

Eichfelder, Sebastian; Kegels, Chantal

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SCHUMPETER DISCUSSION PAPERS

Compliance costs caused by agency action? Empirical evidence and implications for tax compliance

**Sebastian Eichfelder
Chantal Kegels**

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For editorial correspondence please contact
SSBEditor@wiwi.uni-wuppertal.de

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Compliance costs caused by agency action?

Empirical evidence and implications for tax compliance

Sebastian Eichfelder and Chantal Kegels[♦]

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Abstract - The compliance costs of private taxpayers are not only affected by the tax law itself but also by its implementation through the tax authorities. In this paper we analyze the effect of the tax authorities on the burden of complying with tax regulations. Using survey data of Belgian businesses and controlling for potential endogeneity, we find empirical evidence that tax authority behavior is an important cost driver. According to our estimate, a customer-unfriendly tax administration increases the average compliance costs by about 25 %. Our outcome has interesting implications for tax compliance research. First of all, taxpayer services do not only affect “soft” factors like fairness and trust, but also “hard” aspects like costs. Furthermore, there may be an inherent ability of the administration to “punish” non-cooperative businesses by increased cost-burdens.

Keywords – Tax compliance costs, Red tape, Tax administration, Tax compliance, Tax evasion, Tax authority behavior

JEL Classification – H26, H 25, H 83

PsycINFO Classification – 2200, 2900, 4200

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- [♦] Contact author: Sebastian Eichfelder University of Wuppertal - Schumpeter School of Business and Economics, Gaußstr. 20, 42119 Wuppertal, Tel.: +49-202-439-2309, mail: eichfelder@wiwi.uni-wuppertal.de.
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1. Introduction

Within the economic literature, there is an extensive and still ongoing debate to which extent tax evasion is affected by “hard facts” like fines, detection probabilities, tax rates and costs and “soft facts” like tax morale, social norms, perceived fairness and trust (Cullis and Lewis 1997, Blumenthal et al. 2001, Slemrod et al. 2001, Hasseldine et al. 2007, Torgler and Schneider 2009, Alm et al. 2010, van Dijke and Verboon 2010, Fellenner et al. 2011).

Initially, economic research in the tradition of Allingham and Sandmo (1972) concentrated on the “hard fact” side based on models of rational agents. However, it soon turned out that this approach was not sufficient to explain the relatively high compliance rates compared to the low detection probabilities (for a review see Cullis and Lewis 1997, Andreoni et al. 1998, Sandmo 2005). As a result, there was an increasing interest in “soft” aspects that have nowadays found their path into the modelling of economic agents (see for example Hokamp and Pickhardt 2010 and Prinz 2010).

An approach to consider both aspects is the “slippery slope” framework (Kirchler et al. 2008 and Kirchler and Mühlbacher 2010) accounting for “enforced compliance” and “voluntary compliance”. According to this framework, “enforced compliance” is mainly affected by the power of the authorities and “voluntary compliance” by the trust in authorities. While a number of studies provide evidence for these hypotheses (Fischer and Schneider 2009, Wahl et al. 2010, Mühlbacher et al. 2011), it remains still an unsolved question of research, which factors in detail affect both dimensions of tax compliance and what is the relationship among them.

In a recent experiment, Alm et al. (2010) find evidence that the provision of taxpayer services has a negative impact on the degree of tax evasion. From the viewpoint of the “slippery slope” framework, this could be a result from an increased trust in authorities with a positive impact on “voluntary compliance” (Worsham 1996, Kirchler et al. 2008, Wahl et al. 2010).

On the other hand, it may be argued as well that supporting private taxpayers by taxpayer services reduces their bureaucratic effort resulting from taxation (Alm et al. 2010). While the impact of tax complexity and ambiguity on the compliance level may

be either positive or negative (Alm et al. 1992, Worsham 1996, Krause 2000, Alm et al. 2010), there is some evidence that compliance burdens increase the taxpayers' willingness to evade (Erard and Ho 2003). From this perspective, a "customer-oriented" agency could support taxpayers in filing their returns to reduce compliance burdens and to combat tax evasion. Thus, it seems to be an interesting question of research if there is a sufficiently strong impact of tax authority behavior on the compliance costs of private taxpayers.

In spite of a considerable number of studies measuring the burden of bureaucratic tax obligations (for a review see Allers 1994, Evans 2003, Vaillancourt and Clemens 2008), there is still a lack of empirical evidence regarding the impact of authority behavior. Apart from a preliminary analysis of Eichfelder et al. (2011) not controlling for a potential endogeneity, we are not aware of any study in this field. Therefore, it is the target of our paper to confirm and to quantify the causal effect of tax authority behavior on the burden of red tape.

