(arqus) Arbeitskreis Quantitative Steuerlehre

Diskussionsbeitrag Nr. 121

August 2011

Jochen Hundsdoerfer /Christian Sielaff / Kay Blaufus /
Dirk Kiesewetter / Joachim Weimann

The Influence of Tax Labeling and Tax Earmarking on the Willingness to Contribute – A Conjoint Analysis

www.arqus.info

arqus Diskussionsbeiträge zur Quantitativen Steuerlehre

arqus Discussion Papers in Quantitative Tax Research

ISSN 1861-8944

The Influence of Tax Labeling and Tax Earmarking on the Willingness to Contribute – A Conjoint Analysis*

Jochen Hundsdoerfer, Christian Sielaff, Kay Blaufus,
Dirk Kiesewetter, Joachim Weimann

August 11

Abstract

We apply conjoint analysis to study the influence of tax labeling and tax earmarking on German taxpayers' willingness to contribute. From a survey based sample we show that labeling and earmarking effects can substantially increase participants' willingness to contribute, which results in a considerable deviation from a pure consumption maximizing behavior. Furthermore, we give an explanation for this effect regarding socio-demographic attributes of German taxpayers. These results explain the variety in tax labels and provide implications for tax policy regarding further reforms of the tax and contribution system: "Labeling" and "earmarking" of contributions are important instruments in "selling" policies and increasing tax revenue.

Keywords

Behavioral Taxation · Tax Labeling · Tax Earmarking · Willingness to Contribute · Conjoint Analysis · Perceived Tax Burden

JEL Classification

D03 · H20 · H51 · H52 · K34

---

* This is a revised version of our earlier working paper: „*The Name Game for Contributions – Influence of Labeling and Earmarking on the Perceived Tax Burden*", FACTS Discussion Paper, School of Business & Economics, FU Berlin, Nr. 2010/12.

Author of correspondence: Christian Sielaff, Department of Finance, Accounting and Taxation, Freie Universität Berlin, Garystraße 21, 14195 Berlin, Germany. E-mail: christian.sielaff@fu-berlin.de.

Contents

List of Tables

1. Introduction

Throughout the world taxes are labeled in creative ways. For example, taxes were named as “solidarity surcharge” for the former Eastern part of Germany, as “miner residential construction charges” or as a “fire brigade tax”. Other examples outside the tax system are state lotteries that are promoted to “help the children” or welfare payments for promoting social fairness. This paper provides empirical evidence as to whether these instruments decrease taxpayers’ resistance to taxation and increase the acceptance of different taxes and contributions.

Studies on the willingness to evade taxes have shown that many taxpayers seem to attach positive connotations to taxes and further contributions as long as these contributions are consistent with their own sense of fairness and they find the contributions reasonable. Therefore, the attributes of a contribution such as its labeling and its possible earmarking may influence the individual evaluation of this duty and the subjective willingness to contribute. This study applies conjoint analysis to measure the influence of labeling and earmarking on the willingness to contribute. Conjoint analysis as an empirical method gives study participants the opportunity to rank different combinations of attributes. This method was used to determine how the naming of a contribution (labeling) as well as its designated use (earmarking) affects the acceptance of this contribution in the population.

This question is both of theoretical and political relevance. For theoretical research, it is important to analyze whether the traditional assumption of net income maximizing behavior holds for tax labeling and earmarking and which instruments can influence this behavior. From a political perspective, knowledge of the effects of labeling and earmarking contributions could be used to explain the variety of tax systems as well as to increase the acceptance of tax systems and, where applicable, to minimize tax avoidance strategies and evasion behavior.

This article is structured as follows: Section 2 presents a short literature review. Section 3 discusses the conceptual framework as well as the used method and the data. Section 4 presents the main results of the study. The final section concludes by summarizing and discussing key findings.

2. Literature Review

The starting point of the tax earmarking discussion in modern public finance is Buchanan (1963). He analyzes the economic effects of earmarked taxes and their influence on the individual's behavior within a theoretical model. He also discloses differences between earmarking and general-fund financing under restrictive model assumptions. Based on his work, Goetz (1968) develops a modified model and shows that the normative conclusions become less determinate under less restrictive assumptions. McCleary (1991) extends the theoretical models with World Bank case studies. He comes to the result that earmarking does not work very well in real settings. Durand, Klemmack and Lee Roff (1982) use cluster analyses to segment the respondents of a survey regarding their priorities for federal expenditures. They argue that the preferences for various expenditure programs differ on the basis of demographic and social psychological differences between the respondents and suggest the development of communication programs to inform the public about programs and goals in a more efficient manner. Based on these results, our study analyzes how the acceptance of a contribution is influenced by the information on its label and its earmarking. Furthermore, we analyze relevant demographical attributes to explain a potential increase in acceptance.

The effects of labeling and earmarking taxes are often discussed in papers that address the incentives of tax evasion. The focus of many studies is the impact of the public use of taxpayers' money on the willingness to evade taxes. Schmölders (1959), with further references, presents the results of a survey in Germany regarding general tax-mindedness and the moral assessment of tax dodging. He comes to the result that most respondents do not see tax dodging as a criminal activity and do not differ between taxes, voluntary contributions and fees. Kolm (1973) provides a basis for this in that he explicitly integrates the utility of public goods, which were financed through taxes involved in tax evasion decisions in an evasion model. Vogel (1974) determines through surveys that, in Sweden, the willingness to evade taxes decreased when the tax payment was accompanied by a certain consideration. Lewis (1979) reaches similar conclusions for Great Britain. Van de Braak (1983) offers a theoretical framework for the definition of tax resistance and discusses findings about tax compliance and tax mentality. Baldry (1986) shows that a difference between gambling and tax evasion is the existence of 'moral costs' in a situation deciding on the latter.

For a detailed survey about tax morale, see Torgler (2002) and Alm et al. (1995). Furthermore, experiments conducted by Spicer and Becker (1980) as well as Fortin et al.

