DEMOGRAPHIC VARIABLES AND THE APPRAISAL OF INSURANCE: THE CASE OF 'ASSISTANCE PRODUCTS'

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Abstract

In recent years, insurance companies have tried to diversify their traditional products by introducing additional features that are commonly referred to as "assistance products". The present paper is based on a related consumer survey, further analysing the explanatory power of demographic variables. Although they enjoy widespread use, the strength of relationship to the judgement of tested products is weak and unsystematic: generally, the factors are significant for some services, but not throughout the range of products. In addition, the direction of the relationship is often mixed, with both, positive and negative associations. Effect sizes are generally weak, with even the highest scores being comparatively low. The results show that demographic characteristics alone do not give satisfactory clues for the judgement of assistance products. Often, they are valued most favourably by distinct subgroups of the sample, which indicates that judgements are situational rather than systematic. This fits into the picture of several previous studies of more traditional insurance products. Therefore, the practical and theoretical value of demographic variables seems questionable.

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Introduction

In recent years, insurance markets in the European Union have changed dramatically. Liberalisation and the establishment of the European Single Insurance Market have stimulated competition, which – among other effects – led to a much larger variety of insurance products. In diversifying their product range, insurance companies often create additional services for their existing offers. Such services are generally referred to as "assistance products" or sometimes only termed "assistance". They can be purchased as an option to an insurance contract, but also independently. These services are regarded as the dominant field for innovation in the European Union's insurance industries.

Although these assistance products are not insurance contracts in a traditional sense, they still carry their peculiarities (Dorfman 1998): The service is conditional on the occurrence of a loss that is accidental and beyond the purchaser's control; furthermore, it is definite and measurable. From that perspective, assistance products are very similar to insurance contracts, with the major difference that they often promise the provision of a predefined service instead of an indemnification in money.

One of the world's leading insurance companies has given the author the opportunity to further analyse a data set containing consumers' attitudes toward a large number of such assistance products. The data have been collected via multi-topic ("omnibus") interviews, using a representative sample of the population. This is a big advantage over studies among students. In addition, there is no such comprehensive survey concerning assistance products so far, presumably due to the relative novelty of such products.

There are essentially two approaches to explain insurance consumption by demographic variables: The first one usually takes demographic and insurance data of some geographic entity, for instance a particular country, and investigates the relationships between them. Browne, Chung, and Frees (2000) provide a recent example for this line of research. The second approach focuses on individuals, in particular, the survey method is employed to assess the demographic characteristics of the subjects in the sample on the one hand, and the insurance contracts that they have or the preferences they show towards some given coverage on the other. The present paper obviously follows the second line, which puts us into the position to compare this survey of assistance products to other work related to more traditional forms of insurance.

The paper is organised as follows: In the following section, we will describe the parameters of the survey. Then, its results are presented and interpreted. In the final part of the paper, we shall discuss the findings in relation to preceding work on insurance demand.

Data collection

It has been noted that this survey benefits from being based on a large, representative sample (N=450). This advantage, however, is accompanied by the drawback that only aggregate data are available and no results for single subjects. This implies that we are restricted to single-factor analysis and cannot examine a particular subject's answers for two or more products simultaneously. The same applies for personal traits. Another – although minor – limitation of this study is that the name of the insurance company that provided that data cannot be disclosed.

The data were collected by computer-assisted telephone interviews, thus ensuring a random sampling within the predefined groups, reflecting the distribution of the various characteristics within the population. Another criterion was that the subjects had to be responsible for insurance decisions in their particular households and at least 18 years old.

The subjects were asked to give their personal ratings (very important, important, not important) for a total number of 43 assistance products in four different categories: Accident and health, automobile, travel, and general security. As is common for such studies, the participants received quite limited information concerning the different items. In addition to their rating, subjects indicated their gender, age, income, the number of inhabitants in their home town or village, the number of people living in the same household, and whether or not they go to work.

Results

The approval rate, indicating that subjects value a certain assistance product as important or higher, is presented in the appendix. In the same table the x^2-test results for the demographic variables are summarised along with measures of association, Cramér's V for nominally scaled variables, Kendall's τ_c if the scale is ordinal.

