

## **Does the reason for buying health insurance influence behaviour?**

Rosalie Viney<sup>1</sup>, Elizabeth Savage<sup>1</sup> and Denzil Fiebig<sup>1,2</sup>

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1. Centre for Health Economics Research and Evaluation  
Faculty of Business  
University of Technology, Sydney
2. School of Economics  
Faculty of Economics and Commerce  
University of NSW

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### **Abstract**

Following the implementation of a range of government measures to increase private health insurance coverage in Australia, the 2001 National Health Survey asked respondents not only about their insurance status, but also about their reasons for having or not having health insurance. The most common reason given for having health insurance was 'security/peace of mind' but other reasons included 'choice of doctor', 'shorter wait for treatment', 'lifetime cover/avoid the surcharge', 'to gain government benefits/avoid the Medicare surcharge'. This study uses these data to identify different categories (types) of consumer in terms of their reasons for having health insurance. Four broad types of consumer are identified: those who purchase health insurance for security reasons, for increased choice, for financial reasons, and for health reasons. We find that, controlling for health and socio-economic status, insurance type is significantly associated with hospital utilization, particularly the probability of being admitted as a public or private patient. We also investigate whether insurance type explains timing of insurance purchase.

## **1 Introduction**

In the past decade, Australia has undergone a series of policy changes in relation to private health insurance, aimed at increasing the level of private health insurance coverage. These policy changes have been widely documented (Hall and Savage, 2005; Hall et al, 1999; Butler; 2002). They were introduced in response to a progressive decline in private health insurance over the period since the introduction of Medicare, and at least in part because of a perception that this decline placed additional pressure on the public hospital system. Their overall impact has been to increase the level of private health (hospital) insurance from just over 30% of the population in December 1998 to 43% of the population in December 2000, although, as has been discussed elsewhere, the individual impact of each policy change differed considerably, and there has since been some evidence of a return to the previous trend of declining private cover (Hall and Savage, 2005; Butler, 2002).

The inter-relationship between private health insurance cover and hospital utilisation and expenditure is complex. Private health insurance in Australia is supplementary cover. Under Medicare, all Australian residents are entitled to free public hospital treatment, regardless of whether they have private health insurance. Private health insurance covers treatment in a private hospital or a private patient in a public hospital. There are generally significant out-of-pocket costs associated with private treatment, creating disincentives to use private treatment even for those with private health insurance. The policy changes introduced in the last decade have made this even more complex. The initial policy, introduced in 1997, which involved a combination of tax penalties for higher income individuals without private health insurance and tax subsidies for low income individuals who purchased private health insurance, was replaced in 1998 by a non-means tested 30% rebate on private health insurance (the tax penalties to higher income individuals remained, and in fact were extended to cover new policies with high front end deductibles in 2000). The combined effect of the tax penalties and subsidies means that for high income individuals the net premium may be negative. Thus, private health insurance purchase may not be related to expectations of use of hospital services (particularly private hospital services).

The final policy change, the introduction of age based risk rating or ‘lifetime health cover’, allowing firms to vary premiums with age of entry (which was accompanied by an extensive advertising campaign with the slogan “run for cover”), appeared to have the most significant impact on cover, although it is difficult to disentangle the effect of the different policy changes within aggregate data.

Identifying the impact of the policy changes on private health insurance cover is made more complex by the fact that there is significant churning in the market, in terms of individuals who enter and exit the PHI market in response to incentives they face at particular points in time. The current policy approach appears to rely on relatively simple models of the relationships between health insurance coverage, public and private hospital utilisation and health expenditure, which do not capture the complexity of the choices facing individuals. For example, after the introduction of Medicare, private hospital usage grew more rapidly than public hospital usage. In the ten years to 1995-96, there was an 81% increase in private hospital usage compared to a 46% rise for public hospitals. Although the rate of PHI coverage fell from 50% in 1984 to just over 30% in 1998, the share of hospital expenditure covered by private health insurance remained relatively constant.

While a link exists between PHI coverage and the demand for health services, the health insurance premium, which has been the focus of government policy, is a relatively small component of the overall price. The choice of whether to insure depends as well on the probability distribution over health states, the ‘net’ prices of the various hospital options, the waiting time for free treatment in a public hospital, and other socio-economic variables. The insurance choice must be made before the health state is realised. The choice of type of hospital, patient status and the quantity of hospital services consumed are subsequent decisions that do not depend solely on insurance status.

There is considerable evidence of unexplained heterogeneity of preferences among the privately insured population. For example, a robust finding in empirical studies of the demand for private health insurance is that individuals with higher self-assessed health status are more likely to have private health insurance, controlling for other covariates such as income, education, age and the existence of co-morbidities (Doiron

et al, 2005; Barrett and Conlon, 2003; Shmueli, 2001; Harmon and Nolan; 2001). Moreover, while a higher probability of having private health insurance is positively associated with variables such as income, education and health status, a number of studies have found that variables such as voting preferences and attitudes to public/private cover are also significantly correlated with insurance cover (Propper, 1993; 2000; Burchardt and Propper, 1999, Harmon and Nolan, 2001).

A number of other studies have used attitudinal variables to model heterogeneity of preferences. Harris and Keane (1999) found that inclusion of attitudinal variables (stated preferences expressed as responses to attitudinal questions about the importance of particular attributes) substantially improved model fit in an analysis of choice of health care plans in the United States. Ahn, de la Rica and Ugidos (1999) found that the probability of finding a job was significantly higher among unemployed workers with positive migration attitudes, but that duration of unemployment was not a significant of migration attitude, even after controlling for unobserved fixed individual heterogeneity. Hersch et al (1995) found that proxy variables for risk attitude (smoking and seat-belt use) were significant in explaining the compensating differential in the wage-risk trade-off for risky jobs. Darnhofer, Schneeberger and Freyer (2005) examined willingness of farmers in Austria to convert to organic farming. They identified five types of farmers, characterised by their farming strategies and values, the “committed conventional”, “pragmatic conventional”, “environment conscious but not organic”, “pragmatic organic” and “committed organic”. This study illustrates the importance of taking into account heterogeneity in farmers’ attitudes, preferences and goals in understanding choice of farming method.