(2007) show that the willingness to evade taxes decreases the higher the degree of the perceived tax justness and tax fairness. A model theoretical explanation for this is provided by Cowell (1992). Feld and Tyran (2002) conduct a laboratory experiment and come to the result that the higher the participants estimate the tax compliance of others to be, the higher their own tax morale. Alm, McClelland and Schulze (1992) come to the conclusion that individuals exhibit a great deal of diversity in their behavior towards taxation. They further determine that the main reasons for tax compliance are the overweighting of the low probability of audit and the taxpayers' valuation of public goods. Kim, Evans and Moser (2005) give a comprehensive explanation of the tax-reporting decisions and why they cannot be predicted accurately by conventional economic analysis. Harbaugh, Mayr and Burghart (2007) show that both required contributions and voluntary payments to a non-profit organization lead to similar brain activity amongst test persons as payments in their favor. In this observation, the authors see confirmation both for the motive of pure altruism and the motive of a "warm glow of giving", which is the benefit that the test person receives through his/her own voluntary donation.

A related body of literature attempts to measure subjective tax effects of contributions and subjective judgments of their fairness. According to Frey and Eichenberger (1996), the opportunity for taxpayers to participate in political tax questions is sufficient to increase tax satisfaction. These results are also verified by the results of Feld and Tyran (2002), who confirm a positive correlation between political participation and tax compliance. A detailed survey about tax fairness and tax justice is provided by Kirchler (2007) with further references.

Recently, the labeling and earmarking effect has become more and more important in both the economic and the psychological literature. Löfgren and Nordblom (2009) show that labeling can significantly affect attitudes towards a tax. According to their survey conducted in Sweden, a gasoline tax meets a stronger reluctance than the same tax when it is labeled as CO_2 tax on gasoline. Hardisty et al. (2010) analyze the effect of attribute framing on choice, labeling charges for environmental costs as either an earmarked tax or an offset. They find that the effect of attribute labeling depends on different political affiliations.

The general behavioral economics literature dismisses the usual assumptions made in economics about individual preferences. The basic deviations are that individuals act imperfectly rationally and that they hold non-standard preferences. Congdon et al. (2009) analyze the implications of behavioral economics for tax policy. They find that the welfare

consequences are ambiguous if taxpayers do not decide rationally. For example, people are not only self-interested but also care about the welfare of others (Andreoni and Miller 2002).

McCaffery and Baron (2006) with further references report findings of several experiments about perceptions of various tax-law design aspects. They come to the result that politicians can manipulate public opinion by tax system design, for example by using a “bonus” instead of a “penalty” (see Schelling 1984, p. 19 f.).

Based on the assumptions of behavioral economics literature this study explains the deviations from net income maximizing and pure self-interested behavior of taxpayers by analyzing the influence of tax labeling and tax earmarking. Our study shows that taxpayers’ behavior deviates systematically and considerably from consumption maximization.

This study builds upon previous results and enhances the status quo of research in two ways. On the one hand, we explicitly distinguish between a labeling and an earmarking effect on the willingness to contribute. On the other hand, we use conjoint analyses as a new method for this field of research to determine the willingness of German taxpayers to contribute. Conjoint analysis, well known in psychological and marketing research, is superior to survey based studies in the analysis of the willingness to contribute.

3. Conceptual framework

3.1 Research hypothesis

The reference point of our analysis is a taxpayer who aims to maximize his net consumption potential (called “reference” in the following). This net income maximizing behavior builds the initial point for evaluating the influences of labeling and earmarking on the willingness to contribute. The study does not aim to test the rational and self-interested “*homo oeconomicus*” model but rather to explore preferences for different tax policies and the influence of labeling and earmarking on that.

We consider three kinds of contributions: Income tax, health insurance premium and education allowance. The individual consumption potential is reduced by each of these contributions. In our analysis, each contribution may be low or high. Each possible combination of these contributions presents a treatment for the conjoint analysis. The specific contributions in our analysis have no direct monetary influence on the taxpayer’s net income, either because such direct considerations do not occur (income tax, education allowance) or

because their amount is explicitly assumed to remain unchanged (health insurance coverage). Thus, a pure net income maximizer would prefer low contributions.

According to this hypothesis, the name of a contribution (labeling) cannot influence the taxpayer's willingness to contribute because he aims to maximize his net income. Any potential statement of the designated use (earmarking) cannot affect the willingness to contribute as long as it deals with a matter in which the particular contribution amount does not directly increase the taxpayer's consumption potential.

The initial hypothesis under the assumption of a net income maximizer is stated as follows:

H_1: For a given gross pay amount and given consideration from the system of contributions, taxpayers will choose the net income maximizing combination from a set of different combinations.

Now the contra thesis to H_1 must be developed. The subjective willingness to contribute, and thus the decision between combinations of contributions, could be influenced by the *labeling* of a contribution. Whereas in net income maximization, every type of contribution burden that causes a decrease in the individual consumption potential should be avoided, taxpayers could in reality factor the labeling of a contribution into their net burden calculations and with that, also into their decisions, even if their own consumption potential decreases in the process.

In addition to the egoistic behavior, the target function is now extended to include a limited egoistic or even an altruistic motive. A contribution labeled for example as a general education allowance could therefore receive wider acceptance among taxpayers than a contribution labeled as a tax if, for instance, taxes are associated with wastefulness by many taxpayers. The first contra thesis to H_1 reads as follows:

H_2: The labeling of a contribution influences the willingness to contribute and therefore, the selection of taxpayers between combinations of contributions.

However, at this juncture, one must consider that the pure labeling of a contribution (e.g., education allowance) does not initially reveal anything about the concrete use of this contribution. The general labeling education allowance does not state whether the revenues from this contribution will be used, for example, to fund schools, universities, or general education projects such as community colleges, libraries, or museums. Certainly, this assumption holds only for a "one-shot-game". In the long run, taxpayers are able to observe if the money has been used according to the initial pledge of the government and this will

definitely influence the taxpayer's choice for the following rounds. Based on this study, further research should analyze the long run influence of labeling. In this study, only a "one-shot-game" is assumed.

The other tested contra thesis pertains to the appropriation (earmarking) of a contribution. Taxes are – in contrast to social contributions – usually not provided with appropriations (Non-Earmarking Principle, see e.g., McCleary 1991, p. 82). However, a non-enforceable political "pledge" could be given for a particular allocation of funds. In this way, appropriations would be possible for social contributions as well as for taxes.

It is questionable whether an appropriation can increase the acceptance of a contribution (McCleary 1991, p. 85). If taxpayers consider a particular cause for which a contribution is designated especially worthwhile, then they might be willing to accept a decrease in their consumption potential in order to support this cause. A similar behavioral pattern arises, for instance, concerning the willingness to give donations to non-profit organizations or particularly worthy causes. Accordingly, wage earners could, instead of choosing the alternative which offers them the highest net income, intentionally relinquish a portion of their consumption potential in order to support an allocation of funds that they consider worthwhile, without receiving a concrete service in return.

