

Discussion Paper No. 08-123

**What Drives Giving in  
Extensive Welfare States?  
The Case of Germany**

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Centre for European  
Economic Research

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## Non-technical summary

Economic approaches explain charitable contributions by assuming that donors are interested in the provision of certain public goods by the respective charity. Indeed, many individuals donate money or time to non-profit-organizations. This is especially true for the US which are often perceived as having a highly developed culture of giving. Accordingly, a lot of empirical research on the phenomenon of private charitable contributions in the US exists. For countries with a strong tradition of an extensive welfare state and tax-financed provision of public goods by the public sector, far less is known. Due to the different institutional background it cannot be taken for granted that the results which have been derived for the US are valid for countries with larger welfare states.

To obtain some first empirical insights on the mechanisms underlying private charitable contributions in extensive welfare states, we estimate the reaction of donations to changes in income and price, i.e. the income and price elasticities of giving, in Germany. Due to the tax deductibility of private donations, the price of giving may be expressed as  $(1-m)$ , with  $m$  being the marginal income tax rate. We use a sample of 2,743 income tax returns from the German Taxpayer Panel which covers the years 2001 to 2003. The tax return data contains information on the amount of donations made by those individuals that decide to benefit from the tax deductibility of charitable contributions. Furthermore, the panel offers several socioeconomic variables, such as sex, age, religious affiliation, and marital status. In our estimations we take the selection process inherent in making charitable contributions explicitly into account because in about 65 % of the income tax returns no donations are declared.

Our estimates show a rather unelastic reaction of donations to changes in income: If income goes up by 1 %, donations increase on average by only 0.74 %. The reaction to price changes, however, is elastic: A 1 % decrease in price raises charitable contributions by 1.38 % to 1.54 %. This indicates that the income tax schedule has a significant impact on the decision to donate. For practical tax policy this means that the tax incentives for charitable contributions in the form of a tax deduction are effective. If compared to those studies for the US that apply the same estimation strategy, our results suggest no significant differences between elasticities in Germany and the US. Thus, income and tax incentives seem to affect giving in a comparable way in both countries, indicating that similar mechanisms underlying the act of giving are at work, even in countries with highly different welfare state traditions.

## Das Wichtigste in Kürze

Ökonomen erklären gemeinnützige Spenden mit einem Interesse der Spender an der Bereitstellung öffentlicher Güter durch die jeweils begünstigte Wohltätigkeitsorganisation. Tatsächlich ist zu beobachten, dass zahlreiche Individuen Geld oder Zeit an Non-Profit-Organisationen spenden. Dies gilt insbesondere für die USA, die vielfach als philanthropisches Vorbild gelten, weshalb das Phänomen der privaten Spendentätigkeit dort bereits hinreichend empirisch untersucht wurde. Für Länder mit einer Tradition als ausgeprägte Wohlfahrtsstaaten und einer steuerfinanzierten Bereitstellung öffentlicher Güter durch den Staat, existiert hingegen kaum empirische Evidenz. Aufgrund des grundlegend verschiedenen institutionellen Hintergrunds ist indes nicht klar, inwiefern die Resultate für die USA auf Länder mit einem umfangreichen Wohlfahrtsstaat übertragen werden können.

Um erste empirisch fundierte Erkenntnisse über die Mechanismen der Spendentätigkeit in Wohlfahrtsstaaten zu erhalten, ermitteln wir in diesem Arbeitspapier die Reaktion von gemeinnützigen Spenden auf Änderungen des Einkommens sowie des Preises, die so genannten Einkommens- und Preiselastizitäten, in Deutschland. Der Preis einer Spende kann aufgrund der Spendenabzugsfähigkeit im deutschen Einkommensteuerrecht als  $(1-m)$  definiert werden, wobei  $m$  der marginale Einkommensteuersatz ist. Zu diesem Zweck nutzen wir eine Stichprobe von 2743 Einkommensteuererklärungen aus dem deutschen Taxpayer Panel der Jahre 2001 bis 2003. Die Einkommensteuererklärungen enthalten Informationen über die Höhe der Spenden, die steuerlich geltend gemacht wurden, sowie über verschiedene sozioökonomische Variablen wie Geschlecht, Alter, Religionszugehörigkeit und Familienstand. Da in ca. 65 % aller Einkommensteuererklärungen keine Spenden angegeben sind, berücksichtigen wir in unseren Schätzungen explizit diesen Selektionsprozess.

Unsere Ergebnisse zeigen eine unterproportionale Reaktion von Spenden auf Einkommensänderungen: Ein Einkommensanstieg von 1 % führt zu einem durchschnittlichen Anstieg der Spenden von 0,74 %. Die Reaktion auf Preisänderungen ist hingegen recht elastisch: Ein Rückgang des Spendenpreises um 1 % erhöht die Spenden um 1,38 % bis 1,54 %. Dies zeigt, dass der Einkommensteuertarif einen deutlichen Einfluss auf die Spendenentscheidung hat. Vergleichen wir die Ergebnisse mit jenen Studien für die USA, die eine ähnliche Methode genutzt haben, sind keine signifikanten Unterschiede in den Einkommens- und Preiselastizitäten in Deutschland und den USA festzustellen. Die der Spendenentscheidung zugrunde liegenden Mechanismen scheinen somit in beiden Ländern ähnlich zu sein, auch wenn die wohlfahrtsstaatlichen Traditionen höchst verschieden sind.

# What Drives Giving in Extensive Welfare States? The Case of Germany

Sarah Borgloh (Centre for European Economic Research) ♦

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## Abstract

Considerable empirical research exists on donations in the US and their determinants, including estimations of the income and price elasticity of giving. By contrast, less is known about the determinants of countries with an extensive welfare state. We address this deficiency by studying the drivers of charitable giving in Germany, a country with a highly developed welfare state, using tax return data of the years 2001 to 2003. Our study not only expands the literature by adding another country. Moreover, it uses modern econometric methods which account for the selection process inherent in charitable contributions. Our results suggest no significant differences between donors in the US and Germany with respect to income and price elasticities indicating that the mechanisms underlying the act of giving are similar for countries with highly different welfare state traditions.

