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The hidden burden of the income tax: Compliance costs of German individuals

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The hidden burden of the income tax
Compliance costs of German individuals

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Abstract – We analyze the compliance costs of individual taxpayers resulting from the German income tax. Using survey data that has been raised between December 2008 and April 2009, we find evidence for a considerably higher cost burden of self-employed taxpayers. Taxable income and the demand for external support are positively correlated with compliance costs, while the time effort of female taxpayers is significantly lower. We also find evidence for a positive correlation of education and tax knowledge with the compliance burden. By contrast, a joint assessment of a married couple seems to reduce the monetized time effort. The aggregated cost burden of German income taxpayers amounts to 6.1-7.2 billion €, respectively 3.2-3.7 % of the income tax revenue in 2007. This estimate is higher than latest projections in a number of other European countries like Spain and Sweden, but significantly lower than results for the United States and Australia.

Jel Classification – H21, H23, H25, H26, H83

Keywords – Tax complexity, tax compliance costs, compliance burden, red tape, personal income tax

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1. Introduction

The economic costs of taxation do not only consist of the tax payment itself and the corresponding excess burden, but also of the time effort and the monetary expenses spent on tax compliance and tax planning activities. As these operations are at least partially caused by the high degree of tax complexity (for an etiology of tax complexity see Slemrod 2005), they are to be interpreted as an additional "tax effort" reducing the economic resources of individuals without increasing the fiscal budget of the government. From this perspective, compliance costs have a negative impact on the efficiency of a tax system (Alm 1996) and increase the marginal costs of funds (Slemrod and Yitzhaki 1996). In addition, tax compliance costs and tax complexity may influence the compliance with tax regulations including tax evasion and tax avoidance activities (Alm 1988, Alm 1999, Erard and Ho 2003). Therefore, the investigation of this hidden burden of a tax system is an important question of research.

While there has been a comprehensive literature on the compliance costs of individuals in Canada, the United States and Australia (Slemrod and Sorum 1984, Pitt and Slemrod 1989, Vaillancourt 1989, Pope and Fayle 1990, Blumenthal and Slemrod 1992, Pope 1995, Tran Nam et al. 2000, Guyton et al. 2003, Vaillancourt and Clemens 2008), there exists evidence only for a limited number of European countries (Sandford et al. 1989 for the UK, Malmer 1995 for Sweden, Diaz and Delgado 1995 and Delgado et al. 2001 for Spain, Klun 2004 for Slovenia and Blažić 2004 for Croatia). A review on the corresponding literature is given by Evans (2003).

Regarding the case of Germany as the largest EU economy, there have been two contributions on the compliance costs of individuals that are exclusively available in German language (Tiebel 1986 and RWI 2003). In addition, these studies do not allow for an aggregate estimate on the compliance burden of the German income tax. The investigation of Tiebel (1986) is clearly outdated and only poorly documented. The survey data of RWI (2003) has not been used for the projection of an aggregate cost-estimate and is publicly not available. Furthermore, the results of this study should be biased due to an oversampling of self-employed taxpayers and respondents with a high market income. Hence, the cost-efficiency of the German income tax system is still an open question.

There are specific properties of the German income tax that should be interesting from an international perspective. In contrast to self-reporting systems like in the U.S., German taxes on income are calculated by the fiscal authorities. Hence, the taxpayer is committed to declare the taxable income but not to calculate the tax payment. This may reduce the compliance costs of private households by cost of the administration. Furthermore, German wage earners are typically not obliged to file an income tax statement if their income does not include to a significant extent other sources than wage earnings. This results from the relatively detailed German pay-as-you-earn system (PAYE) and implies a reduction of compliance costs of private households by cost of the employers.

In addition to cost measurement, the identification of the key cost drivers is an important question of research. If the compliance burden is correlated to sources of income, we may expect that tax complexity does not only affect a household's economic resources but also economic decision-making. For example, Blumenthal and Slemrod (1992) observe considerably higher compliance costs for self-employed taxpayers that may negatively affect self-employment and impair economic growth (Djankov et al. 2002 and Grilo and Irigoyen 2006). Furthermore, the identification of the key cost drivers may help to simplify the tax system.

In contrast to the substantial number of surveys, the literature lacks in contributions analyzing the cost burden of private households by multivariate methods. Apart from Slemrod and Sorum (1984), Slemrod (1989), Vaillancourt (1989) and Blumenthal and Slemrod (1992), previous investigations are typically confined to descriptive analyses. Up to our knowledge, there is no study for a European country investigating the compliance cost burden of individuals by regression analysis. Therefore, results on the key cost drivers of individuals are broadly restricted to Canada and the United States.

In our contribution, we analyze the time effort and the monetary expenses of German self-employed persons and wage earners resulting from income tax regulations. Our investigation is based on a recent and representative survey raised between December 2008 and April 2009 within a project that was funded by the German Ministry of Finance. The data includes cost estimates as well as socio-economic information on private taxpayers and allows us to estimate for the first time the aggregate income tax compliance burden of German households on an empirical basis. Furthermore, we utilize for the first time multivariate methods to investigate the key cost drivers of the compliance burden of individuals in a European country.

We find that the compliance costs of German households amount to 6.1-7.2 billion € or 3.2-3.7 % of the personal income tax revenue in the tax year 2007 (including solidarity tax surcharge).[1] This is higher than latest empirical results for Sweden and Spain, but considerably lower than cost estimates for Australia and the United States. Combining our result with previous research, we find that compliance cost estimates of U.S. households are significantly higher compared to corresponding studies for European countries. Taking into account the diversity of methodologies, it does not seem probable that this outcome should be driven by differences in the methods of research.

Regarding the key cost drivers, we find a positive effect of taxable income and the use of external support, while there is no significant impact of age and the number of children. Corresponding to previous investigations, we state a considerably higher cost burden of self-employed taxpayers. There is also evidence for a positive correlation of compliance costs and education as well as tax knowledge, while we find a significantly lower time effort for females. Furthermore, our primary estimate implies that a joint assessment of a married couple reduces

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[1]   The solidarity tax surcharge is a supplement to the German personal and corporate income tax payment of typically 5.5 %.

compliance time per household by about 28 % to 33 %. This can be taken as evidence that a reduction of tax statements (for example by filing an income tax report each second year for wage-income earners or other groups of taxpayers with a relatively constant taxable income) could be an appropriate strategy to reduce the burden of red tape.

The paper is organized as follows. In section 2, we exemplify our data base including the sampling and the methodology of cost measurement. In section 3 we describe the multivariate analysis identifying the determinants of the compliance cost burden. The aggregate burden of the German income tax is projected in section 4 including a comparison to international estimates. Section 5 concludes. Further notes on methodological issues as well as additional regression results are included within the appendix.

2. Data set

2.1. Sampling and cost measurement

The data has been raised between December 2008 and April 2009 within a project funded by the German Ministry of Finance. The sample consists of 1,009 working individuals. To ensure that the sample matches the German population in terms of gender, age, education and monthly net income, respondents were selected based on a quota plan. Therefore, an exact response rate is not available. The corresponding frequency in the population was taken from the 2008 statistical yearbook for Germany (German Federal Statistical Office 2009), which covers 37 million people making up Germany's working population. With an error level of 5 %, no significant difference between the population and the sample could be identified in terms of gender, age, education and monthly net income.

Tax compliance cost estimates may be biased by misunderstandings, errors and mistakes of the survey participants. According to the literature (Sandford 1995, Blažić 2004), personal interviews are regarded as more reliable than mail or e-mail surveys. Furthermore, survey response is typically higher. Therefore, we opted for face-to-face interviews to ensure a high response rate as well as more accurate information. All interviewers were informed on the term "tax compliance costs" and other aspects of the questionnaire by a training seminar.

Within the literature on compliance cost measurement, there has been criticism on a potential overestimation of cost burdens resulting from survey methods (Sandford 1995). For example Tait (1988) argues that respondents could overstate their cost estimate to impose pressure on political authorities. For that reason, we decided to quantify the time effort of individuals on a careful basis.

According to the results of Klein-Blenkers (1980), there is a positive relationship between the number of compliance cost categories in a questionnaire and the resulting cost estimate.[2] Therefore, the questionnaire was restricted on two items for time effort that are considered to be most important and that are similar to RWI (2003) (time burden for the income tax return and for collecting receipts). In addition, we asked for the monetary expenses allocated to tax compliance (tax advisory services, software, tax literature etc.) as well as for the person who prepared the income tax return (taxpayer, spouse, tax preparer, other person). As cost estimates on third parties did not seem to be reliable, we did not account for questions on the time burden of unpaid helpers to prepare the income tax report.

Furthermore, the questionnaire included socio-economic information (age, marital status, sex, education level, number of children), the occupation of the taxpayer and the taxpayer´s spouse (self-employed, employed, public official, other), the level of tax knowledge and the geographic area (Eastern Germany and Western Germany). We regarded information on income to be a sensitive issue that could negatively affect survey response. Furthermore, not all German households are aware of their yearly taxable income. Therefore, we asked not for the household´s taxable income, but for monthly net income classes regarding the taxpayer and the taxpayer´s spouse. Using additional information on the employment status of the taxpayer, we were able to construct a proxy variable for taxable income. The corresponding methodology is described by appendix 7.1. An extract of the survey questionnaire is provided in appendix 7.2.