In this study, the study participants were divided into two groups to model the appropriation and the concrete use of the education allowance. One of these groups did not receive any detailed information regarding the use of the education allowance. The other group was informed about the concrete use of this contribution: Fifty percent of the education allowance was to be dispersed to schools and vocational schools, 25% to colleges and universities, and 25% to preschool education, since it was expected that the eligibility for the financing of this cause would, in general, be viewed positively by the population.

Two different conjoint analyses were conducted:

- In the first conjoint analysis, study participants were explicitly told that the tax revenue from the tested contribution (education allowance) was not earmarked. In this setting, solely a labeling effect was to be active.
- In the second conjoint analysis an earmarked education allowance was tested. In this case, both a labeling effect and definite earmarking were present.

This approach leads to the proposition of an additional sub-hypothesis as well as a contra hypothesis to H_1:

H_3: The earmarking of a contribution influences the willingness to contribute and therefore, the selection of taxpayers between combinations of contributions.

The two influential factors studied, labeling and earmarking, are not completely free from overlap, since the name of a contribution could be understood by taxpayers as a signal for the appropriation. However, it is possible to differentiate between a contribution with "lower" appropriation (solely by labeling of the contribution) and a contribution with "higher" appropriation (by a promised use): How does a "vague signal" for a possible appropriation (e.g., solidarity surcharge in Germany) act compared to clearly signaled earmarking, which is certain upon introduction of the contribution?

3.2 Method

The testing of the hypotheses mentioned above was carried out based on two conjoint analyses. A conjoint analysis consists of a procedure that was originally developed in the field of psychology (Luce and Tukey 1964) and later also found widespread use in market research (Green and Srinivasan 1978, pp. 103f.). In a conjoint analysis, study participants are assigned the task of evaluating various *bundles of attributes* ("stimuli") according to their preferences (CONsider JOINTly), either by explicit evaluation (*rating*) or by indicating an order of precedence based on advantageousness (*ranking*). A bundle of attributes contains independent *factors* whereby each factor is described by a specific value called *level*. It is a multivariate technique and based on the premise that subjects evaluate the value of an object by combining the separate amounts of value provided by different attributes. The most fundamental concept and the conceptual basis for measuring value in conjoint analysis is the utility, a subjective judgment of preference unique to each individual (Hair et al. 2008, p. 266). The measured total utility of the various bundles of attributes are used to calculate part worth utilities and the relative importance of the single attributes. A conjoint analysis also consists of a decompositional procedure, which generally assumes an additive relationship of the part worth utilities with regard to the total utility (Hair et al. 2008). The advantage of the procedure is that study participants can holistically evaluate the objects to be analyzed, such that the demands on the study participants are lower and biases due to cognitively directed over/under weighting can be avoided. As a result, the conjoint analysis can be used to split up the total utility of a bundle of attributes into the part worth utilities of the individual attributes

and their relative weights. Since, in a conjoint analysis, the study participants have to give a simultaneous evaluation of different attributes, they must consider the same trade-off effects between the individual attributes that also exist in reality. [1]

It would also be conceivable to directly question the study participants regarding willingness to contribute. However, the majority of study participants were not in a position to give consistent estimates of the burden which also take such trade-off effects into account. The study participants would probably tend to rate all attributes as especially important and therefore, overestimate the individual attributes in a bundle of attributes. The procedure of conjoint analysis was therefore chosen since it sets much lower demands on the study participants.

We consider that conjoint analyses are an applicable method for tax issues because of the advantages named above. In the field of marketing research, the conjoint analysis has been a standard method for several years. To this point, for tax issues, the application area of conjoint analysis is limited, but a conjoint analysis has already been used sporadically to measure tax effects. Milliron and Toy (1988) adopt conjoint analysis to research influential factors with regard to tax compliance. Hundsdoerfer and Sichtmann (2009) investigate the influence of taxation on investment decisions with the help of conjoint analysis. Blaufus and Ortlieb (2009) study the influence of tax complexity on employee decisions regarding company pension plans. To our knowledge, conjoint analysis has not yet been used to measure the influence of labeling and earmarking on the subjective burden of this contribution.

3.3 Sample

The data collection took place in December, 2008, and January, 2009, in the form of standardized face-to-face interviews with specially trained interviewers. In addition to the conjoint analysis, further questions were asked regarding demographic attributes, the general assessment of fiscal policy, and individual knowledge of German income tax law. The survey lasted an average of 20 minutes per study participant. Study participants were selected from among gainfully employed individuals, since these persons could be considered as being burdened by taxes and other contributions and thus, have experience with the German system of contributions. Gainfully employed individuals include, for purposes of this survey, all

[1] A *partition dependence effect* is avoided by using a complete stimuli design containing all possible combinations of attributes. See Fox et al. (2005, p. 539) for further details.

employees, public officials, and self-employed workers. Short interruptions to employment, for instance due to parental leave, maternity leave, etc. were not problematic.

The selection of study participants followed a quota schedule[2] which corresponded pro rata with the total working population in terms of the attributes of gender, age, education, and income level. The corresponding frequency in the population for the year 2006 was taken from the 2008 statistical almanac from the Federal Statistical Office in Germany, in which 37 million people comprised the working population in Germany. This was done to avoid bias from a non-representative composition of the sample since a representative random sample was not possible for financial reasons.

The conjoint analysis was conducted with a total of 542 study participants. This group was divided into two subgroups: 274 study participants (non-earmarking group) received no additional information about the appropriation of the contribution "education allowance", whereas 268 study participants (earmarking group) received additional information regarding the concrete use of the contribution. Compliance with the quota schedule was statistically tested. No significant difference between sample and population could be detected at the 5% level of confidence, and the sample can therefore be seen as representative in regard to the studied traits. The majority of the interviews took place in Berlin and its surroundings. We controlled for differences between study participants from the former Western and Eastern Germany. More than twenty years after the end of the German division, we did not find differences between these groups in the data set. In addition, no significant difference could be identified between the two groups in the sample (non-earmarking group and earmarking group) with respect to the quota schedule at the 5% level of confidence.

The sample is composed of the individual attribute traits as follows:

[2] Quota samples do not strictly fulfill the requirements of a pure random selection. Nevertheless, they are the most widely used procedure in marketing research and consistently yield good results in comparative studies with pure random selection (see Green et al. 1988, pp. 325-327).