**Keywords:** private donations, income elasticity, price elasticity, welfare state

**JEL:** H24, H41

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## 1. Introduction

Economic approaches to explain voluntary giving are usually based on the assumption that donors have an interest in the provision of public goods financed by the benefited charities.<sup>1</sup> This perspective is particularly well motivated for countries like the US with a strong tradition of donor financed private provision of social services, education and the like. For countries with a larger public sector and an extensive welfare state this assumption may be less appealing given that the government provides a much wider range of public goods financed through coercive taxation. Hence, the strong preoccupation of the empirical literature with US data and the scarcity of studies for countries with large welfare states is a significant shortcoming. It cannot be taken for granted that this literature's results e.g. on income and price elasticities of voluntary giving for the US can be generalized to countries with larger welfare states.

We address this gap in the literature by studying the drivers of giving in Germany, a country with a strong welfare state tradition. The novelty of our approach, however, goes beyond adding another country. To our knowledge we are not only the first to estimate price and income elasticities of private donations for a country with a strong welfare state tradition by using panel data. We proceed upon the work by Paqué (1982) by using modern econometric methods which account for the large number of non-donors and the selection process in the contribution decision. Employing this panel's currently available waves for the years 2001 to 2003 we apply a Tobit estimation technique as well as a two step Heckman estimation procedure to identify among other determinants income and price elasticities of giving. Comparing our results with the literature on the US we do not find significantly different elasticities. This indicates that a generous welfare state does not change the mechanisms underlying the act of giving substantially.

Our article is organized as follows: First, we offer a literature survey in Section 2, followed by a neat description of the institutional setting in Germany in Section 3. Subsequently, the fourth and fifth sections describe the data set and explicate the estimation method. At the end, we present the results of our estimation in section 6 and conclude with an outlook.

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<sup>1</sup> The classic model of the private provision of public goods with altruistic individuals was substantially shaped by Warr (1982, 1983) and Bergstrom et al. (1986). Andreoni (1990) added the notion of "warm glow". Crumpler and Grossman (2008) show in an experiment that warm glow plays a substantial role in the decision to donate.

## 2. Literature survey

Many empirical studies on charitable giving exist, which try to measure the influence of income and price on giving by determining the corresponding elasticities. A lot of studies have been conducted for the United States, but we may consider only a choice of them here (Table 2).<sup>2</sup> The bulk of surveys is to be divided by the kind of data that is used. In a first step, we have to distinguish studies that use cross-sectional data from those that use time series of cross sections or panel data. Furthermore, some authors recur to tax return data, while others employ survey data.

The first surveys typically used *cross-sectional data* either from household surveys or individual tax returns whereas the more recent studies mainly work with *panel data* from income tax returns. Due to the application of various econometric methods and different data sets, the results for the United States vary widely. For cross-sectional data, income elasticities range from 0.02 to 3.10 and price elasticities cover values between -4.97 and 0.02. On average, however, the results from panel studies deliver smaller values with income elasticities between 0.09 and 1.30 and price elasticities ranging from -2.98 to 0.41, indicating a lower reactivity of donations to changes in the tax price and to changes in income. Pelozo and Steel (2005) use this rich data set to conduct a meta-analysis for the price elasticities of charitable contributions. Their results show that the use of tax-return data provides significantly lower price elasticities than survey data do. Moreover, they find a weighted mean of -1.44 and conclude that the tax deductibility of private donations in the United States is treasury efficient.<sup>3</sup>

A few studies for countries other than the US have been conducted, such as Canada, Russia and Singapore. Again, the results are not very clear and cover a wide range of values showing very elastic as well as very inelastic reactions of charitable contributions to changes in price and income. We contribute to the literature in that we estimate income and price elasticities of private donations for Germany, a country with a strong welfare state tradition, to see whether the mechanism at work differs from the one in the United States. So far, Paqué (1982) has been the only one to conduct such estimations for Germany. We proceed upon his work using

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<sup>2</sup>We have chosen those studies from the meta-analysis by Pelozo and Steel (2005) which have been cited by other papers most often, or which employ similar methods as we do. Clotfelter (1985) and Steinberg (1990) both offer extensive overviews of estimated price and income elasticities of giving.

<sup>3</sup>Many studies declare the tax deduction of donations to be treasury efficient if the absolute value of the price elasticity is larger than 1. In this case the loss in tax revenue of the state is supposed to be smaller than the increase in donations. We refrain from such an interpretation because to us a statement on tax efficiency seems only meaningful if the baseline amount of donations is considered.

modern econometric methods, which account for the selection process inherent in making charitable contributions, and using panel data instead of time series of cross sections.

**Table 2: Selection of studies**

Study	Country	Price Elasticity	Income Elasticity	Panel/Cross-Sectional Data	Tax File/Survey Data
Abrams, Schitz (1978)	US	-1.13/-1.00	0.80/0.85	Cross-Section	Tax File
Abrams, Schitz (1984)	US	-1.44	0.54	Cross-Section	Tax File
<i>Auten, Joulfaian (1996)</i>	<i>US</i>	<i>-1.31</i>	<i>0.78</i>	<i>Cross-Section</i>	<i>Tax File</i>
Auten, Sieg, Clotfelter (2002)	US	-2.13/-0.02	0.29/0.91	Panel	Tax File
<i>Brown, Lankford (1992)</i>	<i>US</i>	<i>-1.89</i>	<i>0.36</i>	<i>Cross-Section</i>	<i>Survey</i>
Clotfelter (1980)	US	-1.40/-0.24	0.46/0.61	Panel	Tax File
Clotfelter, Steuerle (1981)	US	-1.27	0.78	Cross-Section	Tax File
<i>Duquette (1999)</i>	<i>US</i>	<i>-1.05</i>	<i>0.93</i>	<i>Cross-Section</i>	<i>Tax File</i>
Feldstein (1975)	US	-1.46	0.81	Cross-Section	Tax File
Feldstein, Taylor (1976)	US	-1.42/-1.09	0.70/0.80	Cross-Section	Tax File
Kingma (1989)	US	-0.43	0.99	Cross-Section	Survey
<i>O'Neil et al. (1996)</i>	<i>US</i>	<i>-1.00</i>	<i>0.44</i>	<i>Cross-Section</i>	<i>Tax File</i>
Randolph (1995)	US	-1.55/-0.51	0.58/1.14	Panel	Tax File
<i>Reece (1979)</i>	<i>US</i>	<i>-1.40</i>	<i>0.55</i>	<i>Cross-Section</i>	<i>Survey</i>
Reece,Zieschang (1985)	US	-0.36/-0.01	0.02/0.35	Cross-Section	Tax File
<i>Schiff (1985)</i>	<i>US</i>	<i>-2.79</i>	<i>0.76</i>	<i>Cross-Section</i>	<i>Survey</i>
Schwartz (1970)	US	-1.23/-0.24	0.14/1.14	Cross-Section	Tax File
<i>Tiehen (2001)</i>	<i>US</i>	<i>-1.14</i>	<i>0.30</i>	<i>Cross-Section</i>	<i>Survey</i>
<i>Brooks (2002)</i>	<i>Russia</i>	<i>-6.68</i>	<i>2.78</i>	<i>Cross-Section</i>	<i>Survey</i>
Chua (1999)	Singapore	-6.15/-1.00	0.24/0.74	Cross-Section	Tax File
Glenday, Gupta, Pawlak (1986)	Canada	-0.15	0.62	Panel	Survey
Hood (1977)	Canada	-0.86	0.52	Panel	Tax File
Paqué (1982)	Germany	-1.62	1.25	Cross-Section	Tax File