An important issue regarding the measurement of compliance costs is the valuation of the time effort. There is no universally accepted method regarding this aspect and that is one reason why international comparisons of compliance burdens are delicate. Pope (1995) describes six possible procedures of time valuation: (1) each individual´s own valuation of time (subjective estimate), (2) the individual´s valuation of time subject to a maximum value, (3) the overall payment to get rid of all compliance costs (subjective estimate), (4) the gross wage per hour, (5) the net wage per hour and (6) the median of subjective cost estimates. As has been reported by Blažić (2004), there are even more methods that have been adopted in the compliance cost literature (for example average GDP per capita by Allers 1994).

According to Wallschutzky (1995), taxpayer´s own valuations of the time burden may not be consistent over a number of repeated interviews. This could result in an overestimation of compliance costs. For that reason, we decided not to estimate the value of the time effort by subjective statements of a taxpayer. We also excluded economic average values that do not account for differences in the opportunity costs of individuals (for example GDP per capita). Assuming a neoclassic choice between labor and leisure, a rational taxpayer would assess a marginal working hour with its marginal value of consumption, respectively the net wage. However, this

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[2] Within his survey of German businesses, Klein-Blenkers (1980) asked for the time allocated to a number of compliance activities as well as for an aggregated time burden. On average, the aggregated time burden was about 50 % smaller compared to time effort for the sum of itemized compliance activities.

value does not hold from a social perspective if the alternative to compliance work is another income-generating activity (for example self-employment).[3]

As our primary and lower bound estimate, we assess the time burden by the net wage per hour. This rather conservative approach of cost measurement has already been adopted by Blumenthal and Slemrod (1992) and Blažić (2004). In addition, we derive an upper-bound estimate based on the gross wage that has been used by Vaillancourt and Clemens (2008). The pre-tax and the post-tax incomes per working hour for different income classes have been calculated on the basis of the German socio-economic panel (for a thorough description of the GSOEP see Wagner et al. 2007). We use the wage based on the actual working hours instead of the contractual working hours.

Expenses for tax advice, information material and software are partially deductible from the German tax base. A deduction is limited to business- and income-related items (e.g. for bookkeeping). The resulting effect depends on the marginal tax rate that varies from 14.8 % to 47.5 % (including solidarity tax surcharge). As our paper focuses on compliance costs from a social perspective,[4] we do not account for the tax-deductibility of monetary expenses. We also do not consider cash flow benefits resulting from the delay between the generation of profits and the payment of tax installments (for a detailed description on these effects see Blažić 2004). Due to the low interest rates and the relatively short periods for prepayments of German self-employed persons, these effects should have been rather low for German taxpayers.

2.2. Sample selection and descriptive statistics

As has been reported, not all employees of the German working population are obliged to file a tax return by reason of the PAYE system. As all necessary compliance activities of non-filers are conducted by the employer, this group of taxpayers does not bear a significant compliance burden. Regarding our survey, 265 participants (26.2 %) did not file an income tax return. This proportion is nearly identical to the rate of non-filers in the scientific use file of the German income tax statistics 2004 (for a thorough review of this data see German Federal Statistical Office 2008) and demonstrates a significant cost reduction of German households resulting from the PAYE system as well as the accuracy of our sample. Concentrating on households with a positive compliance burden, we excluded this group from our final sample.

In 212 cases the tax statements have been prepared by the spouse, by a relative or by a friend of a survey participant. Due to the fact that these respondents should not be able to appropriately estimate the costs of preparing the household´s tax return, we decided to exclude these cases from our final sample as well. Furthermore, we eliminated subjects who state that they do not

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[3] In these cases, an increase in compliance costs does not only reduce the economic resources of the taxpayer but also the tax and social security payments of the government.

[4] Corresponding to the terminology of Tran-Nam et al. (2000), we focus on social compliance costs and not on taxpayer compliance costs.

bear monetary expenses because they have access to costless tax return preparation (23 cases). As we do not account for the time burden of external helpers, an inclusion of these cases would bias our estimate.

Finally, we excluded all cases with missing information on aspects of the cost burden or inconsistent cost estimates (52 cases). Our final sample includes 457 subjects with information on compliance time and monetary expenses, 47 % of them using a professional tax advisor to prepare the income tax return. The descriptive statistics on socio-economic factors of this sample are displayed in Table 1.

[Table 1 about here]

Most of the respondents in our final sample are males (about 60 %), employees (74 %) and do not have children entitled to child benefits (61 %).[5] About half of the respondents are married and more than 86 % claim to have at least limited tax knowledge. Most respondents are middle-aged (about 81 % have an age between 26 and 55 years), while the education level is relatively high (with about 26 % having a university degree). Regarding taxable income, most of our households (79 %) do not earn more than 60,000 €.

In table 2, we present mean values of the compliance cost burden for various subsamples of our final data set using the net income for time valuation purposes. Alternative estimates if we adopt gross income for time valuation are included in table 3. On average, a survey respondent spends 10.6 hours on collecting receipts and preparing the income tax return. In previous German studies, Tiebel (1986) reports on average 11.2 hours of a German household (including the compliance costs of the German wealth tax), while RWI (2003) estimates the time effort with 15.8 hours. Taking into account that RWI (2003) oversamples the number of self-employed as well as the number of taxpayers with a high market income, our estimate does not seem to be unrealistic.

[Table 2 about here]

Almost two thirds of the time burden results from the collection of receipts. Therefore, the documentation requirements in calculating taxable income are the most time-consuming compliance activity. This corresponds to previous research on the compliance costs of income taxation in Germany (RWI 2003) and other countries (Vaillancourt 1989, Blumenthal and Slemrod 1992, Delgado et al. 2001). In addition to the time effort, an average respondent in our data has monetary expenses amounting to 212 €.

Including a monetized time burden of 131 € with average costs per hour of 12.32 €, this leads to total compliance costs of 342 €. Using the gross income per hour of 19.06 € for time measure-

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5   Within the German income tax system, parents receive a child benefit if their children are younger than 18 years. In specified cases (for example unemployed children or children in education) the age limit is increased to 21 or 25 years.

ment purposes, the monetized time burden would increase to 202 € and the total compliance costs to 414 €. The average time burden per hour varies from 6.39 € for taxpayers with a taxable income up to 20,000 € and 17.58 € for respondents with a taxable income above 80,000 € (respectively 10.04 € to 26.74 € using gross income for time valuation).

Comparing the compliance burden to the household´s taxable income, each respondent on average has to bear compliance costs of 1.1 % of his taxable income. Valuing time effort with gross income, this relative burden would increase to 1.3 %. These estimates are lower than relative cost burdens of RWI (2003) ranging from 0.8 % to 3.7 % for different income groups, but correspond to international estimates. For example Slemrod and Sorum (1984) report average costs of 1.4 % of taxable income, while the estimate of Tran-Nam et al. (2000) lies in a range from 0.6 % to 1.5 %.

According to our data, average monetary expenses are making up 62 % of the total costs (51 % if we choose gross income for time valuation). The high relevance of monetary expenses results from the fact that 47 % of all tax statements in our final sample are prepared by a tax adviser. However, in our original data the fraction of prepared tax reports is only 38 %. This is due to our sampling procedure excluding cases if a tax statement has been filed by a third person. Accounting for that bias by a weighting scheme, we obtain alternative estimates for the monetary expenses to overall costs of 59 % respectively 49 %.

These estimates correspond to Sandford et al. (1989), but contrast other studies like Allers (1994) and RWI (2003) who report a monetized time effort of about 2/3 of the overall cost burden. This could be explained by the following aspects. (1) As has been elucidated above, RWI (2003) over-samples taxpayers with high compliance costs. (2) Compared to RWI (2003), our study derives a rather conservative estimate on the monetized time effort increasing the fraction of monetary expenses. (3) According to the literature (McKinstry and Baldry 1997), there is a growing interest in tax advice. Therefore, it should be expected that the proportion of monetary expenses is increasing over time.

[Table 3 about here]

As has been reported by previous research (Blumenthal and Slemrod 1992, Tran-Nam et al. 2000), the burden is unequally distributed among taxpayers. From tables 2 and 3 it becomes obvious that compliance costs are especially correlated to the use of professional tax advice, taxable income and self-employment. The average cost of a self-preparer is 119 € (175 € if we would choose the gross income for time valuation). That is only about 20 % (25 %) of the costs of individuals who use a professional tax preparer. Corresponding to previous studies (Slemrod and Sorum 1984, Tran-Nam et al. 2000, Guyton et al. 2003, RWI 2003), employees and other taxpayers bear only 24 % (25 % if we choose the gross income for time valuation) of the average cost of a self-employed subject.

Similar to Blažić (2004), compliance costs are positively correlated with taxable income. Individuals in the lowest income group (taxable income < 20,000 €) devote 182 € on income tax compliance, whereas individuals in the highest income tax group spend 592 €. Using gross income for time valuation yields to alternative values of 204 € and 691 €. The especially high cost burden of taxpayers with taxable income ranging from 60,001 € to 80,000 € results from a correlation of taxable income and self-employment.

The descriptive analysis also indicates that gender, marital status and tax knowledge may affect compliance costs. Men spend on average 1.3 % (1.5 % if we choose the gross income for time valuation) of their taxable income on tax compliance, while the effort of a woman amounts to about 0.8 % (respectively 1.0 %) of taxable income. Unmarried persons expend 1.4 % (1.6 % if we choose the gross income for time valuation) of their taxable income, but married persons only 0.8 % (respectively 0.9 %). Finally, subjects who declare that they have at least moderate knowledge of tax law bear higher costs (1.1 % respectively 1.3 % of taxable income) than those who assessed themselves to have no tax knowledge (0.9 % respectively 1.1 % of taxable income). Regarding age, education, and the number of children, the descriptive analysis reveals no clear effect. However, these descriptive results should be interpreted with caution. To separate the joint effects of the collected independent variables, we conduct a multivariate analysis that is presented in the following section.