Table 1 - Distribution of Quota Attributes

Attribute	Value	Frequency	Percent (sample)	Percent (population)
Gender	Male	291	53.7 %	54.8 %
	Female	251	46.3 %	45.2 %
Age	Under 20 Years	20	3.7 %	3.5 %
	20 – 29 Years	93	17.2 %	17.5 %
	30 – 39 Years	127	23.4 %	24.0 %
	40 – 49 Years	152	28 %	29.6 %
	50 – 59 Years	115	21.2 %	20.5 %
	Over 60 Years	35	6.5 %	5.1 %
Education[3]	No School Leaving Certificate	11	2.0 %	2.2 %
	Lower Secondary School Leaving Certificate	152	28.0 %	31.4 %
	Secondary School Leaving Certificate	148	27.3 %	26.8 %
	University-Entrance Diploma	86	15.9 %	14.5 %
	University Degree	101	18.6 %	16.0 %
	Other	44	8.1 %	9.1 %
Monthly Net Income	Under 1,000 Euro	164	30.3 %	32.7 %
	1,000 – 2,000 Euro	253	46.7 %	44.8 %
	2,000 – 3,000 Euro	82	15.1 %	14.6 %
	Over 3,000 Euro	38	7.0 %	8.0 %
	Not Stated	5	0.9 %	---

[3] Lower Secondary School is the equivalent to the German “Hauptschule” while Secondary School is equivalent to the German “Realschule” and University-Entrance Diploma is equivalent to the German “Abitur”.

3.4 Operationalization of the Hypotheses

The research objects consist of a combination of contributions which must be paid by the study participants. The study participants were placed in a fictitious situation in which they were asked to rank[4] combinations of contributions according to their preferences in determining the fiscal policy for an (unnamed) political party.[5] The stimuli were presented to the study participants simultaneously on a table in front of them to make sure that the respondents fully understood and considered all the alternatives.

Every possible combination assumed a constant gross pay of 3,000 Euro. This gross pay was then reduced by three different contributions, i.e., deductions (factors). These deductions included a general income tax, a health insurance premium, and a newly introduced educational allowance. The factor levels were 700 or 740 Euro for income tax, 200 or 280 Euro for compulsory health insurance premiums, and 0 or 60 Euro for the education allowance. We explicitly advised the study participants that the health insurance premiums are independent of their actual received health insurance payments. Due to this advice our reference taxpayer will not pay a higher health insurance premium, independent of whether the taxpayer places some value on health benefits.

The net pay was also given for each stimulus to prevent arithmetic errors from distorting the study participants' results. There were a total of eight different possible combinations in the study (complete design), which were to be ranked by study participants during the course of the analysis according to their preferences. Each stimulus received a different level combination of the three factors (income tax, compulsory health insurance, education allowance).

The individual contribution combinations of the stimuli in the complete design are presented in Table 2.

---

[4] This ranking is the most common valuation procedure after the rating scale. An overview of various procedures can be found in Green and Srinivasan (1978, pp. 104f).

[5] To avoid a political party framing effect the name of the political party was unspecified.

Table 2 - Contribution Combinations of Stimuli in Complete Design

Stimulus	Income Tax	Education Allowance	Premium for Compulsory Health Insurance
A	low = 700 €	no	low = 200 €
B	low = 700 €	yes (60 €)	high = 280 €
C	high = 740 €	yes (60 €)	low = 200 €
D	high = 740 €	no	high = 280 €
E	high = 740 €	no	low = 200 €
F	low = 700 €	yes (60 €)	low = 200 €
G	high = 740 €	yes (60 €)	high = 280 €
H	low = 700 €	no	high = 280 €

The study participants were asked to assign the lowest rank in the sequence to the stimulus with their highest preference and the highest rank to the stimulus with their lowest preference. After a study participant had completed the sequence, the interviewer once again mentioned the possibility of making changes. When the study participant did not wish to make further changes, the final sequence was documented by the interviewer. The use of the education allowance was not stipulated in the first conjoint analysis (non-earmarking). In this case, explicit information was given to the study participants that tax revenue from the education allowance went into the general national budget and was not earmarked. In the second conjoint analysis (earmarking), study participants received detailed information regarding the use of the education allowance: Twenty-five percent of revenues from the education allowance were to be used for preschool education in nursery schools and day-care centers for children, 25% for improvements to colleges and universities, and 50% for improvements to schools and vocational schools. The sequences we collected can be used to test the initial hypothesis (hypothesis H_1). Each sequence created by a study participant can be compared with the reference sequence that a net income maximizing individual would choose in order to maximize his/her net income.

4. Results

4.1 Analysis of Ranking Behavior

The reference model of a net income maximizing individual provides a reference point for the examination of the empirically observed rank order of the preferred contribution system. This net income maximizing decision maker will always aim to minimize his/her contribution burden and therefore, maximize his/her net income.

Table 3 shows the total contributions and the maximum attainable net income of the individual stimuli.

Table 3 - Total Contributions and Net Income

Stimulus	Total Contributions	Net Income
A	900 €	2,100 €
B	1,040 €	1,960 €
C	1,000 €	2,000 €
D	1,020 €	1,980 €
E	940 €	2,060 €
F	960 €	2,040 €
G	1,080 €	1,920 €
H	980 €	2,020 €

If one ranks the stimuli according to the maximum attainable net income, this results in the following reference sequence

$A \succ E \succ F \succ H \succ C \succ D \succ B \succ G$,

since in this case, the stimulus with the highest net pay is ranked in first place and the ranking of the stimuli follows the total contributions.

In order to check how many study participants followed the example of the net income maximizing decision maker, Table 4 provides an overview of the number of net income maximizing sequences in the total sample.

Table 4 - Reference Sequence

Ranking	Number of Study Participants	Percentage of Study Participants
Reference	142	26.2 %
Other	400	73.8 %

Table 4 shows that the vast majority of study participants decided against a net income maximizing sequence. This result cannot be caused by arithmetic errors, since the exact net pay (gross pay – contributions) was indicated for every stimulus. Thus, net income maximization simply required the sorting of the stimuli according to net pay. Only 26.20% (142 individuals) of the study participants ranked all of the stimuli according to the reference rank order. A total of 73.80 % (400 individuals) instead chose another sequence. A t-test confirms that the deviations from the reference behavior are statistically significant (p-value < 0.01).