### 3. The institutional setting in Germany

Before examining the effects of the tax deduction for charitable contributions in Germany, we necessarily have to take a look at the German institutional setting. We focus on the German Income Tax Law (ITL) in general and its specificities with regard to the tax treatment of private donations. As our data set covers the years 2001 to 2003 we display the tax regulations that were valid at this time and do not enlarge upon the current situation.

#### 3.1 The German Income Tax Law (ITL)

In Germany, incomes of individuals are taxed according to the ITL. The simplified scheme for the calculation of the tax to be paid is as follows:

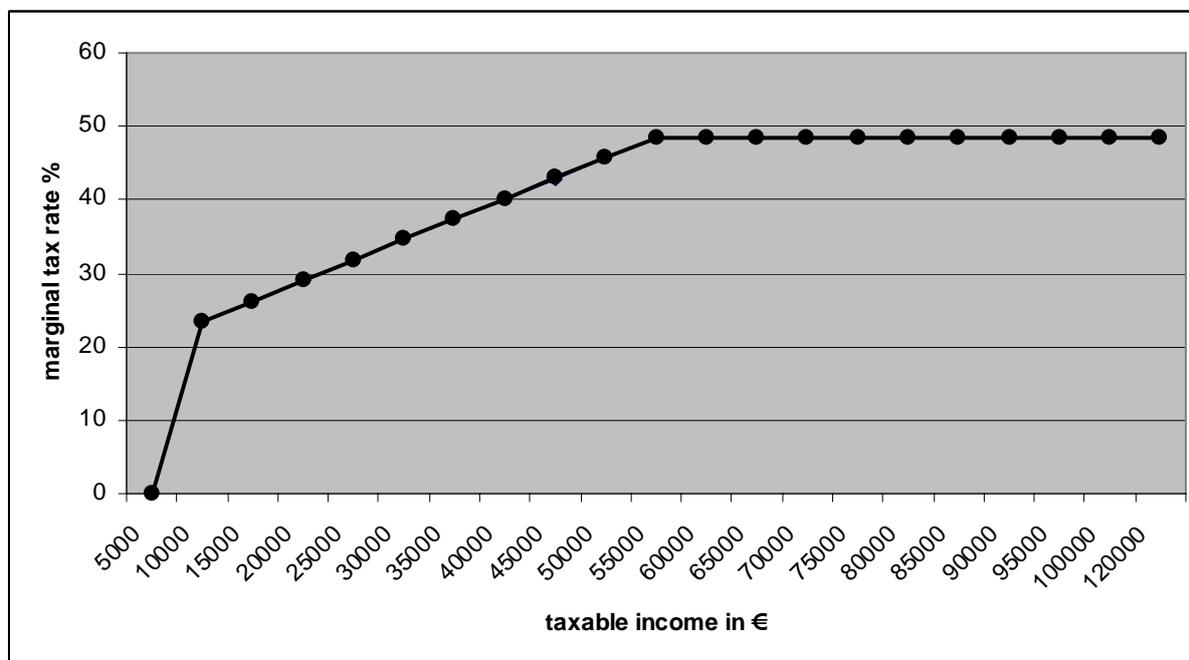
$$\begin{array}{r}
 \text{Income from seven different categories of income}^4 \\
 \hline
 = \text{Total income} \\
 - \text{Reliefs for the elderly and farmers} \\
 \hline
 = \text{Gross amount of income} \\
 - \text{Loss deduction} \\
 - \text{Special expenses (including charitable giving)} \\
 - \text{Extraordinary expenses} \\
 \hline
 = \text{Income} \\
 - \text{Personal allowances} \\
 \hline
 = \text{Taxable income}
 \end{array}$$

The tax rate that is applied to the taxable income is derived from the income tax scale. After the application of the tax rate and the subtraction of various tax abatements one obtains the income tax to be paid.

The German income tax scale is progressive, which means that the average tax rate strictly increases with income. The tax scale for the years 2001 to 2003 is basically the same with only very slight variations in the size of income that is freed of income tax payments. The illustration of the marginal tax rates (figure 1) shows that the German income tax scale consists of three “zones”. In 2001 taxable incomes of up to 7,206 Euros per year were tax-exempted, whereas in 2002 and 2003 this amount increased to 7,235 Euros per year. The second zone, called *progressive zone*, ranges from taxable incomes of 7,206/7,236 Euros

(2001/2002 and 2003) to taxable incomes of 54,998/55,007 Euros per year. All taxable income above 54,998/55,007 Euros per year falls into the *proportional zone* where the marginal tax rate is 48.5%.

**Figure 1: Marginal income tax rates in Germany 2002 and 2003**



This scale of marginal tax rates leads to the following picture of rising average tax rates (figure 2), implying a highly progressive income tax scale.