Heterogeneity of preferences is likely to be important not just in determining the uptake of private health insurance, but also the impact of changes in private health insurance on the use of private treatment. To develop a better understanding of the relationship between health insurance cover and health care utilization and expenditure in Australia, it is important to model not just the complexity of incentives facing individuals (see for example Ellis and Savage, 2005), but also to capture heterogeneity of preferences. Studies in other countries provide support for the use of attitudinal variables to explain demand for health insurance and hospital utilization

(Harmon and Nolan, 2001; Propper, 1989; 1993). However, it is rarely possible to combine attitudinal data with other relevant sociodemographic variables at the individual level.

While not directly asking respondents about their attitudes to public and private treatment or to private health insurance, data from the 2001 ABS National Health Survey provide the opportunity to examine this issue in the Australian setting, in the context of the substantial changes to private health insurance policy that have taken place over the last decade. Within the survey, respondents aged 15 or over were asked to indicate their reasons for purchasing or not purchasing private health insurance. This study uses these data to identify different categories (types) of consumer in terms of their reasons for having health insurance. We investigate whether identification of type (in terms of reasons for purchasing insurance) improves the modeling of unexplained heterogeneity in preferences for private health insurance, and whether insurance ‘type’ explains use of the health system and timing of insurance purchase.

In Section 2 of the paper we describe the key data from the National Health Survey and explain how these are used to identify types. Section 3 presents the econometric analysis and discusses the findings.

## **2 National Health Survey Data and Identification of Types**

The 2001 ABS National Health Survey is part of a series of national surveys of the health status and health care utilization of the Australian population (previous studies were conducted in 1977-78; 1983; 1989-90 and 1995). It involved a representative sample of 17,918 private dwellings across Australia, with information collected on one adult from each household, all children aged 0-6 years and one child aged 7-17 years, including data on health status, health related behaviours, use of health services and demographic and socio-demographic characteristics (26,862 respondents in total). In this analysis we have used the CD-ROM version of the data set, in which some variables are suppressed. The sample was restricted to respondents over the age of 18, giving 17694 observations.

All respondents aged 15 or over who indicated they had private health insurance cover were asked the question “What are all the reasons you are covered by insurance?”. Respondents could indicate more than one reason. A corresponding question was asked of respondents who indicated they did not currently have private health insurance cover. Table 1 summarises the overall frequency of reasons for having insurance cover among the 8328 respondents who had private hospital cover.

These data provide valuable information about reasons for purchasing private health insurance. There are a number of ways that they could be included in analysis. One possibility is to include each reason as an explanatory variable. However, as can be observed from Table 1, there is overlap and ambiguity in the description of reasons. Therefore a second possible approach that is potentially more useful for econometric analysis is to group reasons that are similar, thus defining a smaller set of dummy variables. An issue with both of these approaches is that respondents could provide more than one reason. The average number of reasons per respondent is 1.9. Therefore single reasons do not in themselves identify types. Table 2 provides a summary of responses in terms of the number of reasons given per respondent.

Thus, a third approach is to use the reasons to identify “types”, that is a set of mutually exclusive categories of reasons for purchasing insurance, such that each respondent could be assigned to one category of reason (a preference ‘type’). This allows one dummy variable to be defined for each preference type, which potentially facilitates interpretation of parameter estimates. This was our preferred approach.

The identification of types was based on two stages. The first stage involved forming judgments about which reasons are related in terms of preferences. A complexity that arises when individuals are asked to answer all the reasons for making a particular consumption decision is that it is not possible to determine whether the respondent sees each reason he/she ticks as a separate reason for the decision (relating to a different objective) or whether he/she ticks all reasons that are close approximations to the underlying reason. Further, it is not possible to identify whether there is a primary reason and others are secondary reasons. For example, although reasons B and H relate to different aspects of the financial cost of private health insurance, a respondent who is motivated by financial factors may tick both of these, and it is not

possible to determine whether both are equally important, or whether there is one primary reason. Therefore in the first stage we attempted to group the reasons into related categories, that is, identify which reasons appear to relate to similar potential objectives in the respondent's utility function. We grouped the reasons into five broad categories as summarised in Table 3.

Reasons C, D and F were judged to relate to facilitating access to choice of private treatment. Reasons B, E, H and I were judged to relate to reducing the financial costs of health insurance/health care. Reasons J and K were judged to relate to concerns about health status and the role of private health insurance in facilitating access to care. Reasons A and G were judged to relate to underlying risk aversion. Clearly these categories are based on our subjective assessments of what are related reasons, and may be subject to debate. These groupings of reasons formed the basis for the smaller set of dummy variables to be included in the analysis described below.

For respondents who give only one reason for purchasing health insurance (46%), allocation of reasons to categories or types is straightforward, and the reason itself could be used in empirical analysis. Just over 44% of respondents gave two or three reasons, with a small minority giving more than 3 reasons. The second stage was to determine which reasons were associated with each other empirically. We focused on respondents who had identified up to 3 reasons (90% of the sample), and for each reason we calculated frequencies with which that reason was combined with each one or two other reasons. Examples are illustrated in Appendix A.

From this descriptive analysis, two features emerged. First, there is support for the categories we identified. This is illustrated in Table 4<sup>1</sup>, which summarises the co-occurrence of each reason for the 2703 respondents who gave exactly two reasons. Almost half (1235) of these respondents gave 'Security/protection/peace of mind' as one reason. Although there is a spread of other reasons with which this is combined, the highest frequency is for "Always had it" (228 responses). The next most common reason is "Choice of doctor" (470 responses) and it is most commonly associated with

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<sup>1</sup> Note that the sample for Table 4 included dependents, and hence the frequencies are not the same as above. However, the conclusions are similar.



“allow treatment as private patient in hospital” (217 responses) and “shorter wait for treatment” (149 responses).