Table 5 shows the rank placement of the individual stimuli in the total sample:

Table 5 - Average Rank Placement of the Individual Stimuli

Stimulus	N	Median	Mean	Standard Deviation
Stimulus A (L-L-L)	542	1	2.63	2.090
Stimulus B (L-H-H)	542	7	5.38	2.067
Stimulus C (H-H-L)	542	5	4.01	1.645
Stimulus D (H-L-H)	542	6	6.29	1.426
Stimulus E (H-L-L)	542	3	3.79	2.049
Stimulus F (L-H-L)	542	3	2.75	1.641
Stimulus G (H-H-H)	542	8	6.56	1.966
Stimulus H (L-L-H)	542	4	4.58	1.557

The mean value is of particular interest. The mean indicates the average rank placement of a stimulus over the total sample. According to this average rank placement, we have the following sequence of stimuli:

A≻F≻E≻C≻H≻B≻D≻G.

From Table 5, it becomes apparent that:

- Stimulus A has the lowest mean and therefore, on average, the best rank placement. This reflects the behavior of a net income maximizer. The same is true of stimulus G, which was valued as being the worst, both in net income maximization and on average in the sample.
- The sequence of stimuli according to the average of the study participants (mean) deviates from the sequence of stimuli in net income maximization. This leads to the assumption that the study participants do not follow the principle of net income maximization in their decision making.

Therefore, the behavior of the decision maker cannot be explained or predicted using the assumption of a *pure net income maximizer*. Thus, Hypothesis H_1 can be rejected. A further step must be used to test to what extent this deviation can be explained through the labeling of the contribution "education allowance" and the contribution "health insurance premium" (hypothesis H_2) as well as the earmarking of the contribution "education allowance" (hypothesis H_3).

4.2 Influence of Labeling

4.2.1 Education Allowance

According to hypothesis H_2, the labeling of a contribution leads to a change in the willingness to contribute and therefore, to a shift in contribution preferences. Thus, a contribution labeled as an "education allowance" should, according to hypothesis H_2, be evaluated differently by study participants from other contributions in a system of contribution combinations. Labeling the contribution as an "education allowance" affects the willingness to contribute twice. First the contribution is labeled as an "allowance" and not as a "tax". Second, the label "education" suggests the designation for education purposes. In hypothesis H_2, we consider that this label increases the willingness to contribute. In order to eliminate bias in the effect of labeling, which is caused by the explicitly named appropriation of the education allowance (earmarking), the influence of labeling was first analyzed separately within the non-earmarking group.

Conjoint analysis makes it possible for each study participant to measure the part worth utilities of the individual attributes for his/her own sequence. Therefore the differences between the average of all ranks and the empirical ranks for each factor value were calculated.

This difference is the part worth utility of an individual factor level, which was standardized for comparison. The part worth utility is therefore a measure of the value that a study participant attaches to a factor level within the total attribute bundle. The estimation procedure is analogous to multiple regressions with dummy variables, but the calculations are done for each respondent separately, and it differs from other techniques dealing with relationships across all respondents. (For detailed information about the estimation technique see Hair et al. (2008 p. 269)). In this conjoint analysis, the part worth utility represents the utility that a study participant assigns to a contribution in a certain amount. The part worth utilities are used to cause a deviation in the individual willingness to pay a contribution. A high part worth utility denotes a high willingness to pay a contribution compared with the total willingness to pay the bundle of contributions.

As a means of comparison, the part worth utilities of the attributes could also be measured for a net income maximizer who ranks the stimuli solely according to the attainable net pay (Hundsdoerfer and Sichtmann 2009). In this way, we can test whether study participants assign a systematically higher value to the factor level "education allowance is levied" as it would be the case in the reference model. The correlation between the total utility of a stimulus and the individual part worth utility is – as is customary in conjoint analysis – assumed to be additive. This means that the sum of the individual part worth utilities of the attributes of a stimulus corresponds to the total utility.[6] Table 6 shows the standardized[7] part worth utilities and relative significance that result from the sample[8] as well as the respective values in a reference sequence:

[6] This conclusion is based on the assumption that the explanatory variables do not interact, see Hair et al. (2008).

[7] The part worth utilities were standardized on a uniform scale of measurement and with a uniform zero-point.

[8] The sample here refers only to the non-earmarking group.

Table 6 - Part Worth Utilities and Relative Significance (Non-Earmarking Group)

	Standardized Part Worth Utility (in %)		Relative Significance (in %)	
	Reference	**Sample**	**Reference**	**Sample**
Income Tax high	0.00	1.12	20.00	20.86
Income Tax low	20.00	19.74		
Education Allowance	0.00	12.92	33.33	40.21
No Education Allowance	33.33	27.29		
Health Insurance high	0.00	1.53	46.67	38.93
Health Insurance low	46.67	37.40		

In particular Table 6 shows that the part worth utilities for the education allowance in the sample deviate from the part worth utilities of the net income maximizing reference model. These results can be interpreted as follows: Whereas the characteristic "no education allowance" of a stimulus for our reference study participant accounts for 1/3 (33.33%) of the maximum total utility, this is only 27.29% for the average study participant.[9] This result suggests that a contribution declared to be an education allowance finds wider acceptance than income tax.

A total of 76 of the 274 study participants in this part sample (non-earmarking group) preferred stimuli that levied the education allowance, so the part worth utility (mean) for the attribute "education allowance is levied" is at 12.92% and so clearly greater than for the reference point (part worth utility for this factor level = 0). Across all study participants, the difference between the part worth utility mean of the attributes "no education allowance" and "education allowance is levied" (27.29%-12.92% = 14.37%) showed that an increase in the education allowance from 0 to 60 € would burden the study participants to a lesser degree than would an increase in income taxes of 40 € (difference = 19.74% - 1.12% = 18.62%). This result shows that the willingness to pay the high education allowance is higher than the willingness to pay the high income tax. A t-test confirms the statistically significant deviation of the part worth utility for the factor level "education allowance is levied" from the reference value (p-value < 0.01).

[9] For a rational, self interested study participant any label itself is without any importance, only the increase in net income for the characteristic "no education allowance" is important.

Thus, in the evaluation of the attribute “education allowance is levied”, many study participants apparently include not only the decrease in their consumption potential, but also attach positive importance to the promotion of education.

