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Maria Forlicz*

Wrocław University of Economics

Tomasz Rólczyński**

Wrocław School of Banking

LEVEL OF KNOWLEDGE AND ANSWERS GIVEN IN A SURVEY RESEARCH. EXAMPLE OF INSURANCE PREFERENCES SURVEY

Abstract

Survey (meant as a questionnaire), next to experiment, is one of the most commonly applied in behavioral finance methods of acquiring information about people's behavior. However, there is some disagreement between scientists what is the real informative value of results obtained from surveys. Some claim they are worthless (e.g. Neill, Cummings, Ganderton, Harrison, McGukin, 1994), others maintain that there are no significant differences between attitudes declared in questionnaires and real field behavior (e.g. Dohmen Falk, Huffman, Sunde, Schupp, Wagner, 2011). In this paper we present results of research on the relationship between students' level of knowledge (measured by average of grades obtained during studies) and their answers given in a survey which concerned attitude towards risk. A hypothesis that *subjects answering questions about insurance preferences having higher level of knowledge give answers closer to results that could be obtained from a mathematical calculation* was verified.

Keywords: behavioral finance, survey, experiment, desired value, probability, loss, risk, insurance premium

* Address e-mail: mforlicz@ue.wroc.pl.

** Address e-mail: tomasz.rolczynski@wsb.wroclaw.pl.

Introduction

Behavioural finance is a controversial research topic, as it questions the conventional finance science and its achievements over the past century. In their research financial behaviourists apply such methods as experiments, psychological tests and surveys. All of them being an attempt to observe reality. However, according to well known in physics Heisenberg's uncertainty principle (Heisenberg, 1927), it is not possible to observe a particle without influencing its state. In psychology a similar phenomenon is known as the Hawthorne Effect. In 1920's a group of researchers conducted an experiment in Hawthorne plant trying to verify what amount of light makes employees more productive. Scientists have noticed that independently of the amount of light productivity of workers has increased during research period which was assigned to the sole fact of participation in the study (French, 1953). If Hawthorne Effect really exists [as some (Jones, 1992) claim results obtained in Hawthorne plant do not necessary confirm that] behavioral scientists should pay a lot of effort to remember of its existence while analyzing experimental or survey results. It is a hard but essential task for a behavioral scientist to choose a method of research that is less invasive and gives him/her the best look on the reality.

In this article an attention is focused on a survey as a method of preferences' elicitation. The objective of the article is to make an assessment of the relationship between the responses given by the respondents in a survey and their knowledge level measured by their final marks average. We suppose that it is possible that some of respondents instead of revealing their real preferences give answers that (according to them) are correct. We relate it to the widely described in literature *social desirability effect* (see Section 1) as we suppose that people answering questions in a survey more than answering honestly are willing not to appear unwise.

The hypothesis that is to be verified is that: *subjects answering questions about insurance preferences having higher level of knowledge give answers closer to results that could be obtained from a mathematical calculation.*

The hypothesis stated above is to be verified on the basis of data obtained from a survey research conducted in 2013 among students frequenting Wrocław School of Banking.

The organization of the paper is as follows. In the first Section 1 we shortly describe some issues concerning surveys. Section 2 assesses relationship between level of knowledge and responses given in survey and the last section summarizes obtained results and conclusions drawn.

1. Validity of surveys as a research method

Conducting a survey every scientist hopes to get results that are closest to the truth, but unfortunately for years researchers report issues in surveys' validity.

The first problem in conducting both surveys and experiments is the impossibility to control all factors influencing subjects. An influence on subjects' answers can have, for instance, the interviewer's person itself. It was found, *inter alia*, that interviewer's gender (Flores-Macias, Lawson, 2008) or even voice intonation (Groves, 2004) can affect subjects' responses. Also, an answer to one question can be affected by other items included in the questionnaire (Tourangeau, Rasinski, 1988). The manner the question is worded can cause mood changes temporarily modifying attitude (Podsakoff, MacKenzie, Lee, Podsakoff, 2003). Great impact on results obtained can have also questions framing (Tversky, Kahneman, 1986) i.e. the way questions are formulated. Questioning mode (choice or matching) as well was shown to influence elicited preferences (Mousseau, 1997).