However, the second feature that emerges is that it is clear that there is a spread of responses, and that it is not empirically supportable to identify 5 unique types of consumers. Respondents often give both a security type reason and a financial type reason for having insurance. We therefore examined the co-occurrence of reasons for each respondent to assign them to a ‘single type’ category or a ‘combination type’ category. A ‘single type’ respondent is a respondent who gives only one reason, or whose two or more reasons belong to the same category identified above (Security, Choice, Financial, Health). A ‘combination type’ respondent is a respondent whose two or more reasons come from different categories. For this purpose, reason L (other, not specified) was not assigned to any category such that if any reason given by a respondent was reason L, the category was determined by the classification of the other reasons. The exception to this was respondents who ticked only reason L.

Table 5 summarises the final set of categories identified. More than half of the sample (56.1%) can be grouped into a single type using the types we identified, with the majority of these being in the “security” type (25.6%). A significant proportion (15%) identified financial reasons only for having private health insurance. In addition, when the combination types are examined as well, it is clear that there are a large number of respondents who identified financial reasons. The “single types” and “2-type” respondents cover 87.4% of the population.

### **3 Models and Results**

We examine the impact of reasons for private health insurance cover on probability of admission to hospital. Multinomial logit models are estimated, where the dependent variable is admission status, with three levels: not admitted, admitted as a Medicare patient and admitted as a private patient. The base category is not admitted. The sample was further restricted by dropping 31 individuals for whom admission status (Medicare or private) is not known. Three models are estimated. Model 1 includes sociodemographic controls and a dummy for private health (hospital) insurance status. Descriptive statistics for the sociodemographic controls are presented in Table 6. In

Models 2 and 3 the insured are decomposed by creating dummies for insurance ‘types’. In Model 2 there are 6 dummies for insurance status: a dummy for each of the ‘single’ types (choice, financial, security and health), a dummy for the ‘other’ category (those who ticked only ‘other’) and a dummy for all ‘combination’ types. In Model 3, the ‘combination types’ are further decomposed into separate dummies for each type, thus creating an additional 10 insurance dummies.

Table 7 presents the likelihood ratio tests comparing Models 1-3. From comparison of the models it is evident that inclusion of ‘single’ types significantly improves the fit of the model. Comparison of Models 2 and 3 shows that when the remaining insured group (those who could not be grouped into a single type) are further broken down according to their combination types, the fit of the model is again improved. This suggests that identification of the reasons for insurance adds to our understanding of the choice between public and private admission, by allowing us to model better the underlying heterogeneity in the insured population.

Table 8 presents the results for Model 3. Results are reported as relative risk ratios, that is the impact of each variable on the odds ratio. From Table 8 it can be seen that the sociodemographic variables have expected signs. The omitted categories are uninsured, male, aged less than 30, born in Australia, no post-school qualifications, single, unemployed, gross income unit income less than \$400, and with excellent self assessed health. The sociodemographic controls are robust across the different specifications of the model.

The addition of the ‘type’ variables provides valuable information about the underlying heterogeneity among the insured. In Model 1 which included private insurance cover and sociodemographic controls, the relative risk ratio (relative to uninsured) was 0.36 ( $p=0.000$ ) for admission as a Medicare patient and 8.35 ( $p=0.000$ ) for admission as a private patient. Thus, as would be expected, having private hospital insurance significantly increases the probability of being admitted as a private patient rather than a public patient. However, when the insured are further decomposed into types in Models 2 and 3, while the underlying pattern that those with insurance are more likely to be admitted as private patients remains, it is evident that there is considerable variation in probability of admission across the types. Those who

were classified as a “choice” type, either singly or in combination with another type, typically have much higher probabilities of admission as a private patient than other types. The probability of admission as a private patient is lowest among those who were classified as “financial”, “financial/health” and “financial/security”. This suggests that there is a group of consumers whose underlying reasons for having private health insurance relate to factors other than preference for treatment as a private patient, and that their choice behaviour in relation to hospital admission is related to this. Figure 1 depicts the relative risk ratios by type graphically, and Figure 2 presents the average predicted probability of admission by types. For example, for those classified as “financial” (single type), there is little difference in the average predicted probability of admission as a Medicare or a private patient. By contrast for those who are “choice/health” (combination type) the difference between their probability as of admission as a private patient and as a public patient is much larger.

Figure 3 presents simulated admission probabilities by patient status for each type. The simulations are generated by assigning the type to each observation, while retaining the individual values for all other variables.

Given that the inclusion of information about the reasons for insurance significantly improves the modeling of probability of admission to hospital, it is of interest to identify whether the underlying differences between the insurance types can be explained. The major changes to policy in relation to health insurance have changed the incentives for uptake of private health insurance, such that for some individuals, the price of private health insurance is negative. The introduction of lifetime health cover may also have changed the threshold in relation to risk aversion as an underlying reason for private health insurance. Some evidence in relation to these factors is found by examining the distribution of duration of private health insurance cover across the insurance types, as presented in Figure 4. As would be expected, the majority of the insured have been insured for more than 5 years. However, this varies considerably across the types. In particular, those who indicated choice reasons (either singly or in combination) have generally had insurance for more than 5 years, suggesting an underlying preference for access to private treatment (or underlying risk aversion). By contrast, those who indicated financial reasons (either singly or in combination) are much more likely to have been insured for less than 2 years, which

corresponds in these data with the timing of the introduction of the private health insurance rebate. The exception is when financial reasons are combined with choice reasons.

We examine the impact of type on time in health insurance cover, for the insured subsample. Multinomial logit models are estimated, where the dependent variable is time in cover, with four categories: less than one year, one to less than two years, two to less than five years and five or more years. The base category is five or more years. Models are estimated with and without controls. Table 9 presents the relative risk ratios for the model including controls, and Figure 5 summarises the results for each type, for the models with and without controls. It can be seen that those insurance duration varies with type. In particular, financial types (single and combination) have a significantly higher probability of shorter insurance durations (less than 2 years).