3. Multivariate analysis

3.1. Estimation approach

According to the literature (Vaillancourt 1989, Blumenthal and Slemrod 1992), we analyze the compliance burden of German households by an OLS model. We account for heteroskedasticity by the use of heteroskedasticity-robust standard errors. Due to economies of scale within the compliance process (especially in case of the self-employed taxpayers in our data), we choose a logarithmic specification. Hence, we examine the correlation of the logarithm of compliance costs compared to the exogenous factors. As the coefficients of a linear logarithmic model can be interpreted as elasticities, this approach allows us to analyze relative changes of the cost burden. For example a regression coefficient of -0.3 implies that an increase in the exogenous variable of 1 % reduces compliance costs by 0.3 %. Furthermore, this specification ensures normality of the distribution of the model´s residuals. The equation can be described by:

$$
\begin{aligned}
CCOST = \alpha_0 &+ \alpha_1 \cdot \text{TAXABLE INCOME} + \alpha_2 \cdot \text{AGE} + \alpha_3 \cdot \text{SELF} - \text{EMPLOYMENT} \\
&+ \alpha_4 \cdot \text{JOINT ASSESSMENT} + \alpha_5 \cdot \text{UNIVERSITY DEGREE} \\
&+ \alpha_6 \cdot \text{WOMAN} + \alpha_7 \cdot \text{CHILDREN} + \alpha_8 \cdot \text{TAX KNOWLEGDE} + \alpha_9 \cdot \text{ADVICE} + \varepsilon
\end{aligned} \tag{1}
$$

The error is described by ε, while α_0 to α_9 denote the correlation coefficients. The variables are defined as follows:

CCOST	Compliance costs are calculated as the logarithm of the sum of monetary expenses and the monetized time burden. In alternative specifications, we analyze also the logarithm of the cost components (time burden and money burden).
TAXABLE INCOME	Logarithm of taxable income: we estimate taxable income by a procedure described in appendix 7.1.
AGE	Logarithm of the age of our survey respondents
SELF-EMPLOYMENT	Dummy variable for self-employed taxpayers
JOINT ASSESSMENT	Married couples in Germany are entitled to a joint tax return. Due to economies of scale, this could result in a decrease of the cost burden compared to individual tax statements. To control for the effect of joint returns on the compliance burden, we include a dummy variable for married couples who are dual-income earners.
UNIVERSITY DEGREE	Dummy variable for taxpayers with a university degree
WOMAN	Dummy variable for female taxpayers
CHILDREN	The German tax law includes child benefits depending on the number of children. Therefore, we include the logarithm of the number of children entitled to child benefits increased by 1.[6]
TAX KNOWLEDGE	Dummy variable for taxpayers who claim to have at least moderate tax knowledge
ADVICE	The variable accounts for the use of external advisers. We use two alternative specifications. In models analyzing the overall compliance costs, we include the proportion of monetary expenses to the overall cost burden. Hence, we measure the extent of outsourcing compliance activities (for a similar approach see Eichfelder and Schorn 2009). In models analyzing monetary expenses or the monetized time burden, we use a dummy variable for tax returns that are prepared by a tax adviser.[7]

Due to the fact that the use of external advisers and the experiences with tax legislation may be affected by tax complexity, the variables TAX KNOWLEGDE and ADVICE can be partially in-

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[6] We increase the number of children by one to obtain a logarithm of zero for households with no children.

[7] The proportion of monetary expenses to overall compliance costs would be endogenous in the corresponding models.

terpreted as endogenous. For that reason, we do not consider these variables in each specification of our model.

Our OLS regression could be biased by the fact that we exclude a considerable number of observations from our final sample. Therefore, we estimated a two-stage Heckman sample selection procedure (Heckman 1979) for control purposes. Within the probit selection equation, we accounted for all cases excluded from our final sample. Apart from ADVICE, we included the identical independent variables as in our original specification. As can be demonstrated by the insignificant results on the inverse Mills ratios in table 9 (see appendix 7.3.), we do not find any evidence for a sample selection bias. The same holds for additional specifications of our model in appendix 7.4.

3.2. Results

Table 4 documents the regression results of our primary specification for overall compliance costs, monetary expenses and the monetized time burden using the net income for time valuation purposes. Corresponding test statistics are reported in appendix 7.3.

[Table 4 about here]

Corresponding to Vaillancourt (1989) and Blumenthal and Slemrod (1992), we find a positive correlation between compliance costs and taxable income. This should result from three different aspects. (1) The complexity of a tax return as well as the amount of bookkeeping obligations increase in taxable income. (2) The interest in tax planning is positively correlated with taxable income[8] and (3) the value of time allocated to tax compliance increases in taxable income. As a result from (3), the impact of taxable income on the monetized time burden (models 3, 4) is clearly stronger than the effect on monetary expenses (models 5, 6). The correlation coefficients for TAXABLE INCOME in table 3 are clearly smaller than one. That implies a regressive relationship between compliance costs and income. Hence, the relative cost burden per taxable income should be higher for taxpayers with a low taxable income.

As has been documented by the literature (Vaillancourt 1989, Blumenthal and Slemrod 1992 and Guyton et al. 2003), we find a strong and positive effect of self-employment on the compliance burden. That can be explained by the fact that bookkeeping and compliance obligations are more complex for self-employed taxpayers. Furthermore, the German PAYE system implies a cost reduction for wage earners. While German employers are obliged to comply with the information requirements of wage taxes and social insurance contributions, their employees may use the information of payroll accounting to file their income tax report.

As self-employed persons are more interested in external support (Slemrod 1989) and should be more experienced with tax regulations, it seems to be appropriate to concentrate on the models

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[8] Correspondingly, Long and Caudill (1993) find a positive correlation between the marginal tax rate and the demand for tax advice.

excluding ADVICE and TAX KNOWLEGDE to derive a quantitative estimate. According to our models 1, 3, and 5, self-employment increases the cost burden by 155 %, the time burden by 69 % and monetary expenses by 198 %. Corresponding to other dummy variables in logarithmic OLS models, these absolute effects of self-employment are higher than the regression coefficients in table 4 that are measuring marginal effects (Halvorsen and Palmquist 1980).

We find further a negative correlation for JOINT ASSESSMENT and compliance costs. That outcome holds especially for the time burden and is to some extent supported by (weak) empirical evidence on the effect of marital status (Slemrod and Sorum 1984 and Vaillancourt 1989). The effect should mainly result from economies of scale. While each taxpayer of a single household is obliged to file an income tax return, there is only one tax statement for joint filers. According to our estimate, including the information of two persons into one tax return reduces the time burden by 28 % to 33 %. This outcome implies that a reduction of tax returns (for example by demanding a tax return for each second year) could yield a significant reduction of compliance costs.

We also find a positive correlation between UNIVERSITY DEGREE and the monetized time effort. By contrast, there is a negative, but not significant correlation coefficient for a university degree and the amount of monetary expenses. There are the following explanations for this regression result. (1) The personal circumstances of taxpayers with a university degree are more complex by exogenous reasons (for example due to expenses for business trips, business lunch, etc.). (2) Taxpayers with a university degree are more interested in compliance work and tax planning. (3) Due to their higher qualification, taxpayers with a university degree care about their tax affairs on their own resulting in a higher time burden, but not necessarily a higher cost burden. Our result is to a limited extent supported by Slemrod and Sorum (1984) and Vaillancourt (1989) who find weak evidence for a positive correlation of education and compliance costs.

Similar to Vaillancourt (1989) we also find that the time burden of female taxpayers is significantly lower. Assuming that male taxpayers are more risk-seeking and interested in aggressive tax planning strategies (Croson and Gneezy 2009), our result is not surprising. From this perspective, while male taxpayers concentrate on a reduction of their tax payment (implying higher compliance costs), women seem to be more interested in a reduction of their time effort (implying lower compliance costs).

Furthermore, we can state a positive effect of TAX KNOWLEGDE that holds especially for monetary expenses. By reason of the potential endogeneity of this variable, the interpretation is not straightforward. On the one hand, taxpayers with at least limited tax knowledge may be aware of possible deductions and tax-related problems. Therefore, these taxpayers should be more willing to spend monetary resources on external support. On the other hand, taxpayers that receive external advice enhance their knowledge on taxation. Therefore, tax knowledge could also be a result of allocating monetary expenses to an external adviser.

There is also a significant correlation between compliance costs and the use of external advisers (ADVICE). The positive effect on monetary expenses and the negative effect on the time burden suggest that outsourcing compliance activities reduces the time burden of the taxpayer and causes additional expenses. This corresponds to the hypothesis that time effort may be substituted by external support. The overall impact of external advice (defined as the proportion of monetary expenses to the overall cost burden) on compliance costs is positive and highly significant.