Another important problem is often reported hypothetical bias. Scientists cannot agree on the informative value of hypothetical surveys, some deny it completely (Neill, Cummings, Ganderton, Harrison, McGukin, 1994), some find survey results a good predictor of field behavior (Dohmen, 2005). For example there is strong evidence that declared in surveys willingness to pay for some good is usually higher than actual one (List, Shogren, 1998), but the difference can be reduced by entreaty to answer honestly and "as if it were real" (Loomis, Brown, Lucero, Peterson, 1996) and as Botelho and Costa Pinto (2002) claim even if hypothetical willingness to pay overestimates real one the distribution of predicted (on the basis of hypothetical answers) real WTP matches well the distribution of real WTP.

The last of the most common issues is related to respondents. Some subjects participating in surveys with topics that may be socially sensitive modify their answers so that they are easily accepted by sociality (Shogren, Fox, Hayes, Roosen, 1999), for some subjects complex problems are too complicated so they intendedly or not omit one or more attributes during taking decisions (Hensher, Rose, Greene, 2005), some indulge temptation to (instead of looking for an optimal answer) give minimally acceptable answers (Krosnick, 2000). Moreover, what is even more problematic to scientists, some authors claim that it is impossible to elicit attitudes on some issues in a survey simply because most people "do not possess preformed attitudes at the level of specificity demanded in surveys" (Zaller, Feldman, 1992).

2. Methodology and research results

Mathematically correct way to assess a certain equivalent of a gamble is to calculate its expected value, but as many scientists indicate that the valuation of a gamble by a person is often affected by other factors (Kahneman, Tversky, 1979). As shown by the authors (Rólczyński, Forlicz, Kuźmiński, 2015), people in specific conditions are willing to give up part of the possessed goods to be able to keep the rest for sure, even if the rest is less than the expected value of the game. The results of decisions can also depend on, inter alia, gender, ability to earn and whether the game concerns the potential gains or losses. The original research (Forlicz, Kowalczyk-Rólczyńska, Rólczyński, 2014) conducted by Authors was an attempt to assess the influence of information with regard to the value of an expected damage, probability of damage occurrence itself and differentiation of the size of the damage on the acceptable price of insurance premium (on the example of a voluntary comprehensive motor insurance).

The research was conducted in a survey form among approx. 600 students of extramural programmes of study (1st and 2nd degree and post-graduate studies) of Wrocław School of Banking. Due to no replies or illogical replies received, at the outset about 10% of observations were eliminated (depending on a question). The research was conducted in two rounds always in the same student groups, at an interval of two or three weeks, however, the list of persons from the first and the second round of the research was not always the same. The questions were divided into the ones asked in the first and the second round in a way that the subjects could not know instantaneously which factors are manipulated by the researchers.

In the first round the following questions were asked:

1. *A person, called the Unknown, has a car worth 30,000 PLN and he/she considers if he/she should spend money on comprehensive motor insurance. This person knows that among other similar people every year 100 per 1,000 people suffer different damages (accident, theft, bump or the like). The average amount of this damage equals 6,000 PLN. What is your opinion? At what price of insurance (for one year period) should this person decide to insure his/her car?*
2. *Another person, let's call her/him the Dark Horse, has also a car worth 30,000 PLN and he/she considers if he/she should spend money on comprehensive motor insurance. This person knows that among other similar people every year 200 per 1,000 people suffer different damages (accident,*

theft, bump or the like). The average value of such damage amounts to 3,000 PLN. What is your opinion? At what price of insurance (for one year period) should this person decide to insure his/her car?

- 3. A person, called the Secret, likewise other presented here, has a car worth 30,000 PLN and he/she considers if he/she should spend money on comprehensive motor insurance. This person knows that among other similar people every year 100 per 1,000 people suffer different damages (accident, theft, bump or the like). Usually these persons do not suffer any major damages whose value is the most often from 5,500 PLN to 6,5 PLN, so the average value of a damage equals 6,000 PLN. What is your opinion? At what price of insurance (for one year period) should this person decide to insure his/her car?*

The third question includes the same information about the situation of the person who is going to take insurance as in the first question, however, additionally, variability of the size of damage possible to be incurred was given.