**Table 1: Overall frequency of reasons for private health insurance cover among respondents with private hospital cover**

<b>Rank</b>	<b>Reason for private health insurance cover</b>	<b>Frequency</b>	<b>%</b>	<b>Cum %</b>
1	Security / protection peace of mind	3859	21.8%	21.8%
2	Allow treatment as private patient in hospital	2132	12.1%	33.9%
3	Choice of doctor	2117	12.0%	45.8%
4	Always had it / parent pay it / condition of job	1891	10.7%	56.5%
5	Shorter wait for treatment / concern over public hospital waiting lists	1880	10.6%	67.1%
6	Provides benefits for ancillary services / extras	1461	8.3%	75.4%
7	To gain government benefits / avoid extra Medicare levy	933	5.3%	80.7%
8	Lifetime cover / avoid age surcharge	916	5.2%	85.9%
9	Other reason	780	4.4%	90.3%
10	Elderly / getting older / likely to need treatment	631	3.6%	93.8%
11	Other financial reasons	555	3.1%	97.0%
12	Has other conditions that requires treatment	537	3.0%	100.0%
	<b>Total</b>	<b>17692</b>	<b>100.0%</b>	

**Table 2: Number of reasons for private health insurance cover among respondents with private hospital cover**

<b>Number of reasons</b>	<b>Number of observations</b>	<b>% of the population</b>	<b>Cumulative %</b>
1	3641	43.7%	43.7%
2	2557	30.7%	74.4%
3	1261	15.1%	89.6%
4	535	6.4%	96.0%
5	209	2.5%	98.5%
6	77	0.9%	99.4%
7	32	0.4%	99.8%
8	13	0.2%	100.0%
9 or more	4	0.0%	100.0%
<b>Total</b>	<b>8328</b>	<b>100.0%</b>	

**Table 3 : Categories of reasons for purchasing private health insurance**

<b>Category</b>	<b>Reason for private health insurance cover</b>	<b>Label</b>
<b>Choice</b>	Choice of doctor	C
	Allow treatment as private patient in hospital	D
	Shorter wait for treatment /concern over public hospital waiting lists	F
<b>Financial</b>	Lifetime cover / avoid age surcharge	B
	Provides benefits for ancillary services / extras	E
	To gain government benefits / avoid extra Medicare levy	H
	Other financial reasons	I
<b>Health</b>	Has other conditions that requires treatment	J
	Elderly / getting older / likely to need treatment	K
<b>Security</b>	Security / protection peace of mind	A
	Always had it / parent pay it / condition of job	G
<b>Other</b>	Other reason	L

**Table 4: Frequency of co-occurrence of reasons for respondents providing two reasons**

	Sec	Fin	Choice	Choice	Fin	Choice	Sec	Fin	Fin	Health	Health	Other	Total	Percentage
	A	B	C	D	E	F	G	H	I	J	K	L		
A	0	76	146	111	155	155	228	69	86	55	89	65	1235	45.69%
B		0	10	9	29	15	25	45	17	10	21	25	206	7.62%
C			0	217	37	149	20	6	8	9	9	15	470	17.39%
D				0	80	99	30	9	11	11	17	17	274	10.14%
E					0	32	30	39	20	24	12	22	179	6.62%
F						0	29	10	20	16	24	20	119	4.40%
G							0	9	6	25	37	30	107	3.96%
H								0	15	7	19	20	61	2.26%
I									0	6	6	10	22	0.81%
J										0	17	4	21	0.78%
K											0	9	9	0.33%
L												0	0	0.00%
Total	0	76	156	337	301	450	362	187	183	163	251	237	2703	100.00%
Percentage	0.00%	2.81%	5.77%	12.47%	11.14%	16.65%	13.39%	6.92%	6.77%	6.03%	9.29%	8.77%	100.00%	

**Table 5: Types identified by reasons**

	<b>Type</b>	<b>Frequency</b>	<b>Percentage</b>
Single Type	Choice	1124	13.5%
	Financial	1247	15.0%
	Health	254	3.0%
	Security	2048	24.6%
Combination Type (2 categories)	Choice/Financial	547	6.6%
	Choice/Health	139	1.7%
	Choice/Security	997	12.0%
	Financial/Health	125	1.5%
	Financial/Security	538	6.5%
	Health/Security	251	3.0%
Combination Type (3 categories)	Choice/Financial/Health	65	0.8%
	Choice/Financial/Security	507	6.1%
	Choice/Health/Security	106	1.3%
	Financial/Health/Security	68	0.8%
Other Types	All reasons	77	0.9%
	Other reason	235	2.8%
<b>Total</b>		<b>8328</b>	<b>100%</b>



**Table 6: Means of Sociodemographic Controls**

<b>Variable</b>	<b>Mean</b>	<b>SD</b>
private insurance	0.47	0.50
age30s	0.22	0.41
age40s	0.21	0.41
age50s	0.15	0.36
age60s	0.11	0.31
age70over	0.14	0.34
female	0.55	0.50
bornOther	0.27	0.44
diploma	0.37	0.48
degree	0.16	0.37
couple	0.29	0.46
sole parent	0.06	0.24
couple with deps	0.26	0.44
full time emp	0.43	0.50
part time emp	0.17	0.37
not in LF	0.37	0.48
\$400 to 599	0.11	0.32
\$600 to 799	0.10	0.30
\$800 to 999	0.08	0.28
\$1000 to 1499	0.14	0.35
\$1500 to 1999	0.07	0.26
\$2000 to 2499	0.03	0.16
\$2500+	0.03	0.17
income not stated	0.18	0.38
Very Good	0.32	0.47
Good	0.31	0.46
Fair	0.15	0.35
Poor	0.05	0.22
Number LTC	2.81	1.71