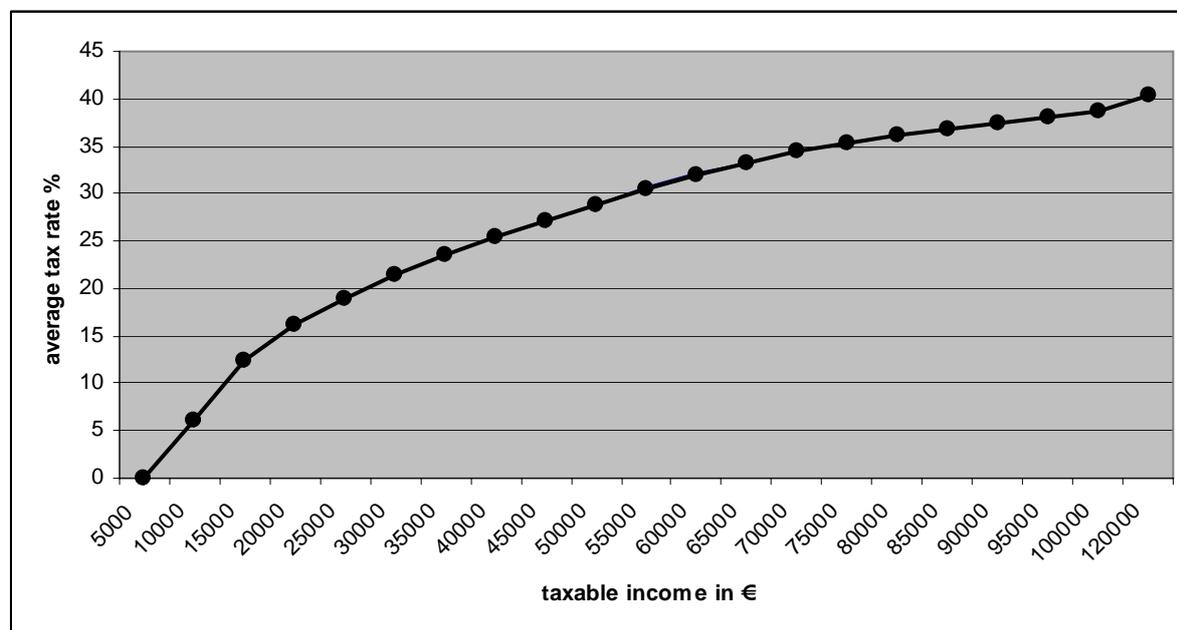
To promote married couples and families, the ITL provides the possibility of joint assessment, meaning that husband and wife each pay income tax on half the total of their combined incomes. The savings in tax payments are greater the more diverse the incomes of husband and wife are.

Furthermore, the German ITL contains two regulations which increase effective marginal tax rates. First, the ITL provides the payment of a solidarity surcharge as high as 5.5% of income tax payments. The main reason for the introduction of this extra charge in 1991 was the cost of the German reunification. All revenues that stem from the solidarity surcharge go to the Federal Government and are not earmarked. Second, in Germany for some religious communities that are recognized as public corporations the state collects the so-called *church tax* from the communities' members. The tax amounts to 8% or 9% of individual income tax payments respectively, depending on the federal state an individual lives in. For members of

<sup>4</sup> This includes income from agriculture and forestry, income from business, income from independent work, income from dependent work, capital income, income from rent and lease, and other income.

these religious communities, among those the Catholic and Protestant churches, the payment of the tax is obligatory and the only possibility to avoid it is to leave the community officially.

**Figure 2: Average income tax rates in Germany 2002 and 2003**



### 3.2 The tax treatment of charitable contributions in Germany

In Germany, private donations to charities fall into the category of *expenses for tax-privileged purposes* after §10b Income Tax Law (ITL).<sup>5</sup> As is the case in many other countries, these expenses are tax-deductible and include both private donations and membership-fees. When assessing the income tax, these expenditures – as well as further special expenses – may be deducted from the gross amount of income, which results in a reduction of taxable income. The application of the tax rate to taxable income yields the income tax to be paid. Thus, the deduction of private donations reduces the gross amount of income and therefore taxable income and lowers the tax bill.

Until 2006, donations were tax-deductible if they were given to benevolent, parochial, religious, scientific or especially eligible charitable purposes up to an amount of five percent of gross income. For donations to benevolent, scientific and especially eligible cultural purposes the upper limit of deductibility increased by additional five percentage points to even ten percent of gross income.<sup>6</sup> The classification of purposes that was *especially eligible* could be found in the executive order to the ITL. The same rules applied to the tax-

<sup>5</sup> The prerequisite is that the donee organization is recognized as charitable as defined below.

<sup>6</sup> In 2007, a new bill that is to promote civil society passed both German chambers. It is supposed to enhance private giving by raising the upper limit for tax deductible donations to 20 percent of income.

deductibility of membership-fees with the restriction that fees paid to sport clubs, some cultural clubs, local history clubs and some others<sup>7</sup> could not be considered. Moreover, donations and fees were deductible only if the donee was either a domestic public corporation or an institution that serves benevolent, parochial or charitable purposes. Besides, the German ITL provided the opportunity to deduct donations to foundations up to a sum of 20,450 Euros from income when assessing the income tax. These foundations had to be either public bodies or had to be recognized as exclusively and directly serving charitable, benevolent or parochial scopes.

To sharpen the understanding of which private donations and membership-fees are tax-deductible, we are going to define some of the notions of the ITL as they can be found in the German Fiscal Code (*Abgabenordnung*): A corporate body pursues *benevolent* aims if its activities are exclusively and directly geared to helping others in a selfless manner. In this case, the assisted persons have to be in need of help due to physical, mental or psychic handicaps or an outstanding social need has to be concerned. *Parochial* scopes are traced if the corporate body's activities are exclusively and directly aimed at promoting a religious community that is itself a public body. The promotion of *religious* or *scientific* scopes falls under the category of a corporate body pursuing *charitable* purposes. Both cases are not precisely specified. The Fiscal Code lists more than 20 purposes that are approved as *charitable*.

Furthermore, §10b of the German ITL allowed the deduction of donations to political parties up to 1650 Euros or 3300 Euros respectively in case of joint assessment. This deduction could only be exercised if those donations had not already been asserted as tax abatements after §34g ITL.