This outcome can be justified by rational decision-making of a private taxpayer. Assuming a higher degree of tax knowledge of external advisers, we would expect that the propensity to use paid preparation increases in the complexity of a tax return. Therefore, we may interpret a high proportion of expenses for external support as proxy for a complex tax statement. Correspondingly, we would not obtain a significant effect for the proportion of monetary expenses to overall compliance costs (as proxy for the degree of using tax preparers) if we restrict our analysis to households with paid preparation.[9]

Finally, we do not find significant results for AGE or for the number of children entitled to child benefits. Hence, there is no empirical evidence that child benefits of the German income tax system increase the compliance burden of German households to a significant extent. This should be due to the fact that child benefits typically do not result in noteworthy filing effort for German households. The number of qualified children is documented on the wage tax card and administrated by the fiscal authorities in cooperation with the employer. Administrative obligations of a household arise especially for children of full age due to the exemption limits of a child´s income. However, this effect should not be perceptible in our data.

In appendix 7.4., we tested a number of robustness checks controlling for linearity, sampling weights correcting for a representative distribution and the valuation of the time burden by gross income instead of net income. These additional calculations support basically the outcome of our primary specification with the following exceptions. Regarding an alternative specification of our parameters to control for linearity, the effect of JOINT ASSESSMENT is only significant on a 10 % level (table 10). Controlling for weighting parameters, we obtain exclusively one specification with a significant outcome for JOINT ASSESSMENT and UNIVERSITY DEGREE (table 14). In addition, we do not find any significant result for TAX KNOWLEDGE if we use sampling weights. By contrast, the choice of gross income for time valuation does not affect the significance of our exogenous variables to a considerable extent (table 17). Concluding, the effects of JOINT ASSESSMENT, UNIVERSITY DEGREE and TAX KNOWLEDGE should be interpreted more cautiously if we consider our additional regression results in appendix 7.4.

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[9]   Therefore, our result does not contrast the findings of Eichfelder and Schorn (2009) who find a negative correlation between compliance costs and the degree of outsourcing compliance activities to tax preparers for a sample of German businesses.

4.   Aggregate burden of the German income tax

In this section, we use the information of our data to project the aggregate private cost burden of the German income tax. Comparing this cost burden to tax revenue, we are able to derive an estimate for the cost-efficiency of the German income tax system. We extrapolate the aggregate cost burden on the basis of costs per taxable income. Taking into account that self-employment has been identified as an important cost driver (Slemrod and Sorum 1984, Tran-Nam et al. 2000, Guyton et al. 2003), we differentiate between the compliance costs of self-employed persons and other taxpayers (almost exclusively employees and public officials) regarding four different classes of taxable income (0 to 22,000 €; 22,001 to 42,000 €; 42,001 to 62,000 €; above 62,000 €). In order to prevent cost projections driven by outliers, our income classes have been selected to include a minimum of 25 survey respondents per table cell.

It has already been mentioned that we excluded households if the tax statement has been prepared by a spouse or another household member. This results in an oversampling of tax returns prepared by external advisers that could bias our extrapolation. Therefore, we estimate weighting parameters controlling for the original distribution of paid preparation compared to self-preparation. Weighted relative cost burdens based on a monetized time effort using net income and gross income per hour are documented by table 5.[10]

[Table 5 about here]

We find higher relative cost burdens for self-employed persons and households with a low taxable income. That corresponds to economies of scale that have been documented in the literature (Sandford et al. 1989, Tran-Nam et al. 2000, Blažić 2004). The economies of scale regarding other taxpayers do not seem to be as strong as for self-employed taxpayers. This outcome corresponds to international contributions as well (Sandford et al. 1989, Pope and Fayle 1990).

We use the scientific use file of income tax statistics of the German Federal Statistical Office to extrapolate the aggregate cost burden (for a thorough review of this data see German Federal Statistical Office 2008). The latest micro file available is from 2004. As our data has been collected in 2008 and 2009, we correct the taxable income in our statistical data by the index of gross wages in Germany from 2004 to 2008. Hence, we increase the taxable income in the data of the German Federal Statistical Office by about 7.4 %.[11]

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[10]   In each income class, we calculated the ratio of the average costs per average taxable income instead of the average of the costs per taxable income ratios. This is to prevent a strong influence of households with a very high ratio of costs per taxable income.

[11]   See for the index of German gross wages http://www.destatis.de/jetspeed/portal/ cms/Sites/destatis/Internet/DE/Content/Statistiken/VerdiensteArbeitskosten/ArbeitsLohnneb enkosten/Arbeitskosten/Tabellen/Content75/IndexJaehrlich,templateId=renderPrint.psml (request from the 2d of April 2011).

Costs are calculated by the proportion of compliance costs to taxable income as documented in table 5. Regarding cases with a negative or zero taxable income, we assume a cost burden of 432 € for self-employed persons and of 101 € for other taxpayers. These are the average compliance costs for households in the lowest income class (0 € to 22,000 €). In case of time valuation using gross income, the corresponding cost burdens are 493 € and 118 €.

We estimate the compliance costs of German households resulting from income taxation with 6.1-7.2 billion €. That is about 3.2-3.7 % of the German income tax revenue in the tax year of 2007 (including solidarity tax surcharge). Weighting our data by the distribution of households in the German income tax statistics 2004, we obtain an average time effort of 7.7 hours for each household filing an income tax return. Accounting for the fact that 26.1 % of the households in the German income tax statistics 2004 do not file an income tax return, the average time effort is reduced to 5.7 hours per household. The following table compares our outcome to international evidence.

[Table 6 about here]

We find that the compliance costs of German households are medium-sized in relation to other estimates. While households in latest studies in Spain (Delgado et al. 2001) as well as in Slovenia, Croatia and Sweden seem to have a lower burden of red tape resulting from the income tax, cost estimates for the U.S. and Australia are generally higher. Furthermore, the average time burden of U.S. households is significantly higher than all European estimates that are presented in table 6. Taking into account the diversity of survey designs between the various European and U.S.-studies, it does not seem to be probable that this outcome is mainly driven by methodological issues. Hence, the results of table 6 can be taken as evidence for considerably higher income tax compliance costs of U.S. households compared to households in European countries.

A possible explanation for this outcome could be the self-assessment system of the U.S. Federal income tax. U.S. citizens are obliged to calculate their tax payments themselves. By contrast, German households are exclusively obligated to file their income tax statement, while the tax payment is calculated by the German fiscal administration. Furthermore, a fraction of about 26.1 % of the German taxpaying population does not file an income tax return by reason of the German PAYE system. German wage earners may also use the information of payroll accounting as basis for filing their income tax return. This implies an additional cost reduction of German households by the cost of German employers.

Nevertheless, it should be taken into account that international comparisons on the basis of existing studies should be biased by differences of tax systems and methodological issues. There are at least five different aspects of a potential bias.

(1) We find considerable differences in terms of the sampling methodology. For example, Klun (2004) and Blažić (2004) do not include small businesses and self-employed taxpayers within their data set that are part of our survey and bear significantly higher

compliance costs. Therefore, the estimates for Slovenia and Croatia should be biased downwards if there are compared to our aggregate cost burden.

(2) There are significant differences in the methods of data collection (personal interviews, mail surveys, telephone surveys) and in the design of survey questionnaires. As has been argued in section 2, the size of the cost estimate should depend on the requested number of compliance activities as well as on the definition and description of the term "tax compliance costs".

(3) The valuation of the time effort is not standardized. For example, Pope and Fayle (1990) use a considerably higher cost value per hour than Tran-Nam et al. (2000) who also analyze the compliance burden of Australian wage earners and self-employed persons.

(4) The cost burden per tax revenue is significantly affected by the tax rate. Hence, a low tax rate implies a comparatively high proportion of compliance costs in relation to tax revenue. From a comparative perspective, the average time effort per taxpayer is therefore an important information.

(5) There exist additional compliance costs, costs of the tax administration and tax revenues that are not included within the cost estimates in table 6. Regarding Allers (1994), the cost fraction depends on the fact whether the burden of private households is compared to all income tax payments (including payments deducted at source) or exclusively to tax revenues resulting from income tax statements. Furthermore, the Dutch PAYE system implies compliance effort for employers not taken into account within the estimate of table 6.

The fifth aspect holds likewise for our study. However, as the calculation of wage taxes and social insurance contributions is a uniform process, it seems to be delicate to differentiate between compliance costs of German wage taxes and the administrative burden of social insurance contributions (Sandford et al. 1989 and Vaillancourt 1989). Using cost estimates of data raised by order of the German Ministry of Economics and Labor in 2003, we can derive a minimum cost value of about 14 billion € for the sum of German wage taxes and social insurance contributions (Kayser et al. 2004).[12] This amounts to about 2.7 % of the revenue collected (including solidarity tax surcharge and social insurance contributions).[13]

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[12] This value is a lower bound for the corresponding cost burden. Kayser et al. (2004) calculate only an explicit burden for the compliance costs of social security contributions. Taking into account the relatively high value of this estimate, it seems to be likely that this burden includes compliance costs of wage taxes as well. We use the price index of the German Federal Statistical Office for tax advice to correct the data of Kayser et al. (2004) to the year of 2007.

[13] The solidarity tax surcharge revenue has been proportionately allocated to wage taxes, other personal income taxes and corporate income taxes (German Federal Statistical Office 2009).

Assuming an identical cost-efficiency of wage taxes and social insurance contributions, we can derive a cost burden of 3.8 billion € of German employers resulting from wage taxation. According to calculations of the fiscal administration in the German state of Nordrhein-Westfalen (RWI 2003), the administrative costs of the German personal income tax are estimated with 1.9 % of tax revenue (3.5 billion €). Including all cost elements (compliance costs of households and employers as well as administrative costs), we obtain minimum operating costs of the German personal income tax (including corresponding solidarity tax surcharge payments) ranging from 13.4-14.5 billion € or 6.9-7.5 % of the tax revenue in 2007.