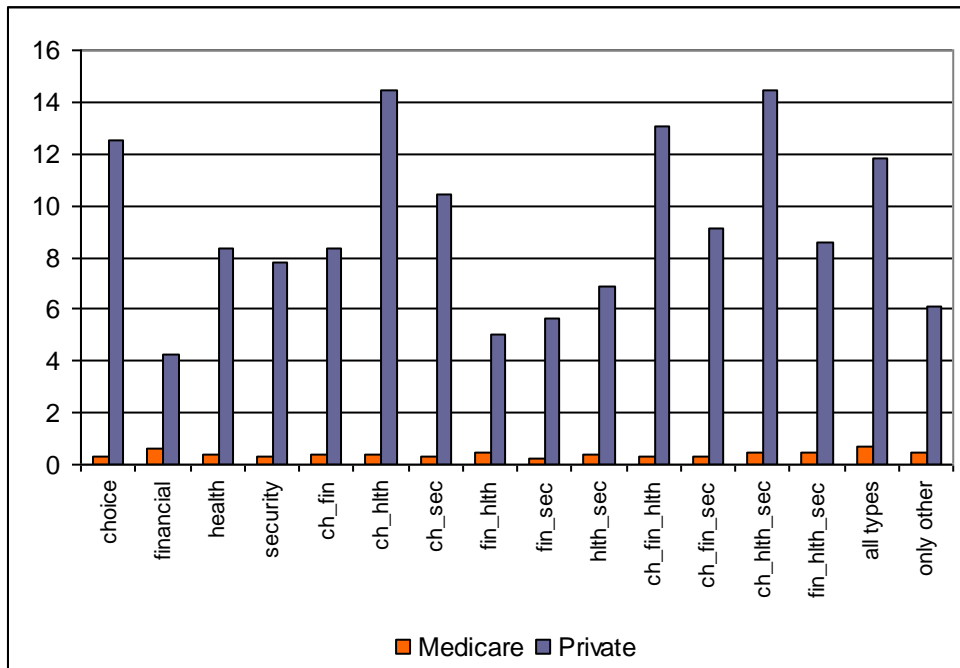
**Table 7: Likelihood ratio tests for Models 1-3**

Model	Description	LogL	LR test statistic	Number explanatory variables	DF	5% Critical chi-sq
1	Insurance + controls	-7869.69	1065.91	60	.	.
2	Single types + controls	-7837.53	64.33	70	10	18.31
3	All types + controls	-7820.37	34.32	90	20	31.41

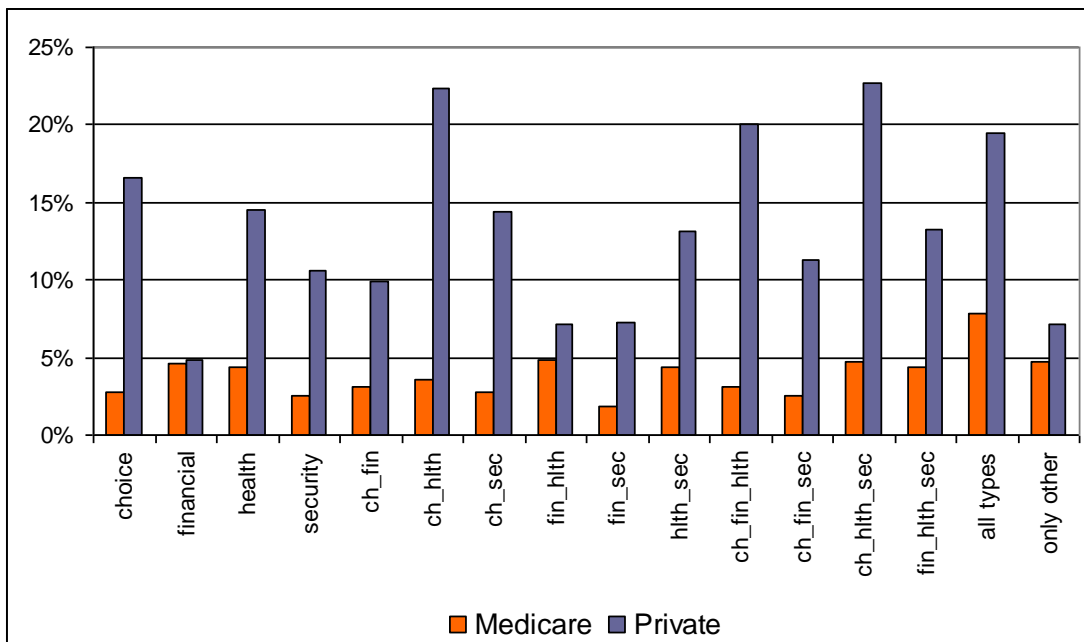
**Table 8: Multinomial Logit Estimates for Probability of Admission (Model 3)**