We are going to limit our study to the donations and fees described above, which we are going to subsume under the term “donations” for convenience. Thus, we exclude the major part of donations and fees paid to political parties: As there are special regulations (§34g ITL) applying to those, their consideration would unnecessarily complicate our analysis.<sup>8</sup>

#### 4. The Data

For our study we use a sample of the German Taxpayer Panel. The Taxpayer Panel that is derived from the yearly German Income Tax Statistics by the Federal Statistical Office (FSO)

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<sup>7</sup> These restrictions are defined in §52 II No. 4 Fiscal Code.

<sup>8</sup> Besides, there is no general agreement whether donations to organizations which principally aim at assisting their candidates to secure their political function should be recognized as charitable.

currently covers three years from 2001 to 2003 and contains observations on averaged 25 million taxpayers every year. To construct a panel data set, the FSO linked up, where possible, the observations of the single years according to the individual's tax identification number or individual identifiers.<sup>9</sup> The persons that could not be linked up are typically young professionals or retirees, which implies that the average income of the panel is higher than that of the cross-sections. The sample which has been provided to us contains observations on 1,005 income tax returns for each of the three years.

The data set does not only cover various income and tax variables, but it contains also information on some socioeconomic characteristics of the taxpayers. Since variables like sex, age, religious affiliation and the federal state of residence are likely to influence giving behaviour, they should be included in an econometric analysis. Furthermore, the data set provides information on the type of tax assessment, i.e. separate assessment and joint assessment, respectively. It is important to point out that in our study the unit of observation is not the single taxpayer, but rather the single tax return. If married couples choose the option of joint assessment, they get the identical tax identification number and are therefore considered as one observation. Moreover, the data set provides information on income, the various sources of income and the amount of donations.<sup>10</sup>

To conduct correct estimations, we have to effect some manipulations with the data set. As we are calculating income and price *elasticities*, we take the logarithm of the corresponding variables. We drop all individuals that reported a non-positive gross amount of income in one or more of the three years. After pooling the data and correcting for non-positive incomes, there remain 2,743 observations.

We are not able to distinguish which share of a donation is a membership-fee and which share is a charitable contribution. There may be different motives underlying the various types of donations, but we are not able to estimate their relevance properly. Besides, it should be kept in mind that only those persons that filed an income tax return are included in this data set. So, we have no information about donations by people who do not generate revenues from any of the seven categories of income as defined before.

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<sup>9</sup> These identifiers include among others place of residence, religious affiliation, sex, and existence of different types of income.

<sup>10</sup> The data set does not provide any information on the purpose that the donations go to, so we are not able to distinguish, for example, donations to environmental organizations from those to museums.

## 5. The Model

In the following we conduct a double estimation strategy. We apply, first, a Tobit estimation and, second, a two-step-Heckman procedure.

Our data show that private donations represent a corner solution outcome. In about 65 % of the income tax returns no donations are declared. As OLS is generally inconsistent in this case, it is more sensible to use a Tobit model, which expresses the donations observed in terms of an underlying latent variable. We estimate a standard Tobit model after Tobin (1958) which may be expressed as

$$y_i^* = x_i\beta + u_i$$

$$y_i = \max(0, y_i^*)$$

assuming a homoskedastic normal distribution, i.e.  $u_i|x_i \sim Normal(0, \sigma^2)$ . Thus, the donation we observe in our data set equals  $y_i^*$  if  $y_i^* > 0$  and zero otherwise. We do not pay much attention to the value of  $y_i^*$  because our variable of interest is  $y_i$ , the observed charitable contribution.

As the estimated coefficients of any Tobit model are not meaningful, we calculate the marginal effect on the unconditional mean of the dependent variable, that is  $E(y|x)$ .

A very strong assumption the Tobit model makes is that the decision whether to donate at all and how much to donate follow the same mechanism. It may well be, however, that some of the explanatory variables influence these two decisions differently. To allow for this possibility, we also estimate a sample selection model after Heckman's two-step method (1979). Hence, we look at two stages of the donor's decision: At the first stage, he decides whether to make a charitable contribution at all, so a probit model of the form  $G_i = \gamma Z_i + v_i$  is estimated, where  $G_i = 1$  if we observe a positive donation. At the second stage, the individual decides how much to donate and an OLS regression on the selected sample is estimated.

We employ the same regressors in the Tobit model and in the two-step model, except for the dummy variable for joint assessment which is excluded in the second stage regression of the

Heckman model.<sup>11</sup> This variable seems to have a stronger influence on the decision whether to make a charitable contribution at all than on the amount of the contribution.

Our specification for both the Tobit and the sample selection model is as follows:

$$\ln G_{it} = \mu + \beta_1 \ln Y_{it} + \beta_2 \ln P_{it} + \beta_3 T_t + \beta_4 X_{it} + u_{it}$$

where  $i = 1, \dots, N$ ,  $t = 1, \dots, T$ .

The act of giving is likely to be influenced by unobserved characteristics, such as the attitude towards private initiatives providing public goods and the approach to helping and supporting others. Due to procedural constraints<sup>12</sup> in the analysis of the Taxpayer Panel advanced panel techniques are currently unavailable to cope with these problems. We address these, however, by controlling for the donor's age, a dummy for individuals resident in the Eastern federal states, and the donor's religious affiliation. These regressors are likely to influence an individual's attitude towards charitable giving and are thus assumed to control for the unobserved attitudinal effects.<sup>13</sup>

More precisely, the variables of our specification are defined as follows:

*Giving* ( $G$ ) is the amount of donations after §10b ITL that has been explicated before. As we calculate elasticities we take the logarithm of the donations' value. In about 65 percent of all tax returns no donations are declared. As the logarithm of the number zero is not defined, in these cases we replace zero donations by donations of 1 €. This manipulation yields a logarithm of  $G$  equal to zero. *Income* ( $Y$ ) is the gross amount of income (see section 3 for its definition). It has been shown that elasticity estimates associated with charitable contributions are quite insensitive to the choice of the income measure. Nevertheless, the gross amount of income seems the proper choice as compared to taxable income because it is strictly exogenous with regard to the regressand. Moreover, it is the appropriate measure of

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<sup>11</sup> When we included this explanatory variable in the second stage, the coefficient was insignificant.