As data source, we rely on a survey provided by the Federal Planning Bureau in Brussels. The file includes estimates on bureaucratic effort on a firm-level basis as well as ratings on tax authority behavior. To overcome the simultaneity between both self-reported parameters, we define proxy variables relying on the variation of different rating categories. The paper is organized as follows. Section 2 presents the data base. Section 3 documents the estimation strategy and the results that will be discussed by section 4. Section 5 concludes the paper. The appendices A and B contain an extract of the survey questionnaire and additional regression results.

2. Data

Our investigation is built on a survey of Belgian businesses that has been collected by the Federal Planning Bureau in Brussels on behalf of the Belgian government to obtain consistent estimates on the aggregate tax compliance burden. The data contains costs resulting from compliance with Belgian business taxes as well as statements on administrative quality.¹ It consists of four cross-sections in 2000, 2002, 2004 and 2006 representing the Belgian population in terms of business size, legal form and industry.

¹ Employment taxes and social insurance contributions are not included. They are part of additional

It has to be noted that the data is not a panel, as most of the firms participate in only one year. For each year, there are two sub-samples (enterprises in form of a corporation and independent self-employed taxpayers). An overview of the most important research questions is presented in appendix A. The sample sizes and response rates are reported in table 1 (for further information see De Vil and Kegels 2002, Joos and Kegels 2004, Janssen et al. 2006, Kegels 2008). Altogether, the data includes 1,590 observations.

Table 1: Survey information

Survey Group	Self-employed		Enterprises	
	Sample size	Response rate	Sample size	Response rate
2000	4,256	7.5 %	2,658	15.3 %
2002	3,789	16.6 %	2,511	23.3 %
2004	3,286	12.3 %	2,683	19.4 %
2006	4,324	10.4 %	2,719	17.0 %

To our knowledge the described dataset is the best data source concerning the tax compliance costs of Belgian businesses. Nevertheless, some measurement issues should be taken into account. The survey response is lower than in a number of previous studies (for a review see Evans 2003 and Vaillancourt and Clemens 2008), but not unusual compared to other business surveys (OECD 2001, Eichfelder and Schorn 2009). The effect of a possible non-response bias on cost estimates is not obvious, as there are theoretical and empirical arguments for an overestimation as well as an underestimation.²

The approach of cost measurement corresponds to previous research (OECD 2001, European Communities 2004). Cost estimates are based on personal statements of the requested businesses. The questionnaire considers the time effort (including the time burden of managers and directors) as well as expenses for external support and information material. The hourly cost of the time burden is self-assessed by the survey respondents. This could imply a higher or a lower cost estimate compared to alternative methods of time measurement (e.g. GDP per hour or average wages, see Allers 1994, Evans 2003).

The questions on different cost categories and activities (bookkeeping, tax planning, filing the tax return) are not as detailed as in a number of previous studies (Tran-Nam et

statistical material of the Federal Planning Bureau.

² Pressure on political authorities may be an incentive for taxpayers with high compliance costs to participate. Nonetheless, these taxpayers may also be reluctant to take part, because they do not want to waste their time. Empirical evidence is mixed (Allers 1994, Rametse and Pope 2002).

al. 2000, DeLuca et al. 2007). As empirical research suggests that the number of cost categories and activities in the survey instrument is positively associated with the obtained cost estimate,³ this could result in an underestimation of the compliance burden. In addition, not all cost elements are considered over the whole period.⁴

The wording of the questions is generally unchanged over the whole period with one exception. Compliance costs are derived on a monthly basis from 2000 to 2004 and on a yearly basis in 2006 (see appendix A). These differences could result in a framing effect biasing the cost estimate (for problems of cost-measurement see Sandford 1995). Taking into account the aforementioned evidence that allocating costs to a number of categories increases the cost estimate (Footnote 3), compliance costs derived on a monthly basis should be higher. However, as we refer to a cross-sectional analysis, this should not interfere our investigation.

Concluding, there are some aspects of cost measurement that could result in an upward or downward bias of the estimated compliance burden. This problem is well-known in studies measuring tax compliance costs (Sandford 1995, Evans 2003, Vaillancourt and Clemens 2008). Taking into account that our analysis essentially requires a good proxy for the compliance burden and that the Belgian cost estimates are similar to international evidence (OECD 2001, European Communities 2004), our data base should be appropriate. Nevertheless, we excluded cases with unusually low or high estimates as outliers to account for a potential cost perception bias.⁵

Table 2 summarizes the compliance costs per business (outliers excluded) in real terms (in €).⁶ We report the mean, the median, the standard deviation and the case number. As business classes, we refer to self-employed taxpayers as well as small, medium and big enterprises. According to the size criteria of the European Union,⁷ we define enterprises

³ Klein-Blenkers (1980, p. 140) asked German enterprises for the sum of overall compliance costs and for the sum of itemized cost elements. According to his findings, the sum of overall compliance costs was considerably lower (by about 50 %). Similar results are reported by Rametse and Pope (2002) and Chittenden et al. (2005).