Variable	Medicare			Private		
	Relative risk ratio	Std. Err.	P> z	Relative risk ratio	Std. Err.	P> z
Choice	<b>0.319</b>	0.060	0.000	<b>12.088</b>	1.472	0.000
Financial	<b>0.585</b>	0.086	0.000	<b>4.104</b>	0.670	0.000
Health	<b>0.395</b>	0.125	0.003	<b>8.050</b>	1.640	0.000
Security	<b>0.286</b>	0.042	0.000	<b>7.532</b>	0.860	0.000
ch_fin	<b>0.377</b>	0.096	0.000	<b>8.085</b>	1.403	0.000
ch_hlth	<b>0.373</b>	0.173	0.034	<b>14.252</b>	3.295	0.000
ch_sec	<b>0.310</b>	0.062	0.000	<b>10.016</b>	1.295	0.000
fin_hlth	0.493	0.211	0.099	<b>4.675</b>	1.712	0.000
fin_sec	<b>0.205</b>	0.067	0.000	<b>5.402</b>	1.037	0.000
hlth_sec	<b>0.386</b>	0.122	0.003	<b>6.603</b>	1.405	0.000
ch_fin_hlth	0.306	0.223	0.104	<b>12.917</b>	4.337	0.000
ch_fin_sec	<b>0.301</b>	0.087	0.000	<b>8.756</b>	1.504	0.000
ch_hlth_sec	0.478	0.224	0.115	<b>13.746</b>	3.561	0.000
fin_hlth_sec	0.421	0.253	0.149	<b>8.119</b>	3.088	0.000
all types	0.728	0.321	0.471	<b>11.529</b>	3.625	0.000
only other	<b>0.490</b>	0.143	0.014	<b>5.968</b>	1.502	0.000
age30s	<b>0.596</b>	0.055	0.000	0.924	0.122	0.548
age40s	<b>0.396</b>	0.040	0.000	<b>0.596</b>	0.082	0.000
age50s	<b>0.408</b>	0.047	0.000	<b>0.673</b>	0.094	0.005
age60s	<b>0.478</b>	0.059	0.000	0.867	0.135	0.361
age70over	<b>0.493</b>	0.058	0.000	<b>1.363</b>	0.208	0.043
Female	<b>1.181</b>	0.076	0.010	1.043	0.077	0.565
bornOther	0.999	0.066	0.982	<b>0.810</b>	0.064	0.008
Diploma	<b>1.221</b>	0.078	0.002	1.084	0.081	0.283
Degree	1.046	0.110	0.669	0.993	0.099	0.945
Couple	0.961	0.077	0.620	0.918	0.079	0.321
sole parent	1.213	0.150	0.119	1.108	0.219	0.606
couple with deps	<b>1.738</b>	0.163	0.000	1.186	0.130	0.120
full time emp	0.852	0.139	0.326	0.748	0.198	0.274
part time emp	0.854	0.144	0.351	0.952	0.258	0.855
not in LF	<b>1.635</b>	0.258	0.002	1.181	0.317	0.535
\$400 to 599	1.119	0.109	0.250	<b>1.357</b>	0.171	0.015
\$600 to 799	1.173	0.134	0.161	<b>1.463</b>	0.198	0.005
\$800 to 999	1.034	0.141	0.806	<b>1.337</b>	0.197	0.048
\$1000 to 1499	0.938	0.122	0.625	<b>1.412</b>	0.194	0.012
\$1500 to 1999	1.007	0.177	0.971	<b>1.533</b>	0.244	0.007
\$2000 to 2499	0.796	0.237	0.445	1.188	0.269	0.446
\$2500+	0.677	0.223	0.236	<b>1.693</b>	0.335	0.008
income not stated	0.855	0.081	0.097	1.237	0.139	0.059
Very Good	1.239	0.136	0.052	0.917	0.100	0.427
Good	<b>1.666</b>	0.180	0.000	<b>1.275</b>	0.138	0.025
Fair	<b>2.439</b>	0.288	0.000	<b>2.057</b>	0.253	0.000
Poor	<b>4.819</b>	0.648	0.000	<b>3.776</b>	0.595	0.000
Number LTC	<b>1.131</b>	0.024	0.000	<b>1.152</b>	0.029	0.000

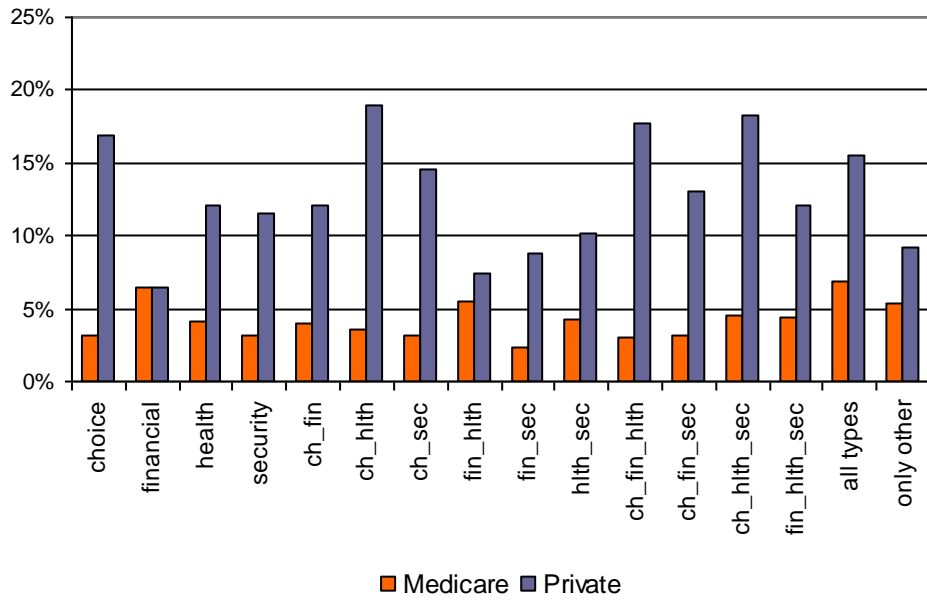
**Figure 1: Relative risk ratio by patient status**



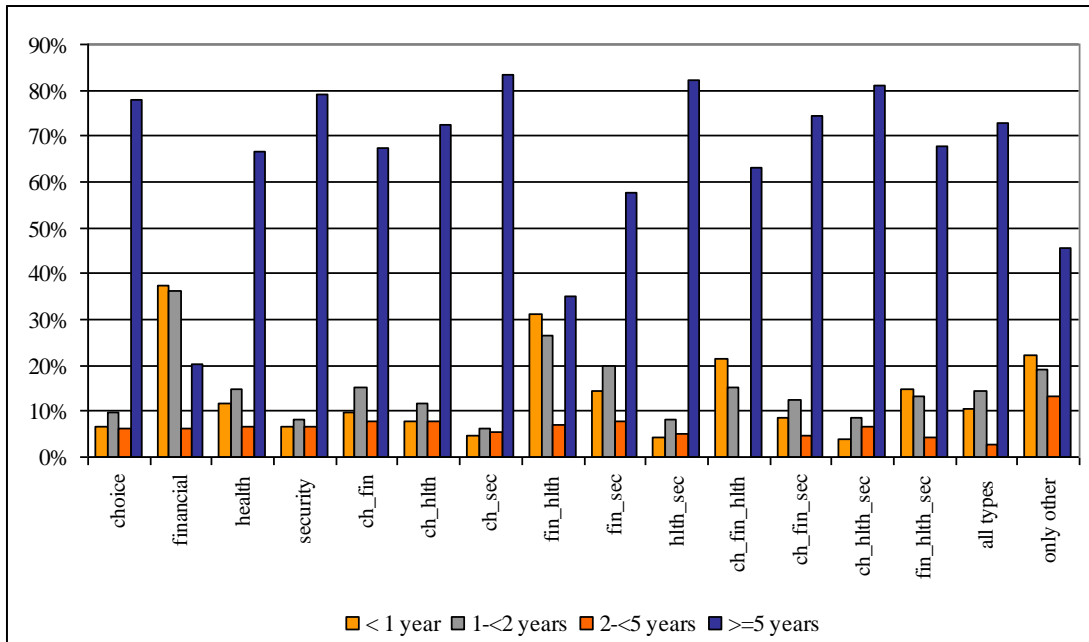
**Figure 2: Average predicted probability of admission by type**