5. Conclusion

Within our paper, we analyzed the compliance burden of German households resulting from the income tax. We found strong evidence that self-employment increases the burden of red tape to a considerable extent. While the average costs of self-employed taxpayers amount to 786 € (932 € if we choose gross income for time valuation), other taxpayers (almost exclusively employees and public officials) bear on average 189 € (respectively 235 €). Our primary estimate implies that self-employment increases the cost burden by about 155 %.

Taking into account that the tax obligations of German small businesses and self-employed persons do not only include compliance activities for income tax purposes, but also duties resulting from the value added tax, local business taxes and (in case of an employer) wage taxes and social insurance contributions, the burden of red tape may not only affect the economic resources of private households but also interfere their economic decision-making. Corresponding to Djonkov et al. (2002), market entry costs can negatively affect economic efficiency. Furthermore, Grilo and Irigoyen (2006) find evidence that self-employment is negatively affected by perceived administrative complexity.

We also find that income and the demand for external advice are positively correlated with compliance burdens. Furthermore, the time burden of taxpayers with a university degree is significantly higher, while the effort of female taxpayers is considerably lower. This outcome could be partially driven by the fact that some groups of taxpayers are more interested in tax planning. If well-educated or male taxpayers have lower marginal planning costs or higher preferences for aggressive planning strategies, this should result in higher cost burdens. This argument is supported by the positive correlation of tax knowledge and compliance costs in our data set. However, Murphy (2004) finds by contrast that education is negatively correlated with aggressive planning strategies of Australian taxpayers. Furthermore, the effect of education is not significant in all our models. Hence, additional research should be necessary to analyze the question, if and why education significantly affects the burden of red tape.

There is evidence that a joint assessment of dual-income earners results in a significant reduction of compliance time. This outcome can be explained by economies of scale that have been also documented in relation to other aspects of the compliance process (Sandford et al. 1989, Allers 1994). From this perspective, a reduction of tax returns should result in a cost reduction even if it does not affect the information required by the fiscal authorities. This can be taken as an argument that reducing the number of tax statements could be a promising strategy to decrease administrative cost burdens. For example, wage earners and other taxpayers with a tax deduction at source shall only have to file a tax return each second year according to a recent German draft legislation. Taking into account that most German wage earners file a tax return despite of the PAYE system, it could be even more promising to increase incentives of wage earners for non-filing a tax return (for example by a "non-filing tax credit").

The aggregate burden of private households resulting from German income taxation lies in a range of 3.2-3.7 % of the income tax revenue (including solidarity tax surcharge). This proportion is higher than latest cost estimates in other European countries like Sweden and Spain, but considerably lower than corresponding results for Australia and the U.S. The very high cost estimates and time burdens of the U.S. households in relation to Germany and other European countries could partially be driven by the U.S. self-assessment system as well as by the German PAYE system implying a cost reduction for wage earners. Furthermore, the U.S. income tax system includes a number of complex aspects and regulations that are not part of the German tax system (alternative minimum tax, state income taxes in addition to the federal income tax, earned-income tax credit and other issues).

It should be taken into account that international comparisons on compliance cost burdens are typically biased by methodological issues including the sampling of taxpayers and the valuation of the time burden. From this perspective, comparative studies will be necessary to get a deeper understanding of the main causes of tax complexity as well as the main possibilities for tax simplification. A corresponding approach seems to be promising to answer the question of Slemrod (1996), which is the simplest tax system of them all.

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7. Appendices

7.1. Calculation of taxable income

As has been elucidated above, most German households are probably not aware of their yearly taxable income. Therefore, we asked our respondents for the monthly net income regarding the taxpayer and the taxpayer´s spouse. In addition, questions on income are often associated with high non-response. Therefore, we did not ask for the exact amount of net income, but for the following net income classes:

- Less than 1,000 €

- 1,000 € to 2,000 €

- 2,000 € to 3,000 €

- More than 3,000 €

In order to measure a household's taxable income, we collected additional data concerning age, marital status, obligation of the respondent and the respondent´s spouse to pay social insurance contributions and the number of children eligible for child benefits.

Based on this data we calculated for each subject the taxable income that corresponds with the lower and the upper bound of the subject's net income category. To obtain a metric variable, the average of the lower and the upper taxable income of the category is selected as a proxy for the subject's taxable income. Subjects that selected the highest category were assigned a value equal to 1.5 times the lower bound (4,500 €).

In order to derive the taxable income from the net income we assumed that taxpayers use standard deductions instead of itemizing deductions. In particular, we consider the following standard deductions: standard deduction for insurance contributions, standard deduction for special private expenses and standard deduction for work-related expenses (exclusively for non-self-employed taxpayers). Furthermore, we assume a joint assessment of married couples. Concerning the amount of health insurance contributions we based our calculations on average contribution rates.

Finally, for calculating the taxable income we had to solve the following equations:

a. Taxable income = Pre-Tax Income – Standard Deduction for Insurance Contributions – Standard Deduction for Special Private Expenses - Standard Deduction for Work-Related Expenses.
b. Pre-Tax-Income – Social Security Contributions – Income Taxes = Post-Tax Income

Taking into account the tax scale as well as the calculation instructions for the German social insurance contributions, we expanded the 2008 wage tax program procedure plan of the German Federal Ministry of Finance to solve these equations iteratively.

7.2. Survey questionnaire (extract)

1. Who prepared your last tax return?

   O On my own
   O Someone else in the household
   O A Tax Advisor
   O Did not file a tax return *(Attention: please go on with question 4)*
   O Other

   _____

2. How much money did you spend on your last income tax return, e.g. for tax advisory services, tax advisory books or software, or the like?

   _____ €

   _____

3. How much time (in hours) did you spend on both the preparation of your last income tax return and the collection of the needed receipts?

   _____ hours for the preparation of the tax return

   _____ hours for the collection of the receipts

   _____

4. How do you assess your own knowledge regarding tax law?

   O No knowledge
   O Some basic knowledge
   O Good or very good knowledge

   _____

5. Age:

   _____ years

   _____

6. Gender:

   O Male

      ◯ Female

_____

7.   Your highest education:

      ◯ University degree
      ◯ University-entrance qualification
      ◯ Secondary school leaving certificate
      ◯ Lower secondary school leaving certificate
      ◯ No graduation
      ◯ Other

_____

8.   What is your occupation?

      ◯ Public Official
      ◯ Employee
      ◯ Self-employed
      ◯ No occupation

_____

9.   Do you have children?

      ◯ yes
      ◯ no   *(Attention: please go on with question 11)*

_____

10.   For how many children do you receive child benefits?

    _____ children

_____

11.   Please sum up how much of your own monthly income is left after deduction of income taxes and social insurance contributions. Which class do you belong to?

      ◯ < 1.000 €
      ◯   1.000 – 2.000 €
      ◯   2.001 – 3.000 €
      ◯ > 3.000 €

_____

12.   Your marital status?

- Married
- Unmarried
- Divorced/Widowed
- Other

If married please go on with question 13, otherwise:

Thank you very much for your participation!
_____

13.   What is your spouse's occupation?

- Public Official
- Employee
- Self-employed
- No occupation

If no occupation: *Thank you very much for your participation!*
Otherwise: ***Please go on with question 14***
_____

14.   Now, our last question: Please sum up how much of your spouse's monthly income is left after deduction of income taxes and social insurance contributions. Which class does your spouse belong to?

- <   1.000 €
-     1.000 – 2.000 €
-     2.001 – 3.000 €
- >   3.000 €

Thank you very much for your participation!

_____

7.3. Test statistics

In this appendix, we present test statistics for the regression results presented in 3.2. We tested for linearity by the inclusion of an additional variable for taxable income (the squared value of TAXABLE INCOME). In this specification, the regression analysis is severely affected by multicollinearity resulting in variance inflation factors that are higher than 400. Furthermore, we obtained similar regression results for an alternative model structure testing for linearity (see appendix 7.4.1.). Therefore, non-linear correlations should not bias our regression results.

Testing for heteroskedasticity, we found significant correlations of the squared residuals and a number of independent variables (especially for TAXABLE INCOME and SELF EMPLOYMENT). For that reason, we use standard errors within our regression that are robust for heteroskedasticity.

Table 7 documents the variance inflation factors of our primary specification in table 4. As all factors are clearly smaller than 2, there is no sign that multicollinearity could be an estimation problem.

[Table 7 about here]

Within table 8, we document the results of a Kolmogorov-Smirnov test regarding the normality within the distribution of the model´s residuals. We do not find significant evidence for a non-normal distribution.

[Table 8 about here]

Table 9 includes our estimates for the inverse Mills ratios of the Heckman sample selection model. We do not obtain any statistically significant result.

[Table 9 about here]

7.4. Robustness checks

7.4.1. Linearity

Our regression results could be biased by the fact that the correlation of the logarithm of compliance costs to exogenous parameters is non-linear. For that reason, we include in this appendix additional calculations that are exclusively based on dummy variables. This results in the following alternative specifications:

TAXABLE INCOME   Instead of the logarithm of taxable income, we include dummy variables for income brackets from up to 20.000 € to more than 80,000 €.