The second round includes the following questions:

- 1. Some person, let us call him/her the Mysterious, has a car worth 30,000 PLN. As every year, he/she considers if he/she should spend money on comprehensive motor insurance. This person knows that among other similar people every year 100 per 1,000 people suffer different damages (accident, theft, bump or the like). The average value of such damage amounts to 3,000 PLN. What is your opinion? At what price of insurance (for one year period) should this person decide to insure his/her car?*
- 2. A person, called the Enigmatic, like others, has a car worth 30,000 PLN and he/she considers if he/she should spend money on comprehensive motor insurance. This person knows that among other similar people every year 100 per 1,000 people suffer different damages (accident, theft, bump or the like). Usually for 60 out of these 100 people a damage is only a minor bump that ends up with a repair worth 1,000 PLN, 20 people have their cars broken into and damaged at the value of a few (approx. 7) thousand Polish zloty, and 20 people has a serious accident and the repair's costs are usually very high (20,000 PLN). What is your opinion? At what price of insurance (for one year period) should this person decide to insure his/her car?*
- 3. Another person, let's call her/him the Dark Horse, has also a car worth 30,000 PLN and he/she considers if he/she should spend money on comprehensive motor insurance. He/she knows that among similar people,*

every year the average value of a loss incurred in different circumstances (accident, theft, etc.) equals 6,000 PLN. Insurance of such a car costs... At what probability of damage occurrence, according to you, concluding a car insurance agreement is viable for the Dark Horse person?

In the second round the average size of damage was changed in the first question in comparison to the first question from the first round, and the probability of damage occurrence was changed in comparison to the second question from the first round. In the second question of the second round, the changeability of damage possible to be incurred was given once again, yet, this time it was greater than in the third question of the first round. There was a completely different question asked in the third question of the second round, namely about probability. In this question about half of people were offered insurance at the price that the people gave in the first question of the first round, and they checked if these people gave the same value of probability of damage occurrence (which would induce them to take insurance) as the probability shown in the first question of the first round. In case of other people, the average price given in a student group was submitted as the insurance price.

After conducting the basic research and obtaining partially puzzling results, authors started to wonder whether it is possible that part of the people treated completing the survey as an additional task given during classes and whether they answered more with their “brains” than with their “hearts”, so by applying the methods they knew from their classes, what is certainly an undesirable effect. It was assumed that if it had been so, then the persons with better marks on average would have given responses more similar to the ones resulting from statistics than the persons with worse marks. In order to check this possibility, the responses of the surveyed were compared with the average final marks from previous years of studies, whereas this comparison was made only in the group of these people who in the third question of the second round were offered an insurance at the price they gave in the first question of the first round.

In the first step, parameters of regression lines, which describe a dependence of a standardized response with a given question that was changed into a neutral (wherein a nominal value was assumed as the expected loss value in questions from 1 to 3 of the first round and the questions 1 and 2 of the second round, while a value of probability which guarantees that the premium amount equalizes with the expected loss value in the third question of the second round) on a standardized final marks average of a student were described. Table 1 presents the results of these calculations together with relevance of a directional parameter.

Table 1. Slope of regression lines that describe dependence of a standardized response to a given question changed into a neutral on a standardized final marks average of a student

Question Number	Slope	<i>P</i> value
1 (I)	0.028871742	0.044193
2 (I)	0.020133623	0.123813
3 (I)	0.013257729	0.259258
1 (II)	0.023440768	0.094496
2 (II)	0.008690122	0.485128
3 (II)	0.056788647	0.001024

Source: authors' work based on authors' own research.

In most cases there is no essential relationship between the responses' deviation from an expected value and the final marks average of a student (directional parameters do not differ substantially from zero). Only in case of the first question of the first round and the third question of the second round directional parameters may be deemed essential. The most visible relevance of the final marks average of a student may be observed in the third question of the second round, i.e., the question about probability. As it was noted above, due to the responses given by respondents this question was deemed the most difficult in the survey. It is likely that the persons who have better marks decided to give a response consistent with what they were taught, instead of considering what preferences they have or trying to realize the preferences.