If study participants were willing to pay the education allowance and to relinquish a portion of their net income irrespective of how high the additional expenses were, then the sequence selected by these study participants would appear as follows:

F≻C≻B≻G≻A≻E≻H≻D.

Here the sequence of the study participants corresponds to the reference sequence (net income maximizing) in regard to the attributes income tax and health insurance. However, the stimuli with the factor level “education allowance is levied” occupy the first four places. It’s a matter of an extreme case of endorsement for the education allowance. Table 7 reflects the frequency of this sequence compared to the reference sequence for the non-earmarking group (NE):

Table 7 - Sequences “Pro Education Allowance” with Non-Earmarking

Ranking	Number of Study Participants (NE)	Percentage of Study Participants (NE)	Total Sample
Reference	80	29.20 %	142 (26.20%)
Pro Education Allowance	14	5.11 %	47 (8.67%)
Other	180	65.69 %	353 (65.13%)
Sum	274	100.00 %	542 (100.00%)

Table 7 shows that a total of 14 out of 274 study participants are willing to pay the education allowance. A binomial test can also be used to show that the number of sequences carried out in this form present no statistically random result. Therefore, it can also be proven that a significant percentage of study participants intentionally chose the strategy “pro education allowance” instead of “contribution minimization” and therefore, chose the contributions with additional expenses. This clearly already appears sufficient to provide a contribution with a positive description. Hypothesis H_2 is therefore confirmed for the education allowance: The willingness to pay a contribution depends upon its labeling.

4.2.2 Health Insurance Premium

In addition to the previously established positive influence of the label "education allowance", we analyzed whether the labeling of a contribution as "health insurance premium" influenced the willingness to contribute in contrast to a general income tax. In order to study this aspect, we divided the sample into two subgroups. We sub-divided each data set in such a manner as if the study participants had ranked each individual stimulus with an education allowance and without an education allowance. Therefore, two fictitious conjoint analyses per study participant were generated, each with four stimuli, in which only the attributes "income tax" and "health insurance premium" were varied and the education allowance remained constant (in one case 60 Euro and in the other case 0 Euro). So the labeling effect of the health insurance premium compared to the income tax could be isolated.

The calculated part worth utilities can be taken from Table 8.

Table 8 - Part Worth Utilities separated by Groups "Education Allowance" and "No Education Allowance"

Group Allocation	Income Tax low	Income Tax high	Health Insurance low	Health Insurance high
Education Allowance	31.86%	3.32%	61.75%	3.08%
No Education Allowance	37.64%	1.60%	56.15%	4.61%
For Comparison: Net Income Maximization	33.33%	0.00%	66.67%	0.00%

The willingness to pay the health insurance premium is noticeably higher in both groups than it would be under net income maximization.[10] Thus, the term "health insurance premium" seems to be positive in comparison to income tax, or the study participants have – in contrast

[10] The margin between low and high income tax is 40 Euro, which is half of the margin between the low and high health insurance premium. Accordingly, under net income maximization the part-worth utilities of the low income tax is half as high as for the low health insurance. For a comparison between the willingness to pay the health insurance premium and the income tax, the part worth utilities of the low income tax can be doubled. Then one recognizes – especially in the case without education allowance – the willingness to pay a higher health insurance premium is higher than to pay a higher income tax.

to the information that they received from us – associated a higher reward from compulsory health insurance with a higher health insurance premium.

When the study participants were confronted with an education allowance (group "education allowance"), then the willingness to pay a high health insurance premium is less than in the case in which no education allowance is collected. For study participants who are more strongly burdened by a higher health insurance premium than through a low one (the normal case), we see a difference of 4.35 percentage points.[11] The economic intuition behind this result is obvious: If study participants are willing to pay for an education allowance, then their inclination to "voluntarily" pay a higher health insurance premium decreases. This result was controlled with a Wilcoxon-Mann-Whitney Test and is significant on a 10% level of confidence. Therefore, a labeling effect can also be determined for the health insurance premium. This effect diminishes when an education allowance exists simultaneously.

4.3 Influence of Earmarking

It was shown above that the labeling of a contribution can change its acceptance among study participants. It is doubtful whether this effect is affected when study participants are explicitly informed of the purpose for which this contribution is to be used. The additional revenue generated by this increase in contributions should be explicitly assigned a previously determined use (earmarking). As mentioned above, a subgroup of study participants were given additional information for this purpose. Study participants in this subgroup were explicitly informed of the use of the education allowance.

The following part worth utilities resulted for the study participants who received this additional information. For comparison, the reference values as well as the results of the non-earmarking group are listed in Table 9.

[11] In order to be able to subtract the part worth utilities for the health insurance premium from one another, we excluded the study participants who had chosen a high health insurance premium over a low health insurance premium ("reversals"). For the low education allowance (N=504), one received a part worth utility of the low health insurance premium of 60.38%, and for the high education allowance (N=517), a part worth utility of 64.73%. The number of reversals for a low education allowance (542-504=38) is higher than for a high education allowance (542-517=25), and this also supports the results.

Table 9 - Part Worth Utilities and Relative Significance (Earmarking Group)

	Part Worth Utility			Relative Significance		
	Reference	**Non-Earmark**	**Earmark**	**Reference**	**Non-Earmark**	**Earmark**
Income Tax high	0.00 %	1.12 %	0.76 %	20.00 %	20.86 %	21.28 %
Income Tax low	20.00 %	19.74 %	20.52 %			
Education Allowance	0.00 %	12.92 %	24.54 %	33.33 %	40.21 %	41.82 %
No Education Allowance	33.33 %	27.29 %	17.28 %			
Health Insurance high	0.00 %	1.53 %	1.38 %	46.67 %	38.93 %	36.90 %
Health Insurance low	46.67 %	37.40 %	35.67 %			

In order to test whether there is a significant difference between the distribution within the earmarking and non-earmarking groups with regard to the acceptance of the education allowance, a Wilcoxon-/Mann-Whitney-U-Test was conducted. At a level of confidence less than 0.001%, the test showed that there is a significant shift in the distribution function between the two groups. In particular, the mean value of the part worth utility in the non-earmarking group is 12.9% and in the earmarking group 24.5%. As such, the appropriation leads to an average increase in the part worth utility of an education allowance of 11.6%. With that, the individual willingness to contribute for the education allowance is significantly higher if the study participants were informed about the specific appropriation for the contribution. Therefore hypothesis H_3 is confirmed: The appropriation of a contribution has an influence on the willingness to pay this contribution. The average willingness to pay the contribution “education allowance” increases further if the study participants are convinced of its validity not only through the labeling of the contribution, but also through its earmarking.