<sup>12</sup> Due to data protection rules, all estimations with the Taxpayer Panel have to be conducted by the German Statistical Office itself on the basis of SAS programmes developed by the researchers. The possibilities to apply advanced panel techniques for this data set under the SAS constraint are limited which left regressions based on pooled data the only methodological choice currently applicable.

<sup>13</sup> The estimates may be inconsistent if there is still some unobserved heterogeneity left. According to Wooldridge (2002) this is the case if the unobserved variable is correlated with the explanatory variables.

disposable income as we assume that asserting the tax deductibility of special expenses is the outcome of a taxpayer's personal consumption choice.<sup>14</sup>

The tax-determined *price* ( $P$ ) of giving is customarily defined as  $(1-m)$ , with  $m$  being the marginal tax rate that the taxpayer faces. This is quite straightforward due to the tax deductibility of donations. Defined in this way,  $P$  measures the taxpayer's opportunity cost of giving in terms of foregone personal consumption. If we take into account the progressivity of the German income tax system, this implies that earners of high incomes face a considerably lower price of giving than earners of low incomes do. To ensure the exogeneity of  $P$ , we use the so-called "first-dollar price of giving". This means that we define  $m$  as the marginal rate relevant if no donations were made. If we calculated  $m$  as the marginal tax rate applicable after donations are deducted from income, we would introduce spurious correlation between  $G$  and  $P$ .<sup>15</sup> To obtain the marginal tax rate we apply the tax scales of the years 2001 to 2003 to taxable income. First, we calculate the income tax to be paid providing for the deduction of donations. In a second step, we compute the tax liability under the no-contribution assumption and apply the tax rate to the measure *taxable income plus donations*.<sup>16</sup> The first-dollar marginal tax rates are obtained by dividing the difference between the tax liabilities by the sum of donations.

$T$  is a *time dummy variable* that is to account for up- and downturns in giving during the observed time period. Giving in Germany may have been exceptionally high in the years 2002 and 2003 due to the flood along the river Elbe and the resulting public awareness for this catastrophe. Moreover, the Euro has been introduced as a means of payment in 2002 and according to the so-called "Euro Effect" it might be that people gave more in 2002 due to metric effects.<sup>17</sup> Hence, we include time dummies for the years 2002 and 2003, which should have a positive coefficient compared to the baseline year 2001.

Furthermore, we include several *socioeconomic variables* ( $X$ ) in our specification. The Taxpayer Panel provides information on sex, age, religious affiliation, type of assessment, and federal state of residence.

Due to the possibility of joint assessment, the variable *sex* has no clear gender interpretation in this context. The value of the variable complies with the sex of the individual that generates the principal income, which, in most cases, is the husband. If we used the variable *sex*, we

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<sup>14</sup> As mentioned before, we have to exclude all observations in which non-positive incomes are declared.

<sup>15</sup> A higher amount of donations would reduce taxable income and thereby raise the price of giving. Thus, the price elasticity would be biased towards zero.

<sup>16</sup> We add the contributions after §10b ITL to taxable income and apply the tax scale. For non-donors we follow the procedure of Barrett (1991) and assume a 100 € contribution that is added to taxable income.

would observe only those females that are not married. It is likely that these women dispose of less income than their married counterparts, which, in turn, would lead to estimates of donations that are biased downward. Therefore, we get back to the variable of *single or joint assessment*, use a dummy for joint assessment and drop the sex variable.

It is likely that the *religious affiliation* has a certain influence on giving behaviour. People that are affiliated to a certain denomination, first of all, may rather give donations to charities that pursue religious or parochial aims while people that do not belong to any denomination may rather give to scientific or secular purposes in general. In the context of this study, we are not able to account for such differences because we cannot distinguish the purposes people make their donations for. Nevertheless, it seems important to include *religious affiliation* in our estimations to see whether this variable has any influence on the sum that is donated. We may distinguish between Catholics, Protestants, and people belonging to other confessions or having no confession. We include dummies for individuals being Catholic and Protestant. One has to bear in mind, though, that we cannot deliver a complete picture of the influence of *religious affiliation* on giving. It may be that taxpayers belonging to a certain denomination regard the church taxes they pay as a substitute for donations to other charities.<sup>18</sup>

It is very likely that *age* plays an important role as a determinant of charitable donations. Several studies have shown that the amount of donations increases with age, it may be that considerations about how to avoid the inheritance tax are involved. In a first version of the model we assume a linear relationship between the years of age and private donations. To control for an “inheritance tax effect”, we include a dummy variable for individuals over 65 years of age in a second version of the model.

## 6. Results

For the 2,743 observations in this data set we calculated the descriptive statistics as shown in table 1.

As can be seen, our sample covers a wide range of donations and incomes. There is a large number of income tax returns in which zero donations are declared, with the highest amount of donations in a single income tax return of 157,025 Euros. The yearly gross amount of

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<sup>17</sup> An individual, for example, that donated 50 Marks in 2001, might have donated 50 Euros in 2002 for reasons of custom.

<sup>18</sup> Furthermore, it seems plausible that people who regularly attend church give “nonofficially” during the collection. These donations do not appear in the Income Tax Statistics and cannot be deducted.

income varies widely, too, ranging from 69 Euros to 1,470,968 Euros, taking into account only those returns that report a positive income. The price of giving ranges from 0.515 Euros for a donation of 1 Euro for those in the highest income bracket, where the marginal tax rate of 48.5 % applies, to 1 Euro for those who do not pay income tax. Furthermore, we observe individuals – who declare the principal income in the tax return – from 22 to 88 years of age.