Apart from regression lines, other calculations were made in order to complement the quantitative analysis. The responses of the surveyed were divided into three subgroups, depending on the final marks average. The first subgroup includes the responses of the persons who have the final marks average from 2 to 3, the second subgroup includes the responses of the people who have the average equal to 3 or 4, and the last subgroup includes the responses of the people with the average above 4. In these groups the mean value of responses in respective questions (wherein the outlier observations were omitted), medians and the most frequent values were calculated (Table 2). Subsequently, the mean deviation of the acceptable price of insurance from the expected loss value in a given question (or a standard deviation of a given probability from the probability guaranteeing that the premium's price equalizes with the expected loss value), medians and the most frequent values of these deviations were calculated (Table 3).

Table 2. Mean values of responses in respective questions (without the outlier observations), medians and the most frequent values divided according to the final marks average

	QUESTION 1(I)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean acceptable price of insurance (without the outlier observations)	1227.09 PLN	1233.61 PLN	1192.31 PLN
Median of the acceptable price of insurance	1000 PLN	1075 PLN	900 PLN
The most frequent accepted price of insurance	1500 PLN	600 PLN	600 PLN
	QUESTION 2(I)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean acceptable price of insurance (without the outlier observations)	1035.42 PLN	1064.69 PLN	1165 PLN
Median of the acceptable price of insurance	1000 PLN	1000 PLN	700 PLN
The most frequent accepted price of insurance	1000 PLN	600 PLN	600 PLN
	QUESTION 3(I)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean acceptable price of insurance (without the outlier observations)	1305.57 PLN	1235.15 PLN	1507.32 PLN
Median of the acceptable price of insurance	1100 PLN	1000 PLN	800 PLN
The most frequent accepted price of insurance	600 PLN	600 PLN	600 PLN
	QUESTION 1(II)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean acceptable price of insurance (without the outlier observations)	992.24 PLN	1023.50 PLN	977.89 PLN
Median of the acceptable price of insurance	1000 PLN	850 PLN	525 PLN
The most frequent accepted price of insurance	1000 PLN	300 PLN	300 PLN
	QUESTION 2(II)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean acceptable price of insurance (without the outlier observations)	1110.24 PLN	1254.42 PLN	1349.49 PLN
Median of the acceptable price of insurance	1000 PLN	1000 PLN	800 PLN
The most frequent accepted price of insurance	1500 PLN	600 PLN	600 PLN
	QUESTION 3(II)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean probability	0.377706	0.310299	0.276842
Median probability	0.4	0.2	0.15
The most frequent probability	0.5	0.1	0.1

Source: authors' work based on authors' own research.

Table 3. Mean deviation of the acceptable price of insurance from the expected loss value in a given question (or standard deviation of a given probability from the probability guaranteeing that the premium's price equalizes with the expected loss value), medians and the most frequent values of these deviations

	QUESTION 1(I)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean deviation from the expected value (without the outlier observations)	710.63 PLN	672.84 PLN	635.90 PLN
Median deviation	500 PLN	475 PLN	300 PLN
The most frequent deviation value	900 PLN	0 PLN	0 PLN
	QUESTION 2(I)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean deviation from the expected value (without the outlier observations)	561.81 PLN	545.09 PLN	653 PLN
Median deviation	400 PLN	400 PLN	200 PLN
The most frequent deviation value	400 PLN	0 PLN	0 PLN
	QUESTION 3(I)		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean deviation from the expected value (without the outlier observations)	789.11 PLN	686.03 PLN	948.78 PLN
Median deviation	550 PLN	400 PLN	250 PLN
The most frequent deviation value	0 PLN	0 PLN	0 PLN
	QUESTION 4		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean deviation from the expected value (without the outlier observations)	702.586207	728.21 PLN	680.53 PLN
Median deviation	700 PLN	550 PLN	225 PLN
The most frequent deviation value	700 PLN	0 PLN	0 PLN
	QUESTION 5		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean deviation from the expected value (without the outlier observations)	587.43 PLN	734.76 PLN	863.33 PLN
Median deviation	525 PLN	450 PLN	370 PLN
The most frequent deviation value	900 PLN	0 PLN	0 PLN
	QUESTION 6		
Final marks average	from 2 to 3	from 3 to 4	above 4
Mean probability deviation from the probability guaranteeing that the premium's price equalizes with the expected loss value	0.29316164	0.219851	0.198421
Median deviation	0.3	0.1	0.095
The most frequent deviation	0.4	0	0

Source: authors' work based on authors' own research.