AGE	Instead of the logarithm of taxpayer's age, we include dummy variables for different age groups from up to 25 years to more than 55 years.
CHILDREN	We account for child benefits by a dummy variable with a value of one for households with at least one child being entitled for a child benefit.
ADVICE	In models analyzing the overall cost burden, we include dummy variables representing the proportion of monetary expenses to overall compliance costs. The lowest proportion is zero (self-prepared tax return without any monetary expenses) and the highest proportion is more than 80 percent. As this variable would be obviously endogenous for models analyzing the monetary burden or the time burden, we include in these models a dummy variable for tax returns that are prepared by a tax adviser.

Table 10 documents the regression results of our alternative specifications. The outcome corresponds to our primary regression model. However, JOINT ASSESSMENT is only significant on a 10 % level.

[Table 10 about here]

Table 11 documents the variance inflation factors of this alternative specification. As a result of the higher number of variables, inflation factors are higher than in our primary specification. That holds especially for the variables accounting for tax preparer usage. Nevertheless, all variance inflation factors are clearly smaller than 4. Therefore, multicollinearity cannot be regarded as a serious problem.

[Table 11 about here]

Within table 12, we document the results of a Kolmogorov-Smirnov test regarding the normality within the distribution of the model´s residuals. We do not find significant evidence for a non-normal distribution.

[Table 12 about here]

Table 13 includes our estimates for the inverse Mills ratios of the Heckman sample selection model. We do not obtain any statistically significant result.

[Table 13 about here]

7.4.2. Weighting factors

In our primary regression model we do not account for the distribution of the different groups of taxpayers in the German population. In addition we do not consider the overweighting of tax declarations filed by a tax preparer in our final sample. Therefore, we calculated additional regression results using identical weighting factors as for the projection of the compliance cost burden in section 4. Table 14 documents these alternative regression results that are similar to the outcome of our primary specification. However, JOINT ASSESSMENT and UNIVERSITY DEGREE are only significant in one model and we do not obtain a significant result for TAX KNOWLEDGE.

[Table 14 about here]

Table 15 documents the variance inflation factors corresponding to the regression results in table 14. We do not find any evidence for multicollinearity.

[Table 15 about here]

Within table 16, we document the results of a Kolmogorov-Smirnov test regarding the normality within the distribution of the model´s residuals. We do not find significant evidence for a non-normal distribution.

[Table 16 about here]

Our weighting factors are based on the distribution of taxpayers in our final sample in relation to the corresponding distribution in the German income tax statistics 2004. As the weighting factors do not account for the distribution in our overall data set, a test for sample selection based on a Heckman model does not seem to be appropriate.

7.4.3. Valuation of the time burden

In our primary estimate we use the net income per hour to monetize the time burden. In the following specification, we test for the gross income per hour as alternative estimate for the monetized time burden. Table 17 documents the regression results of our alternative specification. The outcome corresponds to our primary model.

[Table 17 about here]

Table 18 documents the variance inflation factors corresponding to the results in table 18. We do not find any evidence for multicollinearity.

[Table 18 about here]

Within table 19, we document the results of a Kolmogorov-Smirnov test regarding the normality within the distribution of the model´s residuals. Apart from model 2 (overall compliance

costs including all control variables), we find no evidence for a non-normal distribution. Taking into account the high number of observations, the limited number of variables and the low significance level of the Kolmogorov-Smirnov test, model 2 can be interpreted as at least asymptotically normally distributed.

[Table 19 about here]

Table 20 includes our estimates for the inverse Mills ratios of the Heckman sample selection model. We do not obtain any statistically significant result.

[Table 20 about here]

Tables and Figures

Table 1: Descriptive statistics on socio-economic information

Attribute	Value	N	%
ADVICE	Self-preparation	244	53.4
	Paid preparation	213	46.6
GENDER	Female	185	40.5
	Male	272	59.5
SELF-EMPLOYMENT	No	340	74.4
	Yes	117	25.6
MARITAL STATUS	Non-Married	239	52.3
	Married	215	47.0
	Other	3	0.7
TAX KNOWLEDGE	None	63	13.8
	At least moderate knowledge	394	86.2
TAXABLE INCOME	€ 0 – 20,000	69	15.1
	€ 20,001 – 40,000	199	43.5
	€ 40,001 – 60,000	94	20.6
	€ 60,001 – 80,000	66	14.4
	> € 80,000	29	6.3
AGE	≤ 25 years	16	3.5
	26 – 35 years	95	20.8
	36 – 45 years	140	30.6
	46 – 55 years	136	29.8
	> 55 years	70	15.3
CHILDREN	0	280	61.3
	1	102	22.3
	2 and more	75	16.4
EDUCATION	University degree	117	25.6
	University-entrance qualification	69	15.1
	Secondary school leaving certificate	160	35.0
	Lower secondary school leaving certificate / No graduation	111	24.3

Table 2: Descriptive statistics on compliance costs (net income)

		Time burden			Money burden		Total burden	
		Collecting receipts (hours)	Preparing tax return (hours)	Total time (hours)	Monetized time (€)	Monetary expenses (€)	Total costs (€)	Costs/ taxable income (%)
		Mean						
TOTAL		6.55	4.06	10.60	130.54	211.65	342.19	1.1
ADVICE	No	3.77	4.95	8.72	101.49	17.10	118.59	0.4
	Yes	9.72	3.04	12.75	163.82	434.52	598.34	1.9
GENDER	Female	4.92	3.52	8.44	97.09	191.37	288.47	0.8
	Male	7.65	4.42	12.07	153.29	225.44	378.74	1.3
SELF-EMPLOYMENT	No	3.83	3.36	7.19	81.94	107.50	189.44	0.6
	Yes	14.44	6.06	20.50	271.78	514.31	786.09	2.4
MARITAL STATUS	Other	6.30	4.16	10.46	134.21	185.22	319.43	1.4
	Married	6.90	3.99	10.89	128.08	243.62	371.71	0.8
TAX KNOWLEDGE	None	5.25	2.63	7.88	81.53	129.29	210.81	0.9
	At least moderate	6.75	4.28	11.04	138.38	224.82	363.20	1.1
TAXABLE INCOME	€ 0 – 20,000	3.80	2.23	6.02	38.48	143.14	181.62	2.4
	€ 20,001 – 40,000	6.83	4.39	11.22	113.02	169.65	282.68	1.0
	€ 40,001 – 60,000	4.63	2.77	7.40	89.12	142.79	231.91	0.5
	€ 60,001 – 80,000	11.22	6.80	18.01	312.71	424.20	736.91	1.1
	> € 80,000	6.75	4.03	10.78	189.47	402.34	591.81	0.5
AGE	≤ 25 years	3.17	1.34	4.52	36.36	82.50	118.86	1.4
	26 – 35 years	7.78	3.12	10.90	121.90	155.42	277.32	1.0
	36 – 45 years	4.21	4.08	8.29	102.26	181.77	284.03	1.0
	46 – 55 years	7.17	5.29	12.46	161.17	298.40	459.57	1.2
	> 55 years	9.09	3.50	12.59	160.86	208.71	369.58	1.2
EDUCATION	University degree	8.38	5.25	13.63	217.58	332.00	549.58	1.1
	University-entrance qualification	4.08	5.59	9.68	96.46	158.60	255.06	0.9
	Secondary school	5.69	2.86	8.56	93.92	198.69	292.61	1.3
	Lower secondary school	7.37	3.55	10.93	112.78	136.46	249.24	0.9
CHILDREN	0	5.73	3.93	9.66	107.85	147.42	255.28	1.1
	1	4.32	4.37	8.69	131.77	222.00	353.77	0.9
	2 and more	12.29	4.13	16.42	206.88	424.56	631.44	1.2

Table 3: Descriptive statistics on compliance costs (gross income)

		Time burden			Money burden		Total burden	
		Collecting receipts (hours)	Preparing tax return (hours)	Total time (hours)	Monetized time (€)	Monetary expenses (€)	Total costs (€)	Costs/ taxable income (%)
					Mean			
TOTAL		6.55	4.06	10.60	202.05	211.65	413.70	1.3
ADVICE	No	3.77	4.95	8.72	157.92	17.10	175.02	0.5
	Yes	9.72	3.04	12.75	252.60	434.52	687.11	2.2
GENDER	Female	4.92	3.52	8.44	150.89	191.37	342.27	1.0
	Male	7.65	4.42	12.07	236.84	225.44	462.28	1.5
SELF-EMPLOYMENT	No	3.83	3.36	7.19	127.80	107.50	235.30	0.8
	Yes	14.44	6.06	20.50	417.81	514.31	932.12	2.8
MARITAL STATUS	Other	6.30	4.16	10.46	207.25	185.22	392.47	1.6
	Married	6.90	3.99	10.89	198.77	243.62	442.39	0.9
TAX KNOWLEDGE	None	5.25	2.63	7.88	126.50	129.29	255.79	1.1
	At least moderate	6.75	4.28	11.04	214.12	224.82	438.95	1.3
TAXABLE INCOME	€ 0 – 20,000	3.80	2.23	6.02	60.43	143.14	203.57	2.7
	€ 20,001 – 40,000	6.83	4.39	11.22	177.93	169.65	347.59	1.2
	€ 40,001 – 60,000	4.63	2.77	7.40	137.82	142.79	280.61	0.6
	€ 60,001 – 80,000	11.22	6.80	18.01	476.37	424.20	900.57	1.4
	> € 80,000	6.75	4.03	10.78	288.29	402.34	690.63	0.6
AGE	≤ 25 years	3.17	1.34	4.52	57.88	82.50	140.38	1.6
	26 – 35 years	7.78	3.12	10.90	191.01	155.42	346.43	1.2
	36 – 45 years	4.21	4.08	8.29	159.06	181.77	340.83	1.1
	46 – 55 years	7.17	5.29	12.46	248.06	298.40	546.46	1.4
	> 55 years	9.09	3.50	12.59	246.54	208.71	455.26	1.5
EDUCATION	University degree	8.38	5.25	13.63	332.39	332.00	664.39	1.3
	University-entrance qualification	4.08	5.59	9.68	150.72	158.60	309.32	1.1
	Secondary school	5.69	2.86	8.56	146.58	198.69	345.27	1.5
	Lower secondary school	7.37	3.55	10.93	176.51	136.46	312.97	1.1
CHILDREN	0	5.73	3.93	9.66	167.48	147.42	314.91	1.3
	1	4.32	4.37	8.69	202.51	222.00	424.51	1.1
	2 and more	12.29	4.13	16.42	320.48	424.56	745.04	1.5