As can be readily seen, the variable representing the number of inhabitants is not listed, as it is not significant for any of the tested products. Also, there are some products that were unanimously rated across all groups of subjects. They include – in order of approval rate – ambulance service, repatriation of deceased, search and forward luggage, laundry service and flight delay. For other services, such as for instance the coverage of towing charges, judgements vary considerably.

Turning to the demographic variables themselves (gender, age, etc), we find that gender is related predominantly to two groups of products, namely to the accident and health category and to general security. As a general rule, the ratings assigned by women are higher. In many, but not in all cases, this implies that men tend to reject the products in question. At some occasions, however, the ratings between females

and males differ only in their degree of approval, with the women being in favour of the coverage to a higher extent than men are. Cramér's V is quite low, indicating that the association between gender and the product rating is weak. The maximum value is around .2, even which, following Cohen (1998), is regarded as a small effect size. Although large effect sizes such as values around .8 are found only very rarely in the social sciences, there is little reason to assume that gender makes a big difference in judgement of these assistance products.

At first glance, the respondent's age seems to have more influence on approval. This is particularly true for assistance products in the category automobile, while – unlike gender – there are significant relationships to elements of all other groups as well. Because the age groups in the sample can be interpreted as a variable of ordinal scale, Kendall's tau c is used as a measure of association, which has the advantage of indicating the direction by its sign. In most cases, this sign is negative, which points at a decreasing rate of approval by elder respondents. Tau c is not stated in such cases when it is insignificant. These cases and the effect sizes that are quite low again both indicate that there is no continuous association between age and degree of approval. Indeed, attitudes towards the tested products can be best described in a way that respondents in the eldest category (above 60 years of age) believe the products to be unnecessary. This holds, although to a lesser extent, also for the middle-aged group of subjects between 30 and 44 years of age. Therefore, high ratings generally come from the other two groups (18-29 and 45-60, respectively). Not surprisingly, the strength of association is strongest for some products (looking after children, assistance to dependants, transport home for children) that are related to certain phases in life.

Compared to age, net income (that is after taxes and social security contributions) seems to be an important factor in only relatively few cases. On top of that, the direction of the association is mixed: The sign of tau c is negative for products in the accident and health category, thus indicating that approval decreases with increasing income, while it is positive in others. Associations are even weaker than before. Sometimes they are insignificant and again, tau c is not given in these cases. Like for age, this indicates that certain subgroups are different. Closer inspection reveals that variations in the extent of approval are responsible, which means that products are rated controversially. The coverage of medical aid provides a good example: both, disapproval ("not important") and highest rating ("very important") are most common in the lowest income group, while the medium category ("important") has been chosen by higher income groups. The ratings for products in the accident and health category may hint at an increased ability of people with higher incomes to cover the respective costs without insurance, for instance from liquid means, savings or other sources. A different interpretation may focus on the fact that high-income subjects judge products related to car driving and travel more favourably. Although this conclusion is beyond

the scope of the present study, one might speculate that people with higher earnings drive their cars and travel more often.

In most cases, the offered assistance products receive more favourable judgements when the number of people living in the same household increases. This is indicated by positive values of tau c. Again, missing numbers mean that values are insignificant. Effect sizes are in about the same order of magnitude as for age; that is, they are rather small, but still larger than for the variable household income. Lunch service is the sole exception to the above-mentioned rule, as very small, one- or two-person households gave the highest ratings for this coverage. This is in fact not implausible, as in larger households, it is easier to organise the supply of meals. A number of those products that are rated significantly higher by people living in larger households is connected with the presence of children, with car driving and travel. This gives a good reason to believe that the small households in the sample do not belong to the young single stereotype, but rather comprise older people with little affinity to travelling and to driving cars.