**Table 1: Descriptive statistics**

Variable	Mean	Std. Dev.	Minimum	Maximum
Donations	470.48	4835.42	0	157,025
Income	45524.35	71933.12	69.02	1,470,968
Price	0.75	0.14	0.515	1
Year 2002	0.33	0.47	0	1
Year 2003	0.33	0.47	0	1
Joint Assessment	0.48	0.50	0	1
Catholic	0.29	0.45	0	1
Protestant	0.28	0.45	0	1
Age	45.53	9.01	22	88
Age Dummy	0.07	0.26	0	1

Our estimation results partly support our expectations. Table 2 displays conditional marginal effects of the Tobit regression. Here, we display the marginal effects on the unconditional mean. We observe a highly unelastic reaction of donations to income. If income goes up by 1%, donations increase by only 0.74%. The reaction to a change in price, however, is elastic. A 1% decrease in price raises charitable contributions by 1.38% to 1.54%, depending on the specification. Both income and price elasticities are highly significant on a 1% level. In the model which assumes a linear relation between donations and age the price elasticity is significant on a 5% level. Married couples that choose the option of joint assessment donate significantly more than single households do, and Catholics and Protestants contribute more than people belonging to none of the confessions. The effect is stronger, however, for Catholics. No matter, whether we include age as a dummy variable or assume a linear relation, older people donate significantly higher amounts of money, confirming our expectations. The only variables that are not significant are the time dummy variables. We cannot find a significant influence of the year during which the donations have been made on the amount of the charitable contributions, and, moreover, we did not expect the negative coefficient for giving in 2002 and 2003.

**Table 2: Estimation results Tobit**

Variable	(1)	(2)
In Income	0.744*** (0.113)	0.735*** (0.113)
In Price	-1.536*** (0.541)	-1.375** (0.537)
Year 2002	-0.077 (0.111)	-0.090 (0.111)
Year 2003	-0.067 (0.111)	-0.097 (0.111)
Joint Assessment	0.337*** (0.118)	0.284** (0.117)
Catholic	0.852*** (0.131)	0.871*** (0.131)
Protestant	0.701*** (0.131)	0.701*** (0.131)
Age Dummy	1.026*** (0.235)	
Age		0.029*** (0.005)

Table shows coefficients and standard errors in parentheses for the Tobit model. Here, marginal effects on the expected value of the logarithm of donations are displayed. Regression shown by column (1) contains a dummy variable for age, regression in column (2) assumes a linear relation between age and the logarithm of donations.

\* 10% significance level.

\*\* 5% significance level.

\*\*\*1% significance level.

If we take a look at the results from the two-step model, we see immediately that there seem to be different mechanisms at work for the decisions whether to donate and how much to donate. In the selection equation, we observe both inelastic reactions to changes in income and price, both significant on a 1% -level. Again, most of the other variables have a positive influence on the decision to make a charitable contribution. In the outcome equation, the price variable turns out to be insignificant and is much smaller than in the Tobit model. At the same time, there seems to be a highly elastic reaction to changes in income, which we did not observe in the Tobit model. Again, the time dummy variables have an unexpected negative sign and are insignificant in the selection equation. In the outcome equation, however the time dummy variables have a significant negative impact. We rather expected the results to be vice versa because the flood should have induced more people to make a donation, whereas the average amount of money donated in those years remained stable.

**Table 3: Estimation results Heckman**

Variable	(1)	(2)
<b>Selection equation</b>		
In Income	0.426*** (0.059)	0.410*** (0.059)
In Price	-0.841*** (0.286)	-0.806*** (0.284)
Year 2002	-0.019 (0.063)	-0.029 (0.063)
Year 2003	-0.000 (0.063)	-0.021 (0.063)
Joint Assessment	0.185*** (0.050)	0.173** (0.050)
Catholic	0.446*** (0.062)	0.456*** (0.062)
Protestant	0.380*** (0.063)	0.382*** (0.063)
Age Dummy	0.456*** (0.097)	
Age		0.017*** (0.003)
<b>Outcome equation</b>		
In Income	1.192*** (0.107)	1.168*** (0.108)
In Price	-0.165 (0.545)	-0.060 (0.550)
Year 2002	-0.376*** (0.134)	-0.375*** (0.135)
Year 2003	-0.543*** (0.133)	-0.552*** (0.135)
Catholic	0.530*** (0.135)	0.564*** (0.137)
Protestant	0.227 (0.139)	0.226 (0.140)
Age Dummy	1.279*** (0.193)	
Age		0.033*** (0.006)

Table shows coefficients and standard errors in parentheses for the Heckman model.

\* 10% significance level.

\*\* 5% significance level.

\*\*\*1% significance level.

If we compare our results to studies for the US, we have to take into account that the two models we estimated here, deliver different results. Taking the standard deviations into account, the Tobit model allows for income elasticities between 0.622 and 0.857, and for price elasticities between -0.838 and -2.077. The income and price elasticities are quite similar to the results of the US studies which have used the Tobit method and which are printed in italic letters in Table 2. This is a hint that there may be the same mechanism at work in Germany and the US and confirms the picture of low income elasticities and moderate price elasticities.

If we take into account the results from the two-step estimation, however, the picture turns out to be very different. Here, we observe a very high income elasticity in the outcome equation and an unelastic reaction to changes in price. As there are no studies to compare the results with, we cannot say anything about similarities in giving behaviour in Germany and the US in this case.

Compared to the estimation results of Paqué (1982), who employed different estimation methods, our estimations tend to result in both lower price and income elasticities. This confirms the finding for the US that the use of longitudinal data delivers smaller coefficients.

## **7. Conclusion**

Our article contributes to understand whether the mechanisms of giving in a highly developed welfare state like Germany differ from those in the United States. Due to the different extent of tax financed public goods it cannot be taken for granted that the insights from the extensive US literature on income and price elasticities of giving can be generalized to countries with large welfare states. In Germany, charitable contributions do not seem to be very responsive to changes in income, but rather to changes in price, indicating that the income tax schedule plays an important role for the decision to donate. However, if one takes the standard deviations into account, the estimated elasticities for Germany do not differ significantly from those estimated for the United States. Thus, no principal difference in the motivations of donors from Anglo-Saxon countries and countries with a strong welfare state tradition can be substantiated on the basis of our methodology.

This result is relevant for practical tax policy: In many countries with a strong welfare state tradition governments increasingly try to foster private giving and voluntary provision of public goods in order to cope with increasing fiscal stress resulting from tax competition and demographic change. In particular, governments try to promote private donations by

subsidizing charitable contributions in the form of tax incentives, most often as a deduction. Our results on the price elasticity of giving confirm that these tax incentives should not be less effective in countries like Germany compared to countries with a long tradition of voluntarily financed public goods.