Table 4: Regression results

Model	1	2	3	4	5	6
R^2	0.271	0.515	0.271	0.301	0.150	0.461
Cases	456	456	458	458	308	308
Constant	-3.446***	-2.420***	-5.479***	-5.534***	0.515	-1.084
	(1.324)	(1.039)	(1.180)	(1.172)	(1.748)	(1.491)
TAXABLE INCOME	0.647***	0.627***	0.857***	0.840***	0.214	0.351***
	(0.108)	(0.087)	(0.102)	(0.102)	(0.144)	(0.119)
AGE	0.349	0.299	0.148	0.190	0.429	0.099
	(0.236)	(0.190)	(0.242)	(0.238)	(0.331)	(0.258)
SELF-EMPLOYMENT	0.936***	0.603***	0.527***	0.700***	1.091***	0.569***
	(0.145)	(0.120)	(0.151)	(0.149)	(0.194)	(0.166)
JOINT ASSESSMENT	-0.065	-0.266**	-0.400***	-0.331**	0.055	-0.160
	(0.138)	(0.114)	(0.141)	(0.141)	(0.188)	(0.147)
UNIVERSITY DEGREE	0.186	0.273**	0.290**	0.255*	-0.232	-0.156
	(0.133)	(0.112)	(0.140)	(0.138)	(0.215)	(0.172)
WOMAN	-0.057	-0.182*	-0.386***	-0.323***	0.022	-0.133
	(0.115)	(0.096)	(0.117)	(0.116)	(0.165)	(0.135)
CHILDREN	0.114	0.061	-0.044	-0.021	0.097	0.009
	(0.129)	(0.102)	(0.126)	(0.126)	(0.182)	(0.140)
TAX KNOWLEDGE	-	0.350**	-	0.234	-	0.460***
	-	(0.144)	-	(0.172)	-	(0.156)
ADVICE	-	0.362***	-	-0.468***	-	1.934***
	-	(0.023)	-	(0.118)	-	(0.149)

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 5: Compliance costs per taxable income

Survey group	Self-Employment			Other employment		
Taxable income	Net income	Gross income	Cases	Net income	Gross income	Cases
€ 0 – 22,000	2.96 %	3.38 %	32	1.14 %	1.33 %	53
€ 22,001 – 42,000	2.60 %	3.15 %	28	0.46 %	0.60 %	156
€ 42,001 – 62,000	1.80 %	2.21 %	28	0.42 %	0.52 %	77
> € 62,000	1.04 %	1.19 %	29	0.40 %	0.51 %	54

Table 6: International estimates (mean values)

Study	Country	Tax year	Time burden	Costs per tax revenue
Slemrod and Sorum (1984)	USA	1982	21.7	5.0-7.0 %
Sandford et al. (1989)	UK	1983-84	3.6	3.6 %
Vaillancourt (1989)	Canada	1986	5.5	2.5 %
Pope and Fayle (1990)	Australia	1986-87	10.7	7.9-10.8 %
Blumenthal and Slemrod (1992)	USA	1989	27.4	--
Allers (1994)	Netherlands	1990	4.5	1.4-32.0 %
Diaz and Delgado (1995)	Spain	1990	6.8	3.3 %
Malmer (1995)	Sweden	1993	2.5	1.7 %
Slemrod (1996)	USA	1995	--	8.5 %
Tran-Nam et al. (2000)	Australia	1994-95	--	4.0-5.6 %
Delgado Lobo et al. (2001)	Spain	1998	3.6	1.8 %
Delgado Lobo et al. (2001)	Spain	1999	2.2	1.2 %

Guyton et al. (2003)	USA	2000	25.5	8.3 %	
Blažić (2004)	Croatia	2001	1.7	0.9 %	
Klun (2004)	Slovenia	2000	1.7	2.5 %	
Blaufus et al. (2011)	Germany	2007	5.7	3.2-3.7 %	

Estimates on the individual income tax revenue in the U.S. refer partially to Council of Economic Advisers (2001).

Table 7: Variance inflations factors

Model	1	2	3	4	5	6
TAXABLE INCOME	1.58	1.59	1.59	1.60	1.62	1.65
AGE	1.13	1.13	1.13	1.14	1.09	1.10
SELF-EMPLOYMENT	1.08	1.13	1.07	1.18	1.07	1.16
JOINT ASSESSMENT	1.44	1.46	1.45	1.47	1.50	1.52
UNIVERSITY DEGREE	1.12	1.13	1.12	1.12	1.11	1.12
WOMAN	1.03	1.04	1.04	1.05	1.04	1.05
CHILDREN	1.12	1.12	1.11	1.12	1.13	1.13
TAX KNOWLEDGE	-	1.04	-	1.04	-	1.03
ADVICE	-	1.11	-	1.18	-	1.14

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 8: Normality of the residuals

Model	1	2	3	4	5	6
Kolmogorov-Smirnov Z	0.623	1.162	1.052	0.925	1.149	0.631
Significance level	0.833	0.134	0.219	0.359	0.143	0.820

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 9: Heckman selection results

Model	1	2	3	4	5	6
Inverse Mills ratio	3.065	3.063	1.919	2.682	5.123	4.713
Standard deviation	2.635	2.420	1.606	2.060	6.899	6.301
Significance level	0.245	0.205	0.232	0.193	0.458	0.455

All models are based on 995 observations. Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 10: Regression results: Linearity

Model	1	2	3	4	5	6
R^2	0.275	0.524	0.270	0.303	0.157	0.462
Cases	456	456	458	458	308	308
Constant	4.671***	4.507***	3.946***	3.774***	4.139***	2.935***
	(0.187)	(0.241)	(0.192)	(0.262)	(0.270)	(0.243)
TAXABLE INCOME						
€ 0 – 20,000	-0.968***	-0.857***	-1.300***	-1.254***	-0.216	-0.461*
	(0.242)	(0.193)	(0.222)	(0.222)	(0.314)	(0.248)
€ 20,001 – 40,000	-0.288*	-0.142	-0.168	-0.143	0.113	-0.091
	(0.150)	(0.125)	(0.165)	(0.161)	(0.212)	(0.158)
€ 60,001 – 80,000	0.540***	0.576***	0.629***	0.694***	0.309	0.326*
	(0.169)	(0.143)	(0.212)	(0.206)	(0.244)	(0.188)
> € 80,000	0.514**	0.549***	0.690**	0.632**	-0.049	0.175
	(0.243)	(0.212)	(0.294)	(0.284)	(0.419)	(0.332)
AGE						
≤ 25 years	-0.309	-0.272	0.110	0.139	-0.146	-0.208
	(0.369)	(0.251)	(0.261)	(0.268)	(0.435)	(0.428)
25 – 35 years	-0.082	-0.086	-0.044	-0.025	-0.069	-0.048
	(0.166)	(0.137)	(0.165)	(0.164)	(0.239)	(0.179)
45 – 55 years	0.091	0.130	0.213	0.217	0.164	0.054
	(0.144)	(0.122)	(0.150)	(0.145)	(0.205)	(0.166)
> 55 years	0.242	0.159	0.218	0.287	0.335	0.020
	(0.179)	(0.154)	(0.191)	(0.189)	(0.247)	(0.183)
SELF-EMPLOYMENT	0.865***	0.551***	0.471***	0.641***	1.039***	0.518***
	(0.151)	(0.121)	(0.153)	(0.152)	(0.200)	(0.170)
JOINT ASSESSMENT	-0.017	-0.190*	-0.266*	-0.187	0.161	-0.104
	(0.137)	(0.115)	(0.149)	(0.147)	(0.191)	(0.149)
UNIVERSITY DEGREE	0.189	0.257**	0.325**	0.290**	-0.182	-0.132
	(0.133)	(0.114)	(0.146)	(0.142)	(0.218)	(0.171)
WOMAN	-0.084	-0.229**	-0.416***	-0.347***	-0.012	-0.165
	(0.115)	(0.097)	(0.115)	(0.115)	(0.170)	(0.138)
CHILDREN (DUMMY)	0.187	0.112	0.021	0.051	0.189	0.075
	(0.122)	(0.102)	(0.127)	(0.123)	(0.188)	(0.142)
TAX KNOWLEDGE	-	0.410***	-	0.293*	-	0.485***
	-	(0.150)	-	(0.175)	-	(0.161)
ADVICE	-	-	-	-0.489***	-	1.926***
	-	-	-	(0.120)	-	(0.154)
OUTSOURCING						
No Outsourcing	-	-1.018***	-	-	-	-
	-	(0.165)	-	-	-	-
0.1 – 20.0 %	-	0.058	-	-	-	-
	-	(0.215)	-	-	-	-
40.1 – 60.0 %	-	0.467**	-	-	-	-
	-	(0.212)	-	-	-	-
60.1 – 80.0 %	-	0.415**	-	-	-	-
	-	(0.202)	-	-	-	-
80.1 – 100.0 %	-	0.691***	-	-	-	-
	-	(0.178)	-	-	-	-