Unemployed subjects generally believe the tested assistance products to be not important. This attitude is most pronounced for products related to the presence of children and to driving a car or travelling. Again, this suggests that in this sample unemployed practically means that the particular subject is an old age pensioner rather than a housewife with young children. This might also explain why for the coverage of visits to a hospital, people who do not go to work give higher ratings than others. The measure of association, which is again Cramér's V in the case of this variable, reaches somewhat higher values than for the variable gender, however, effect sizes are small like for all variables included in this survey.

In order to draw an overall view of the importance of the demographic, we may use the Fisher combined test (Wolf 1996). Note that in the case of this particular combined test, significance does not imply a specific direction, but only significant structural differences. The results are summarised in the following table (df = degrees of freedom, s = significant, ns = not significant):

Variable	Category	x^2	df	s/ns
Gender	Accident / health	95.0076	32	s
	Automobile	29.5155	18	ns
	Travel	35.2157	16	s
	General security	58.7912	20	s
Age	Accident / health	113.2068	32	s
	Automobile	119.5438	18	s
	Travel	65.4656	16	s
	General security	71.4016	20	s
Number of Inhabitants in home town	Accident / health	27.6513	32	ns
	Automobile	10.7481	18	ns
	Travel	10.6215	16	ns
	General security	17.2558	20	ns
Number of persons living in the same household	Accident / health	88.7336	32	s
	Automobile	88.6480	18	s
	Travel	62.3064	16	s
	General security	74.1172	20	s
Household income (net)	Accident / health	76.6397	32	s
	Automobile	48.9155	18	s
	Travel	32.4348	16	ns
	General security	28.0802	20	ns
Working	Accident / health	87.8362	32	s
	Automobile	84.9437	18	s
	Travel	51.6891	16	ns
	General security	46.7798	20	ns

Table 1: Results of Fisher combined test for demographic variables and categories of assistance products

As a result of the Bonferroni correction that is employed to reduce the probability of type I errors, critical values and corrected significance levels α^* vary:

Category	χ^2	1-α*
Accident / health	58.1835	.9968
Automobile	36.8050	.9944
Travel	33.5468	.9950
General security	39.9968	.9937

Table 2: Critical values per category

Because of the above-mentioned property of the Fisher combined test, the results are best interpreted in that way: where results are nonsignificant, there is no reason to assume that aggregate judgements depend on the respective variable. Significant results, however, indicate that ratings seem to vary depending on that particular variable, but not necessarily in an unambiguous way.

Discussion

Overall, neither variable is strongly related to the judgement of the assistance products included in this survey. This holds not only for the directionality of the effect, as we observed both, positive and negative relationships, it is also true in the sense that variables may an important factor for some products, but not throughout the whole range of coverages.

A rather obvious explanation is that there is no ubiquitous relationship between one of the factors and judgements concerning assistance products, but rather a situation-dependent one. As Lott (1996) put it in a discussion concerning gender differences in risk taking, there certainly are differences explained by demographic characteristics for some behaviours, in some situations, at some times and places, but not as a general rule.

There is some evidence in the relevant literature that lends support to this interpretation: For instance, concerning gender, Burnett and Palmer (1984) do not find that the holding of life insurance contracts is different depending on the policyholder's gender. Barringer and Milkovich (1996) obtain a similar result for health insurance contracts. Schubert et al. (1999) find that gender differences tend to occur only under abstract survey conditions, while they disappear when questions are asked in-context, like in the present case. In a recent meta-analysis, Byrnes, Miller, and Schafer (1999) also draw a similar conclusion.

These discrepancies also occur in other risky situations: Riley and Chow (1992), for instance, find that for investments, females appear to be slightly more risk-averse, gender, however, seems to play only a minor role. The results by Wärneryd (1996) lend support to this view. Jianakoplos and Bernasek (1998) reach a more detailed

conclusion, finding that single women are significantly more risk averse than single men or married couples. These examples clearly show that things are somewhat more complex to be explained by gender as a single factor.