In our study, the effect is so strong that – with earmarking – the education allowance no longer presents a net burden. This is shown in Table 9: The mean value of the part worth utilities of the high education allowance is more than 7 percentage points *higher* than the mean value of the part worth utilities of the low education allowance. Therefore, the high education allowance creates a higher total utility on average in the “earmarking” group than the low education allowance.

Table 10 serves to clarify how many study participants in the earmarking group (E) consciously chose the high education allowance, but otherwise behaved as a net income maximizer.

Table 10 - Sequence "Pro Education Allowance" with Earmarking

Ranking	Number of Study Participants (E)	Percentage of Study Participants (E)	Total Sample
Reference	62	23.13 %	142 (26.20 %)
Pro Education Allowance	33	12.31 %	47 (8.67 %)
Other	173	64.55 %	353 (65.13 %)
Sum	268	100.00 %	542 (100.00%)

If one compares these results with the values in Table 7, it becomes clear that, in the earmarking group, a strikingly larger number of study participants chose the "pro education allowance" but otherwise chose the reference sequence (12.31%). This also confirms the hypothesis that the willingness to pay can be increased through the earmarking of a contribution. Thus, hypothesis H_3 is also confirmed: In addition to the labeling of a contribution, the willingness to pay a contribution can be increased further if the contribution is earmarked for a special use, which appears to be seen as especially worthwhile by numerous study participants.

4.4 Influence of Individual Attributes

In order to test to what extent demographic data can explain the results, different non-parametric test methods were carried out in which the dependent variable consisted of the part worth utility of a levied education allowance. Nonparametric test methods are appropriate because of the quality of the data. We separated the sample into different classes with respect to the education level, age, gender, children and income. We then tested each class against the other for differences with respect to their part worth utility for the high education allowance. As test methods the Wilcoxon-Mann-Whitney-Test for two class comparisons and the Kruskal-Wallis-Test for testing more than two classes are applied. Table 11 provides an overview of the studied influence factors.

Table 11 - Explanation of the Labeling Effect with respect to individual attributes

Test classes	Test method	Results
Earmarking vs. Non-Earmarking	Wilcoxon-Mann-Whitney-Test	p<0.001***; Earmark: Mean: 12.92%; 95% Konf.: 10.1-15.75%; Non-Earmark: Mean: 24.54%; 95% Conf: 21.07-28.00%
Education level (at least University-Entrance Diploma vs. Secondary School Leaving Certificate and Lower Secondary School Leaving Certificate)[12]	Kruskal-Wallis-Test (and pairwise Wilcoxon-Mann-Whitney-Tests)	p=0.029**
Income level (<1000; -2000; -3000; >3000)	Kruskal-Wallis-Test	not significant
Age (<=20; -30; -40; -50; -60; >60)	Kruskal-Wallis-Test	not significant
Gender	Wilcoxon-Mann-Whitney-Test	not significant
Children	Wilcoxon-Mann-Whitney-Test	not significant

Other than for the attribute earmarking, no significant influence of the demographic attributes on the willingness to pay the education allowance with the exception of the education level can be determined. Solely the attribute “Lower Secondary School” allows the conclusion to be drawn at a 5% level of confidence that students at a lower secondary school tend to be less willing to voluntarily pay for education than students with at least a University-Entrance Diploma.[13] It is conspicuous that the test for the class “children” is not significant: We expected that those who have children may regard an education allowance as a positive benefit, which affect the perceived consumption possibilities for the family. However, no significant differences between taxpayers with and without children regarding the acceptance of the “education allowance” were found. We conducted the same tests for the dependent variable high health insurance premium, but without any significant results.

[12] We excluded the class “No school leaving certificate” because of the small sample size and the class “Others” because of the lack of interpretability.

[13] This was confirmed via pairwise Wilcoxon-Mann-Whitney-Tests. Only the test between the class “at least University-Entrance Diploma” and “Lower Secondary School Leaving Certificate” shows a significant result at a 5% level of confidence (p-value: 0.012).

5. Conclusion

The purpose of this article was to test whether labeling and earmarking are useful instruments in increasing the willingness to pay a contribution. The model of a net income maximizer served as a reference, under which individuals attempt to avoid all contributions that do not provide a concrete reward. In order to test this question empirically, we applied the instrument of conjoint analysis. We polled 542 gainfully employed individuals in Germany. The task of the study participants was to rank various combinations of contributions. From these rankings, we derived part worth utilities and the relative significance of the attributes of the individual contributions, which we could then compare with part worth utilities and the relative significance of a fictitious net income maximizer.

In the total sample, only one-fourth of the study participants actually chose the net income maximizing behavior described often by economic theory. The initial hypothesis that taxpayers always and exclusively strive to maximize their net pay and therefore, their consumption potential, must be rejected. The labeling of the contribution (as “income tax”, “health insurance premium”, or “education allowance”) and the description (earmarking) of the appropriation of the “education allowance” influence the willingness to pay this contribution. In order to distinguish the labeling effect and the earmarking effect from one another, study participants were divided into two subgroups, of which only one received additional information about the allocation of revenues from the education allowance. For the group that received no additional information regarding the allocation of funds, a statistically significant and economically relevant difference could be identified between the reference and the empirically proven sequencing behavior (labeling effect). It became clear that some study participants assigned a positive part worth utility to a high, but not concretely, earmarked education allowance although this is associated with a decrease in their net income. The labeling of a contribution therefore has an influence on its acceptance. A similar, yet weaker, effect in the same direction could be observed for the contribution “health insurance premium”. An appropriation of the contribution “education allowance” significantly strengthened this effect. On average, the study participants no longer described this contribution as a burden (negative net burden).

For tax effects research, these results indicate that models that predict the conformance of decisions on general fiscal conditions based on the net income maximizing hypothesis and which fail to take into account either the labeling or the appropriation of contributions, may

lead to inaccurate predictions. Whether our conclusions for working persons also apply to firms remains an open research question.

We suppose that the results found here are of great interest for future reforms to the tax and contribution systems. The labeling of a contribution and especially the definition of the use of the tax revenue generated led to an increase in the acceptance and willingness to pay among working individuals. An increase in acceptance likely also leads to diminished evasion and avoidance behavior and thus, to lower transaction costs and tax collection costs. Furthermore, our results approve that “labeling” and “earmarking” are important instruments for politicians in “selling” their tax or contribution policies.