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1, 2: analysis of the sum of monetary expenses and monetized

time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 11: Variance inflation factors: Linearity

Model	1	2	3	4	5	6
<u>TAXABLE INCOME</u>						
€ 0 – 20,000	1.91	1.98	1.91	1.92	1.86	1.90
€ 20,001 – 40,000	2.13	2.18	2.13	2.14	2.06	2.09
€ 60,001 – 80,000	1.57	1.60	1.58	1.60	1.64	1.66
> € 80,000	1.32	1.36	1.33	1.34	1.40	1.40
<u>AGE</u>						
≤ 25 years	1.20	1.23	1.20	1.20	1.17	1.18
25 – 35 years	1.45	1.46	1.45	1.45	1.46	1.46
45 – 55 years	1.42	1.43	1.42	1.42	1.48	1.48
> 55 years	1.38	1.40	1.38	1.39	1.44	1.46
SELF-EMPLOYMENT	1.13	1.20	1.13	1.24	1.12	1.22
JOINT ASSESSMENT	1.51	1.54	1.51	1.54	1.56	1.59
UNIVERSITY DEGREE	1.18	1.21	1.18	1.19	1.19	1.19
WOMAN	1.05	1.08	1.05	1.07	1.05	1.06
CHILDREN (DUMMY)	1.19	1.20	1.19	1.19	1.28	1.28
TAX KNOWLEDGE	-	1.07	-	1.05	-	1.05
ADVICE	-	-	-	1.19	-	1.16
<u>OUTSOURCING</u>						
No Outsourcing	-	3.51	-	-	-	-
0.1 – 20.0 %	-	1.95	-	-	-	-
40.1 – 60.0 %	-	2.17	-	-	-	-
60.1 – 80.0 %	-	2.14	-	-	-	-
80.1 – 100.0 %	-	3.36	-	-	-	-

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 12: Normality of the residuals: Linearity

Model	1	2	3	4	5	6
Kolmogorov-Smirnov Z	0.631	1.180	0.931	0.774	0.972	0.616
Significance level	0.820	0.123	0.351	0.586	0.301	0.843

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 13: Heckman selection results: Linearity

Model	1	2	3	4	5	6
Inverse Mills ratio	1.108	2.129	0.265	0.985	-0.147	0.080
Standard deviation	2.105	2.086	2.074	1.688	3.708	2.791
Significance level	0.598	0.307	0.898	0.559	0.968	0.977

All models are based on 995 observations. Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 14: Regression results: Weighting

Model	1	2	3	4	5	6
R^2	0.232	0.530	0.330	0.369	0.102	0.458
Cases	456	456	456	456	301	301
Constant	-2.302	-1.315	-5.053***	-4.867***	3.366	1.473
	(1.723)	(1.160)	(1.097)	(1.080)	(2.196)	(1.715)
TAXABLE INCOME	0.559***	0.583***	0.833***	0.818***	0.189	0.343**
	(0.122)	(0.096)	(0.111)	(0.105)	(0.173)	(0.137)
AGE	0.274	0.216	0.137	0.187	-0.304	-0.464
	(0.326)	(0.236)	(0.263)	(0.254)	(0.474)	(0.364)
SELF-EMPLOYMENT	0.913***	0.521***	0.430**	0.636***	1.087***	0.507**
	(0.203)	(0.159)	(0.171)	(0.177)	(0.256)	(0.198)
JOINT ASSESSMENT	0.004	-0.158	-0.275**	-0.214	0.206	0.020
	(0.195)	(0.143)	(0.130)	(0.137)	(0.243)	(0.192)
UNIVERSITY DEGREE	0.217	0.275**	0.200	0.196	-0.316	-0.243
	(0.206)	(0.139)	(0.126)	(0.125)	(0.301)	(0.227)
WOMAN	-0.228	-0.295**	-0.443***	-0.386***	-0.121	-0.332*
	(0.161)	(0.127)	(0.143)	(0.135)	(0.210)	(0.170)
CHILDREN	0.072	-0.052	-0.273*	-0.218	0.206	0.007
	(0.193)	(0.133)	(0.153)	(0.154)	(0.223)	(0.158)
TAX KNOWLEDGE	-	0.061	-	-0.106	-	0.113
	-	(0.201)	-	(0.208)	-	(0.251)
ADVICE	-	0.382***	-	-0.602***	-	1.907***
	-	(0.029)	-	(0.138)	-	(0.199)

Dependent variable: logarithm of compliance costs. Standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 15: Variance inflation factors: Weighting

Model	1	2	3	4	5	6
TAXABLE INCOME	1.67	1.72	1.67	1.73	1.84	1.93
AGE	1.16	1.16	1.16	1.17	1.11	1.11
SELF-EMPLOYMENT	1.05	1.07	1.05	1.10	1.04	1.10
JOINT ASSESSMENT	1.45	1.46	1.45	1.46	1.64	1.65
UNIVERSITY DEGREE	1.13	1.14	1.13	1.14	1.16	1.16
WOMAN	1.05	1.06	1.05	1.07	1.08	1.09
CHILDREN	1.10	1.11	1.10	1.11	1.10	1.11
TAX KNOWLEDGE	-	1.07	-	1.06	-	1.07
ADVICE	-	1.07	-	1.10	-	1.10

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 16: Normality of the residuals: Weighting

Model	1	2	3	4	5	6
Kolmogorov-Smirnov Z	0.713	1.022	1.032	1.116	0.840	0.589
Significance level	0.689	0.247	0.237	0.166	0.480	0.879

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 17: Regression results: Time valuation

Model	1	2	3	4	5	6
R^2	0.286	0.455	0.265	0.295	0.150	0.461
Cases	456	456	458	458	308	308
Constant	-3.127**	-2.354**	-4.870***	-4.926***	0.515	-1.084
	(1.230)	(1.037)	(1.178)	(1.170)	(1.748)	(1.491)
TAXABLE INCOME	0.660***	0.650***	0.845***	0.828***	0.214	0.351***
	(0.101)	(0.087)	(0.102)	(0.102)	(0.144)	(0.119)
AGE	0.316	0.264	0.139	0.181	0.429	0.099
	(0.220)	(0.191)	(0.242)	(0.238)	(0.331)	(0.258)
SELF-EMPLOYMENT	0.852***	0.592***	0.515***	0.689***	1.091***	0.569***
	(0.138)	(0.120)	(0.151)	(0.149)	(0.194)	(0.166)
JOINT ASSESSMENT	-0.117	-0.278**	-0.392***	-0.323**	0.055	-0.160
	(0.130)	(0.114)	(0.141)	(0.141)	(0.188)	(0.147)
UNIVERSITY DEGREE	0.214*	0.287**	0.281**	0.246*	-0.232	-0.156
	(0.124)	(0.112)	(0.140)	(0.137)	(0.215)	(0.172)
WOMAN	-0.092	-0.193**	-0.380***	-0.317***	0.022	-0.133
	(0.107)	(0.096)	(0.116)	(0.116)	(0.165)	(0.135)
CHILDREN	0.096	0.051	-0.046	-0.022	0.097	0.009
	(0.120)	(0.102)	(0.126)	(0.126)	(0.182)	(0.140)
TAX KNOWLEDGE	-	0.349**	-	0.235	-	0.460***
	-	(0.144)	-	(0.171)	-	(0.156)
ADVICE	-	0.290***	-	-0.470***	-	1.934***
	-	(0.024)	-	(0.118)	-	(0.149)

Dependent variable: logarithm of compliance costs. Standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 18: Variance inflation factors: Time valuation

Model	1	2	3	4	5	6
TAXABLE INCOME	1.58	1.59	1.59	1.60	1.62	1.65
AGE	1.13	1.13	1.13	1.14	1.09	1.10
SELF-EMPLOYMENT	1.08	1.13	1.07	1.18	1.07	1.16
JOINT ASSESSMENT	1.44	1.46	1.45	1.47	1.50	1.52
UNIVERSITY DEGREE	1.12	1.13	1.12	1.12	1.11	1.12
WOMAN	1.03	1.05	1.04	1.05	1.04	1.05
CHILDREN	1.12	1.12	1.11	1.12	1.13	1.13
TAX KNOWLEDGE	-	1.04	-	1.04	-	1.03
ADVICE	-	1.11	-	1.18	-	1.14

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 19: Normality of the residuals: Time valuation

Model	1	2	3	4	5	6
Kolmogorov-Smirnov Z	0.808	1.299	1.015	1.052	1.149	0.631
Significance level	0.531	0.068	0.254	0.219	0.143	0.820

Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

Table 20: Heckman selection results: Time valuation

Model	1	2	3	4	5	6
Inverse Mills ratio	2.794	2.847	1.772	2.561	5.123	4.713
Standard deviation	2.402	2.249	1.552	1.967	6.899	6.301
Significance level	0.245	0.206	0.254	0.193	0.458	0.455

All models are based on 995 observations. Models 1, 2: analysis of the sum of monetary expenses and monetized time burden; Models 3, 4: analysis of monetized time burden; Models 5, 6: analysis of monetary expenses.

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