If we paid attention only to mean values of responses, we would notice that the values do not become closer to the expected value as the final marks average grows. Likewise, if we look at the mean deviations from the expected values that are not at all lower among people with higher final marks average. Nonetheless, we look at the situation differently if we take into account medians and the most frequent responses. In particular, as a result of the analysis of the data included in Table 3 we note that deviations medians are always the lowest in the subgroup with the highest final marks average, as well as in the case of the most frequent values. In the subgroup that includes the information about the responses of the student with the worst marks, the deviations of the most frequent values are usually greater than 0, whereas in the other subgroups they are equal to 0.

The received results of the research, which aim to check whether the conducted survey may be a good tool that enables to understand insurance preferences of the surveyed, do not allow to draw unambiguous conclusions, however, it seems quite certain that the third question of the second round should be replaced by another one that enables the surveyed better understanding of the problem and which do not make them treat the question as a task.

Conclusions

The article's objective was to check if survey research results are not influenced by the fact that people instead of answering according to their real preferences concerning surveyed subject give answers that they suppose are correct or well seen by investigators. An attempt was made to assess the relationship between knowledge level measured by the final marks average and the responses to the questions included in the survey. It was found that on average the persons with a higher average did not give responses closer to the expected value. However, taking into consideration position statistics we may conclude that the standard deviation of the response from the expected value was lower among the persons who were better students.

The most apparent influence of the marks level is visible in the question regarding probability, which might suggest that it was perceived as a test question and should be changed so that the surveyed people would answer in accordance with their preferences and their responses would be consistent with how they would act in real situations (however, it is also likely that they apply the knowledge they acquired during studies in their lives and they would follow the criterion of the expected value).

The received results bring a conclusion that in case of some questions there is no relationship between the knowledge level measured by the final marks average and the respondents' responses. However, there are questions in case of which such a relationship exists. It provokes reflection that while formulating questions in similar surveys it is necessary to make them in the way that prevents the respondents (who are often students in similar research) from treating them as a task.

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POZIOM WIEDZY A ODPOWIEDZI UDZIELANE W BADANIACH ANKIETOWYCH. PRZYKŁAD ANKIETY BADAJĄCEJ PREFERENCJE UBEZPIECZENIOWE

Streszczenie

Jedną z najczęściej stosowanych metod pozyskiwania informacji o ludzkich zachowaniach i preferencjach używanych w finansach behawioralnych jest, obok eksperymentu, przeprowadzanie ankiet. Istnieje pewna niezgoda pomiędzy badaczami, jaką wartość badawczą stanowią wyniki badań ankietowych. Niektórzy całkowicie podważają ich wartość (np. Neill, Cummings, Ganderton, Harrison, McGukin, 1994), inni wykazują, że nie ma istotnych różnic między deklarowanymi w ankietach postawami a rzeczywistym działaniem (Dohmen, Falk, Huffman, Sunde, Schupp, Wagner, 2011). W prezentowanej pracy przedstawiono wyniki badań nad związkiem pomiędzy poziomem wiedzy studentów (mierzonym średnią ocen ze studiów) będących respondentami a odpowiedziami udzielanymi w ankiecie dotyczącej podejścia do ryzyka. Zweryfikowano hipotezę, że osoby z wyższym poziomem wiedzy, odpowiadając na pytania dotyczące preferencji ubezpieczeniowych, udzielają odpowiedzi bliższych wynikom, które można by otrzymać dzięki matematycznej kalkulacji.

Słowa kluczowe: finanse behawioralne, ankieta, eksperyment, pożądana wartość, prawdopodobieństwo, straty, ryzyko, składki na ubezpieczenie

JEL Codes: D110, D810