There are numerous links between the current study and possibilities for further research. For instance, the question arises as to what extent the labeling and appropriation of individual types of contributions can also lead to negative perceptions and therefore, to a decrease in the willingness to contribute. When interpreting our results, it should be considered that this study dealt solely with a pure preference sequence, which had no economic consequences for the study participant. There is a need for further research which validates these results in connection with actual monetary incentives. As previously mentioned, the potential to transfer the results for contributions that are levied at a corporate level also remains to be tested. Another research question for further studies is to analyze our results in a multiple shot setting in order to test for taxpayers’ “learning effects”.

References

Alm J, McClelland GH, Schulze W (1992) Why do people pay taxes?. Journal of Public Economics 48: 21-38.

Alm J, Sanchez I, Juan A de (1995) Economic and noneconomic factors in tax compliance. KYKLOS 48: 3-18.

Andreoni J, Miller JH (2002) Giving according to GARP: An experimental test of the consistency of preferences for altruism. Econometrica 70 (2): 737-753.

Baldry JC (1986) Tax evasion is not a gamble. A report on two experiments. Economic Letters 22: 333-335.

Blaufus K, Ortlieb R (2009) Is simple better? A conjoint analysis of the effects of tax complexity on employee preferences concerning company pension plans. Schmalenbach Business Review 61 (1): 60-83.

Braak H van de (1983) Taxation and tax resistance. Journal of Economic Psychology 3: 95-111.

Buchanan JM (1963) The economics of earmarked taxes. The Journal of Political Economy 71 (5): 467-469.

Congdon WJ, Kling JR, Mullainathan S (2009) Behavioral economics and tax policy. National Tax Journal 62 (3): 375-386.

Cowell FA (1992) Tax evasion and inequity. Journal of Economic Psychology 13: 521-543.

Durand RM, Klemmack DL, Lee Roff L (1982) Citizen preferences for the allocation of federal tax dollars: A segmentation approach. Journal of Marketing & Public Policy 1: 169-180.

Feld LP, Tyran, JR (2002) Tax evasion and voting: An experimental analysis. KYKLOS. 55: 197-222.

Fortin B, Lacroix G, Villeval MC (2007) Tax evasion and social interactions. Journal of Public Economics 91: 2089-2112.

Fox CR, Lieb DS, Ratner RK (2005) How subjective grouping of options influences choice and allocation: Diversification bias and the phenomenon of partition dependence. Journal of Experimental Psychology 134 (4): 538-551.

Frey BS, Eichenberger R (1996) To harmonize or to compete? That's not the question. Journal of Public Economics 60: 335-349.

Goetz CJ (1968) Earmarked taxes and majority rule budgetary processes. The American Economic Review 58 (1): 128-136.

Green PE, Srinivasan V (1978) Conjoint analysis in consumer research - Issues and outlook. Journal of Consumer Research 5: 103-123.

Green PE, Tull DS, Albaum G (1988) Research for marketing decisions. 5th edn. Prentice-Hall, Englewood Cliffs.

Hair JF, Black WC, Barry JB, Anderson RE (2008) Multivariate data analysis, 7th edn. Pearson Education, New York.

Harbaugh WT, Mayr U, Burghart DR (2007) Neural responses to taxation and voluntary giving reveal motives for charitable donations. Science 316: 1622–1625.

Hardisty DJ, Johnson EJ, Weber EU (2010) A dirty word or a dirty world? Attribute framing, political affiliation, and query theory. Psychological Science 21 (1): 86-92.

Hundsdoerfer J, Sichtmann C (2009) The importance of taxes in entrepreneurial decisions: An analysis of practicing physicians' behavior. Review of Managerial Science 3: 19-40.

Kim CK, Evans JH, Moser DV (2005) Economic and equity effects on tax reporting decisions. Accounting, Organizations and Society 30: 609-625.

Kirchler E (2007) The economic psychology of tax behavior. Cambridge University Press, New York.

Kolm SC (1973) A note on optimum tax evasion. Journal of Public Economics 2: 265-270.

Lewis A (1979) An empirical assessment of tax mentality. Public Finance 34: 245-257.

Löfgren Å, Nordblom K (2009) Puzzling tax attitudes and labels. Applied Economics Letters 16: 1809-1812.

Luce RD, Tukey JW (1964) Simultaneous conjoint measurement: A new type of fundamental measurement. Journal of Mathematical Psychology 1: 1-27.

McCaffery EJ, Baron J (2006) Thinking about tax. Psychology, Public Policy, and Law 12 (1): 106-135.

McCleary W (1991) The earmarking of government revenue - A review of some world bank experience. World Bank Research Observer 6 (1): 81-104.

Milliron VC, Toy DR (1988) Tax compliance: An investigation of key features. Journal of the American Taxation Association 9: 84-104.

Schelling TC (1984) Choice and consequence. Harvard University Press, Cambridge.

Schmölders G (1959) Fiscal psychology: A new branch of public finance. National Tax Journal 12 (4): 340-345.

Spicer MW, Becker LA (1980) Fiscal inequity and tax evasion: An experimental approach. National Tax Journal 33 (2): 171–175.

Torgler B (2002) Speaking to theorists and searching for facts: Tax morale and tax compliance in experiments. Journal of Economic Surveys 16: 657-683.

Vogel J (1974) Taxation and public opinion in Sweden: An interpretation of recent survey data. National Tax Journal 27: 499-513.

Impressum:
Arbeitskreis Quantitative Steuerlehre, arqus, e.V.
Vorstand: Prof. Dr. Jochen Hundsdoerfer,
Prof. Dr. Dirk Kiesewetter, Prof. Dr. Ralf Maiterth
Sitz des Vereins: Berlin

Herausgeber: Kay Blaufus, Jochen Hundsdoerfer, Dirk Kiesewetter, Rolf J. König, Lutz Kruschwitz, Andreas Löffler, Ralf Maiterth, Heiko Müller, Rainer Niemann, Deborah Schanz, Sebastian Schanz, Caren Sureth, Corinna Treisch

Kontaktadresse:
Prof. Dr. Caren Sureth, Universität Paderborn, Fakultät für Wirtschaftswissenschaften,
Warburger Str. 100, 33098 Paderborn,
www.arqus.info, Email: info@arqus.info

ISSN 1861-8944