Quite the same can be said for age: Recently, Hau (2000) presented an overview to several empirical studies in life insurance demand, listing positive, negative, and insignificant results as well as outcomes that age interacts with another variable, namely income. Burnett and Palmer (1984) do not find a significant influence of age on life insurance holdings, whereas for credit insurance, essentially a special case of life insurance, Barron and Staten (1996) report that elder people carry more of this type of insurance. The case of life insurance also shows that it is perhaps misleading to group all its various forms together into one category, as they in fact serve quite different purposes. This factor is likely to play a similar role in investment decisions as well (Riley and Chow 1992).

As for income, there are essentially two arguments concerning the relationship between income and the holding of insurance contracts: in the first opinion, rising income is accompanied by increasing property assets that need to be insured. Additionally, if someone's income is higher than what he or she needs for immediate consumption, there is an increased possibility for investment, for instance in life insurance. On the other hand, there is the different viewpoint that people, who reach higher incomes, have the opportunity to assume risks themselves, mainly those with small sizes of loss, thus reducing insurance demand. In fact, most assistance products included in this study would fall into this category. Therefore, it is not surprising, when we find mixed results concerning income and insurance preferences. The often-contradicting results by Anderson and Nevin (1975), Duker (1969), Burnett and Palmer (1984), as well as by Barron and Staten (1996) support this view.

Concerning the number of inhabitants which has not been significant for any of the tested products, the present results are not consistent with those by White-Means (1989), who finds different preferences towards health insurance by region. For other risky decisions, however, Riley and Chow (1992), Pålsson (1996) and Wärneryd (1996), do not find any regional particularities.

Overall, the result of the present study supports the notion that demographic variables do not offer a good explanation for consumers' preferences for insurance and similar products. Instead, we suggest that judgements are situation-specific rather than depending on demographic characteristics of the decision-maker. The results by Byrnes, Miller, and Schafer (1999) support this interpretation, as they find effect sizes of about the same (i.e. small) size like the present study for no less than 150 studies concerning gender differences. Picking up the conclusion by Schubert et al. (1999), that gender differences disappear once the judgement task becomes more concrete, we would expect that for very specific questions, subjects' answers

increasingly depend on their particular situation beyond the particular survey. For instance, if automobile accident insurance is to be judged, it makes a difference whether or not a subject drives a car, while for general accident insurance, it does not or at least to a lesser extent. Therefore, for such specific items as in the present case, other explanatory patterns, such as mental availability or representativeness might perform better.

Aggregate analysis shows that even though there are single significant results in each category, on the whole, travel and general security do not seem to be related to variables describing household income and whether the subjects go to work. The same applies for gender and products in the category automobile as well as for the number of inhabitants of a subject's hometown. Age and the number of persons living in the same household seem to have a more general, though weak influence.

Summary

The present paper provides a detailed description of consumers' judgements towards a comparatively new class of insurance products. We find that the variables used in this survey perform quite differently and if there is a significant relationship, it seems to be comparatively weak. The present results fit well into previous work related to various forms of insurance that has also led to rather mixed findings. From that perspective, traditional insurance contracts and the recently introduced assistance products do not seem to differ a lot. With demographic variables performing only weakly to explain product judgement, it seems advisable for future research to focus on alternative factors.

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Appendices

1.1 Assistance Products included in the survey

Following an accident, serious sickness, or various losses, the insurer will pay:

1) Accident and health: a) rescue operations, emergency transport, b) transport to a hospital in country of residence, c) repatriation of deceased, d) assistance in housework, e) home nursing, f) someone to look after children, g) someone to look after pets, h) someone to look after flat, i) lunch service, j) assistance to dependants in case of death, k) medical aid, l) ambulance service, m) shipment of medicine, n) visit to the hospital, o) transport home for children or pets, p) advance on costs for medical care abroad
2) Automobile: a) breakdown service, b) towing charges, c) recovery, d) hotel room, e) car rental, f) transport by train or aeroplane, g) home transport of car, h) getting hold of spare parts, i) scrapping
3) Travel: a) emergency call, b) emergency transport, c) substitute driver, d) interpreter, e) document service abroad, f) search and forward luggage, g) flight delay, h) advance payment
4) General security: a) stop cheques and credit cards, b) locksmith, c) furniture storeroom, d) drainage, e) guarding, f) spare heating, g) overtime premium, h) laundry, i) arrange solicitor, j) bail

1.2 Summary statistics

Given: Rate of approval (in percent), x^2-values, Kendall's τ_c, Cramér's V. Missing values indicate nonsignificant results.