**Figure 3: Simulated probability of admission by type and patient status**



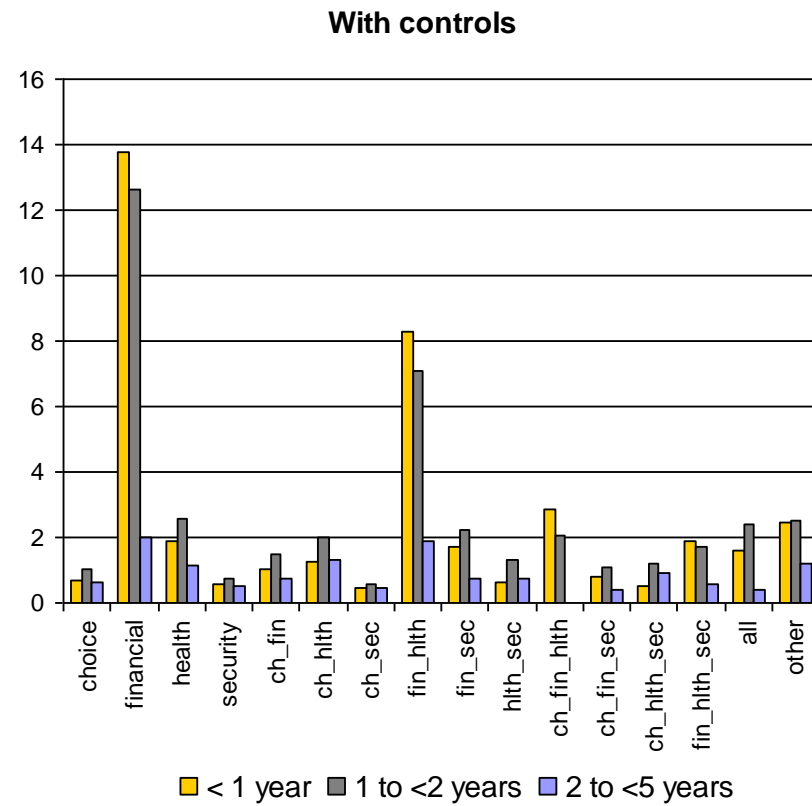
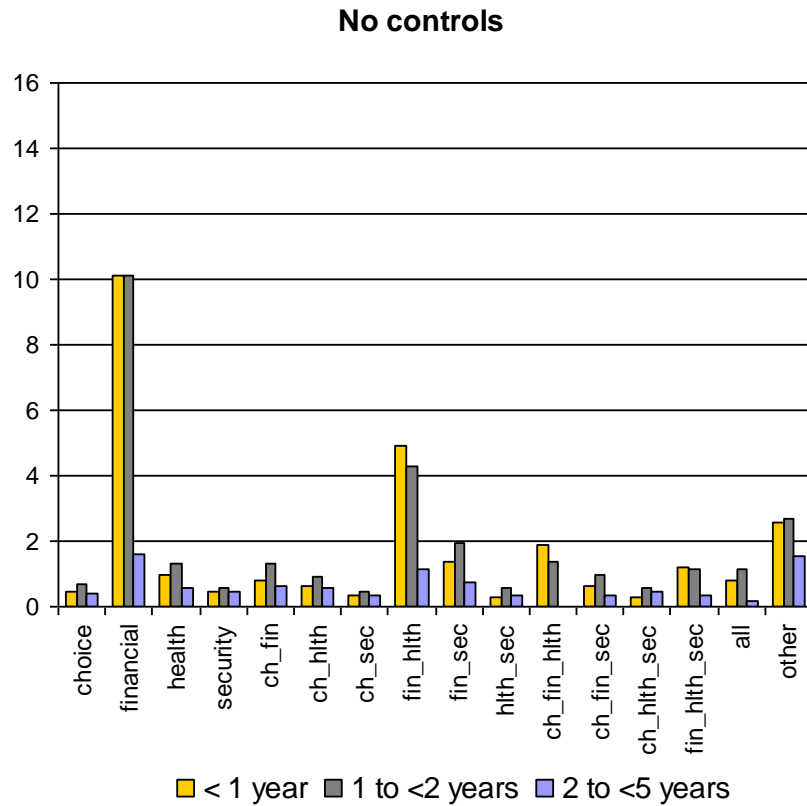
**Figure 4: Distribution of duration of health insurance cover across insurance types**



