE_007
\$ 32,450	2006	4	\$ 32,450	cmpny_MC_ADE_008
\$ 24,850	2008	2	\$ 24,850	cmpny_MC_ADE_009

2. Each quarter the sum insured is escalated by a four-quarter moving-average of the CPI. All other variables (columns) are held constant so that we are pricing to constant quality. An example of escalated policies is set out below.

Sum insured	Year of manufacture	Vehicle age	Vehicle value	Unique ID
\$ 15,811	2002	7	\$ 15,811	cmpny_MC_ADE_001
\$ 22,703	2008	1	\$ 22,703	cmpny_MC_ADE_002
\$ 7,145	1999	11	\$ 7,145	cmpny_MC_ADE_003
\$ 3,142	1996	14	\$ 3,142	cmpny_MC_ADE_004
\$ 23,919	2006	3	\$ 23,919	cmpny_MC_ADE_005
\$ 23,645	2010	0	\$ 23,645	cmpny_MC_ADE_006
\$ 8,716	2002	8	\$ 8,716	cmpny_MC_ADE_007
\$ 32,888	2006	4	\$ 32,888	cmpny_MC_ADE_008
\$ 25,186	2008	2	\$ 25,186	cmpny_MC_ADE_009

\* These examples have been prepared by Paul Quach of ABS's Macroeconomics Research Section

- These escalated policies are sent to the respondent insurer for them to re-price using their premium calculator. An example of re-priced policies is shown below.

Premium	Unique ID	City
\$ 1,373.96	cmpny_MC_ADE_001	Adelaide
\$ 924.36	cmpny_MC_ADE_002	Adelaide
\$ 794.06	cmpny_MC_ADE_003	Adelaide
\$ 433.24	cmpny_MC_ADE_004	Adelaide
\$ 805.67	cmpny_MC_ADE_005	Adelaide
\$ 694.90	cmpny_MC_ADE_006	Adelaide
\$ 791.14	cmpny_MC_ADE_007	Adelaide
\$ 1,040.34	cmpny_MC_ADE_008	Adelaide
\$ 640.51	cmpny_MC_ADE_009	Adelaide

- Once the ABS receives back these re-priced policies, we calculate the price movement between the current quarter and the previous quarter using geometric means. This is done for each company and city combination for which the ABS has sampled policies. An example of the final output follows.

Dec 10 to Mar 11	Dec 10	Mar 11
1.009203503	614.3141141	619.96796

- The results are then audited by discussing them with knowledgeable people within the companies.