There are, however, some limits of our study which must be left to further research. First, the time period covered by our panel includes no statutory tax change and provides therefore only limited variation in the data. To remedy this, the model is to be reestimated as soon as the data for 2004 is available. Second, so far the access and programming restrictions mentioned do not yet allow to exploit fully the advantages of the panel data set by the use of more advanced panel estimation techniques. Third, we have to stress that we cannot distinguish the various purposes donations go to, for example environmental groups, cultural activities, and social services. Therefore we assume that all types of donations react in an identical manner to changes in income and price. Fourth, by using tax return data we eliminate those individuals with very low incomes and may not come to any conclusions regarding their giving behaviour.

Nevertheless, our results strongly indicate that income and tax incentives affect giving in a comparable way in the US and in Germany.

## References

- Abrams, B. and M. Schitz (1978), *The 'Crowding-Out' Effect of Governmental Transfers on Private Charitable Contributions*, Public Choice 33: 29-39.
- Abrams, B. and M. Schitz (1984), *The Crowding Out Effect of Governmental Transfers on Private Charitable Contributions: Cross Section Evidence*, National Tax Journal 37: 563-568.
- Andreoni, J. (1990), *Impure Altruism and Donations to Public Goods: a Theory of Warm-Glow Giving*, The Economic Journal 100: 464-477.
- Auten, G. and D. Joulfaian (1996), *Charitable Contributions and Intergenerational Transfers*, Journal of Public Economics 59: 55-68.
- Auten, G., H. Sieg and C. Clotfelter (2002), *Charitable Giving, Income and Taxes: An Analysis of Panel Data*, American Economic Review 92: 371-382.
- Barrett, K. (1991), *Panel-Data Estimates of Charitable Giving: A Synthesis of Techniques*, National Tax Journal 44: 365-381.
- Bergstrom, L., T. Blume and H. Varian (1986), *On the Private Provision of Public Goods*, Journal of Public Economics 29: 25-49.
- Brooks, A. (2002), *Charitable Giving in Transition Economies: Evidence from Russia*, National Tax Journal 55: 743-753.
- Brown, E. and H. Lankford (1992), *Gifts of Money and Gifts of Time Estimating the Effects of Tax Prices and Available Time*, Journal of Public Economics 47: 321-341.
- Chua, V. and C.M. Wong (1999), *Tax Incentives, Individual Characteristics, and Charitable Giving in Singapore*, International Journal of Social Economics 26: 1492-1504.
- Clotfelter, C. (1980), *Tax Incentives and Charitable Giving: Evidence from a Panel of Taxpayers*, Journal of Public Economics 13: 319-340.
- Clotfelter, C. (1985), *Federal Tax Policy and Charitable Giving*, Chicago.
- Clotfelter, C. and E. Steuerle (1981), *Charitable Contributions*, in: How Taxes Affect Economic Behavior, H. Aaron and J. Pechman (eds.), Washington: 403-446.
- Crumpler, H. and P.J.Grossman (2008), *An experimental test of warm glow giving*, Journal of Public Economics 92: 1011-1021.
- Duquette, C. (1999), *Is Charitable Giving by Nonitemizers Responsive to Tax Incentives? New Evidence*, National Tax Journal 52: 195-206.
- Feldstein, M. (1975), *The Income Tax and Charitable Contributions: Part I: Aggregate and Distributional Effects*, National Tax Journal 28: 81-100.

- Feldstein, M. and A. Taylor (1976), *The Income Tax and Charitable Contributions*, *Econometrica* 44: 1201-1222.
- Glenday, G, A. Gupta and H. Pawlak (1986), *Tax Incentives for Personal Charitable Contributions*, *Review of Economics and Statistics* 68: 688-693.
- Heckman, J.J. (1979), *Sample Selection Bias as a Specification Error*, *Econometrica* 47: 153-161.
- Hood, R.D., S.A. Martin and L.S. Osberg, *Economic Determinants of Individual Charitable Donations in Canada*, *Canadian Journal of Economics* 10: 653-669.
- Kingma, B.R. (1989), *An Accurate Measurement of the Crowd-Out Effect, Income Effect, and Price Effect for Charitable Contributions*, *Journal of Political Economy* 97: 1197-1207.
- O'Neil, C.J., R.S. Steinberg and G.R. Thompson (1996), *Reassessing the Tax-Favored Status of the Charitable Deduction for Gifts of Appreciated Assets*, *National Tax Journal* 49: 215-233.
- Paqué, K.-H. (1982), *The Efficiency of Public Support to Private Charity - An Econometric Analysis of the Income Tax Treatment of Charitable Contributions in the Federal Republic of Germany*, Kiel Working Paper No. 151, Kiel Institute of World Economics.
- Pelozo, J. and P. Steel (2005), *The Price Elasticities of Charitable Contributions: A Meta-Analysis*, *Journal of Public Policy and Marketing* 24: 260-272.
- Randolph, W. (1995), *Dynamic Income, Progressive Taxes, and the Timing of Charitable Contributions*, *Journal of Political Economy* 103: 709-738.
- Reece, W. (1979), *Charitable Contributions: New Evidence on Household Behavior*, *American Economic Review* 69: 142-151.
- Reece, W. and K. Zieschang (1985), *Consistent Estimation of the Impact of Tax Deductibility on the Level of Charitable Contributions*, *Econometrica* 53: 271-294.
- Schiff, J. (1985), *Does Government Spending Crowd Out Charitable Contributions?*, *National Tax Journal* 38: 535-546.
- Schwartz, R.A. (1970), *Personal Philanthropic Contributions*, *Journal of Political Economy* 78: 1264-1291.
- Steinberg, R. (1990), *Taxes and Giving: New Findings*, *Voluntas* 1: 61-79.
- Tiehen, L. (2001), *Tax Policy and Charitable Contributions of Money*, *National Tax Journal* 54: 707-723.

- Tobin, J. (1958), *Estimation of Relationships for Limited Dependent Variables*, *Econometrica* 26: 24-36.
- Warr, P.G. (1982), *Pareto Optimal Redistribution and Private Charity*, *Journal of Public Economics* 19: 131-138.
- Warr, P.G. (1983), *The Private Provision of a Public Good is Independent of the Distribution of Income*, *Economics Letters* 13: 207-211.
- Wooldridge, J.M. (2002), *Econometric Analysis of Cross Section and Panel Data*, Massachusetts.