1.2.1 Accident and Health

Description	App. %	Gender χ^2 V	Age χ^2 τ_c	Income χ^2 τ_c	Household χ^2 τ_c	Work χ^2 V
Rescue operations	88		29.645*** -.160		11,022* .111	9.772** .150
Transport home	81	7.485* .130				
Repatriation of deceased	70					
Housework	79			12.519* -0.95		9.772** .150
Home Nursing	82	16.698*** .193	16.448*			
Children	67		35.219*** -.245		19.788*** .164	12.893** .173
Pets	34	9.116** .144		10.371* -.107	10.603*	
Flat	59	19.194*** .208		13.158* -.132		

Description	App. %	Gender χ^2 V	Age χ^2 τ_c	Income χ^2 τ_c	Household χ^2 τ_c	Work χ^2 V
Lunch service	68	8.356* .015		13.347* -.140	11.341* -.082	8.101* .136
Dependants	71		32.086*** -.194		20.852*** .151	
Medical aid	85	8.790* .012		10.334*		
Ambulance service	83					
Medicine shipment	55		13.237*			
Hospital visit	54		16.742**			6.725* .124
Transport of children, pets	64		28.530*** -.189		36.620*** .199	10.762** .158
Advance on costs	71		15.148* -.107		9.992*	

1.2.2 Automobile

Description	App. %	Gender χ^2 V	Age χ^2 τ_c	Income χ^2 τ_c	Household χ^2 τ_c	Work χ^2 V
Breakdown service	69		43.329*** -.156	12.994*	17.592*** .122	12.030** .166
Towing charges	64	8.153* .017	27.279*** -.090	13.002* .083	15.465** .112	12.735** .171
Recovery	64		49.073*** -.149	13.881** .073	16.706** .121	15.972*** .191
Hotel room	63		45.315*** -.173		51.346*** .220	8.104* .136
Car rental	57		36.020*** -.186		13.575** .106	10.211** .153
Train, aeroplane	69		40.817*** -.146		13.480** .086	6.439* .122
Transport of car	59		33.342*** -.150		22.303*** .153	16.811*** .196
Spare parts	50		29.763*** -.101			
Scrapping	34		16.577*			

1.2.3 Travel

Description	App. %	Gender χ^2 V	Age χ^2 τ_c	Income χ^2 τ_c	Household χ^2 τ_c	Work χ^2 V
Emergency call	61		13.749* -.088		13.412** .078	9.977** .151

Description	App. %	Gender χ^2 V	Age χ^2 τ_c	Income χ^2 τ_c	Household χ^2 τ_c	Work χ^2 V
Emergency transport	70		31.282*** -.170	13.566**	14.356**	20.656*** .217
Substitute driver	49	8.834* .143	15.500*			
Interpreter	70		14.524* -.118	11.669*	9.864* .083	9.602** .148
Document service	76		20.588** -.089		20.956***	
Luggage search	59					
Flight delay	41					
Advance payment	77		31.913*** -.137	9.772* .089	19.441*** .089	9.793** .150

1.2.4 General security

Description	App. %	Gender χ^2 V	Age χ^2 τ_c	Income χ^2 τ_c	Household χ^2 τ_c	Work χ^2 V
Cheques, credit cards	74		33.916*** -.185		21.859*** .109	9.995** .151
Locksmith	60	14.193*** .180		12.227*	14.656** .090	
Storeroom	52	6.812* .126			13.003* .080	
Drainage	75	7.551* .131			12.456* .091	
Guarding	62	8.209* .137	16.451*		14.598** .109	7.504* .131
Spare heating	48	6.822* .126				
Overtime premium	43	9.039* .147	14.296* -.119			11.193** .165
Laundry	44					
Solicitor	75		27.019*** -.178		11.265*	7.541* .132
Bail	55		29.880*** -.203		12.441* .081	