**Table 9: Multinomial Logit Estimates for Time in Cover (Insured only)**

Variable	Less than 1 year		1 to less than 2 years		2 to less than 5 years	
	RRR	P> z	RRR	P> z	RRR	P> z
Choice	<b>0.697</b>	0.055	1.037	0.839	<b>0.646</b>	0.024
Financial	<b>13.792</b>	0.000	<b>12.618</b>	0.000	<b>2.012</b>	0.000
Health	<b>1.895</b>	0.011	<b>2.568</b>	0.000	1.121	0.704
Security	<b>0.599</b>	0.002	<b>0.741</b>	0.070	<b>0.511</b>	0.000
ch_fin	1.001	0.998	<b>1.483</b>	0.039	0.729	0.153
ch_hlth	1.255	0.527	<b>2.027</b>	0.026	1.301	0.465
ch_sec	<b>0.468</b>	0.000	<b>0.598</b>	0.009	<b>0.472</b>	0.000
fin_hlth	<b>8.275</b>	0.000	<b>7.084</b>	0.000	1.894	0.112
fin_sec	<b>1.721</b>	0.005	<b>2.229</b>	0.000	0.754	0.205
hlth_sec	0.626	0.177	1.307	0.336	0.736	0.350
ch_fin_hlth	<b>2.878</b>	0.003	2.030	0.073	0.000	1.000
ch_fin_sec	0.795	0.293	1.107	0.612	<b>0.392</b>	0.000
ch_hlth_sec	0.515	0.219	1.211	0.625	0.935	0.876
fin_hlth_sec	1.864	0.109	1.740	0.169	0.556	0.347
all types	1.605	0.255	<b>2.387</b>	0.020	0.401	0.220
only other	<b>2.484</b>	0.000	<b>2.488</b>	0.000	1.186	0.488
age30s	0.986	0.913	1.107	0.383	<b>0.644</b>	0.001
age40s	<b>0.535</b>	0.000	<b>0.586</b>	0.000	<b>0.270</b>	0.000
age50s	<b>0.394</b>	0.000	<b>0.382</b>	0.000	<b>0.168</b>	0.000
age60s	<b>0.180</b>	0.000	<b>0.161</b>	0.000	<b>0.130</b>	0.000
age70over	<b>0.047</b>	0.000	<b>0.050</b>	0.000	<b>0.115</b>	0.000
Female	<b>1.186</b>	0.038	1.161	0.053	0.921	0.404
bornOther	<b>1.620</b>	0.000	<b>1.599</b>	0.000	<b>2.073</b>	0.000
Diploma	0.875	0.115	0.992	0.916	1.048	0.660
Degree	<b>0.719</b>	0.001	<b>0.772</b>	0.007	0.913	0.465
Couple	1.013	0.905	1.107	0.302	0.816	0.113
sole parent	1.278	0.212	1.193	0.355	1.478	0.121
couple with deps	0.820	0.066	<b>0.819</b>	0.049	<b>0.686</b>	0.005
full time emp	1.076	0.776	1.581	0.097	1.232	0.514
part time emp	1.019	0.942	1.434	0.200	0.741	0.374
not in LF	0.880	0.631	1.295	0.363	1.004	0.989
\$400 to 599	0.801	0.194	0.838	0.288	0.773	0.224
\$600 to 799	<b>0.709</b>	0.043	0.729	0.053	0.675	0.068
\$800 to 999	0.750	0.089	<b>0.684</b>	0.021	0.799	0.290
\$1000 to 1499	<b>0.570</b>	0.000	<b>0.709</b>	0.023	0.846	0.391
\$1500 to 1999	<b>0.501</b>	0.000	<b>0.604</b>	0.003	1.023	0.914
\$2000 to 2499	<b>0.436</b>	0.000	<b>0.476</b>	0.000	<b>0.530</b>	0.032
\$2500+	<b>0.286</b>	0.000	<b>0.306</b>	0.000	0.709	0.188
income not stated	<b>0.660</b>	0.005	<b>0.697</b>	0.012	0.747	0.099
Very Good	1.217	0.058	1.105	0.287	0.851	0.172
Good	1.218	0.074	1.085	0.420	0.812	0.108
Fair	<b>1.586</b>	0.001	1.291	0.062	0.857	0.402
Poor	1.029	0.915	1.170	0.521	1.283	0.358
Number LTC	<b>0.905</b>	0.000	<b>0.872</b>	0.000	<b>0.926</b>	0.015

**Figure 5: Relative Risk Ratios of Time in Cover by Type (relative to insured more than 5 years)**



## References

- Ahn, N., De La Rica, S., Ugidos, A., 1999. Willingness to move for work and unemployment duration in Spain. *Economica*. 66, 335-357.
- Barrett, G.F. and Conlon, R. (2003), Adverse selection and the contraction in the market for private health insurance: 1989-1995, *Economic Record*.
- Besley T, Hall J and Preston I. (1999) The demand for private health insurance: do waiting lists matter? *Journal of Public Economics* 72: 155-181.
- Burchardt T and Propper C (1999) Does the UK have a private welfare class? *Journal of Social Policy* 28: 643-655.
- Butler, J.R.G (2002), Policy Change and Private Health Insurance: Did the Cheapest Policy Do the Trick?, *Australian Health Review*, 25(6), 33-41.
- Cameron, A. C. and P. K. Trivedi (1991). The role of income and health risk in the choice of health insurance : evidence from Australia. *Journal of Public Economics* 45: 1-28.
- Darnhofer, I., Schneeberger, W., Freyer, B., 2005. Converting or not converting to organic farming in Austria: Farmer types and their rationale. *Agriculture and Human Values*. 22, 39-52.
- Doiron D, Jones G and Savage E (2005) Healthy, wealthy and insured? The role of self-assessed health in the demand for private health insurance. Mimeo.
- Hall, J. De Abreu Lourenco R, and Viney R (1999) Carrots and Sticks – the rise and fall of private health insurance in Australia, *Health Economics*, 8, 653-660.
- Hall J & Savage E (2005) Increased subsidisation for the private sector in Australia in Maynard A (ed) *The public private mix for health*. Nuffield Trust.
- Harmon, C. and Nolan, B. (2001). Health insurance and health services utilization in Ireland. *Health Economics* 10:135-145.
- Harris, K. M. and M. P. Keane (1999). "A model of health plan choice: Inferring preferences and perceptions from a combination of revealed preference and attitudinal data." *Journal of Econometrics* 89: 131-157.
- Hersch, J., Pickton, T. S., 1995. Risk-taking activities and heterogeneity of job-risk tradeoffs. *Journal of Risk and Uncertainty*. 11, 205-17.
- Propper C (1989) An econometric analysis of the demand for private health insurance in England and Wales *Applied Economics*, 21: 777-792.
- Propper C (1993) Constrained choice sets in the UK: demand for private medical insurance *Journal of Public Economics*, 19: 287-307.
- Propper C (1999) The demand for private health care in the UK. *Journal of Health Economics* 19: 855-876.
- Propper C, Rees H and Green K (2001) The demand for private medical insurance in the UK: a cohort analysis. *The Economic Journal* 111: c180-c200.
- Shmueli A (2001) The effect of health on acute care supplemental insurance ownership: an empirical analysis. *Journal of Health Economics* 22: 331-359.



Appendix A: Tree diagrams of reasons  
 Appendix A: Frequencies of combinations of Reasons