⁴ That holds for expenses for hardware and software that are only considered in 2000 and 2002. To obtain a consistent cost definition, we do not consider these cost elements.

⁵ As outlier criterion, we use the results of a regression of compliance costs on business size, year and survey sample (self-employed versus enterprises). Cases are defined as outliers if the residual of the regression exceeds its doubled standard deviation. 60 cases are identified as outliers.

⁶ For the correction of price effects, we use the inflation index of the Belgian Statistical Office (http://statbel.fgov.be/en/statistics/figures/economy/consumer_price_index/inflation/).

⁷ See the recommendation of the European Communities K (2003) 1422 from the 6th of May 2003.

with a turnover of less than 10 Mio. € (between 10 and 50 Mio. €) as small (medium). We consider exclusively cases, where the turnover is available.

Table 2: Compliance costs per business (in €)

Business class	Mean	Median	Standard deviation	Case number
Self-employed	4,318	2,520	6,257	480
Small enterprises	20,035	9,907	29,740	292
Medium enterprises	44,305	25,138	55,448	120
Big enterprises	138,015	58,479	205,212	126

As table 2 demonstrates, compliance costs increase in firm size. The vast majority of businesses are sole proprietorships (about 49 %) and small enterprises (about 29 %). Relative cost burdens per turnover are presented in table 3.⁸

Table 3: Compliance costs per turnover (in %)

Business class	Mean	Median	Standard deviation	Case number
Self-employed	12.47	4.44	21.07	480
Small enterprises	3.34	0.80	11.87	292
Medium enterprises	0.22	0.13	0.26	120
Big enterprises	0.07	0.03	0.12	126

In line with the literature (OECD 2001, Evans 2003, DeLuca et al. 2007), the costs per turnover are significantly higher for the smaller businesses. The mean (median) compliance costs of self-employed taxpayers amount to about 12.5 % (4.4 %) of the turnover, while the corresponding values of big businesses are only about 0.07 % (0.03 %). Thus, the burden lies especially on the self-employed taxpayers and small businesses.

Apart from information on the bureaucratic effort, the data contains subjective assessments of the administrative and legislative quality of the tax system. Answers are coded on a 5-point Likert scale. The data includes seven statements in each case that are documented in appendix A. Regarding tax administration these include

- the complexity to find the right agency (AGENCY),
- potential problems to contact the right agency (CONTACT),
- the precision of answers obtained from the administration (ANSWER),
- the clear motivation of administrative decisions (MOTIVATION),

⁸ Within our data set, there is a limited number of businesses (mainly start ups) with very low turnovers (minimum value is 10 €). As the fraction of compliance costs to turnover converges to infinity for a turnover of zero, these values would bias our mean compliance costs per turnover. Furthermore, a fraction of compliance costs to turnover of more than 100 % would be unrealistic in the long run, as it implies enduring losses of a business. Therefore, we calculate the mean in table 3 by using a maximum value of 100 %. Cost estimates of 15 businesses are affected by this procedure.

- possible delays of administrative answers (DELAY),
- contradictions between answers of staff members (CONTRADICTION) and
- the correspondence of the obtained information to the businesses' needs (INFORMATION).

Table 4 contains the absolute and the relative (in parentheses) distribution of answers. 1 is a positive and 5 is a negative rating. Businesses without a specific opinion are considered by a value of 3.

Table 4: Ratings for tax administration

Variable	1	2	3	4	5	Total
AGENCY	108 (6.99 %)	581 (37.58 %)	95 (6.14 %)	487 (31.50 %)	275 (17.79 %)	1,546
CONTACT	89 (5.79 %)	535 (34.81 %)	109 (7.09 %)	517 (33.64 %)	287 (18.67 %)	1,537
ANSWER	72 (4.67 %)	629 (40.79 %)	144 (9.34 %)	487 (31.58 %)	210 (13.62 %)	1,542
MOTIVATION	61 (3.96 %)	514 (33.40 %)	192 (12.48 %)	563 (36.58 %)	209 (13.58 %)	1,539
DELAY	96 (6.25 %)	709 (46.13 %)	173 (11.26 %)	356 (23.16 %)	203 (13.21 %)	1,537
CONTRADICTION	49 (3.20 %)	416 (27.17 %)	351 (22.93 %)	491 (32.07 %)	224 (14.63 %)	1,531
INFORMATION	59 (3.84 %)	725 (47.20 %)	194 (12.63 %)	426 (27.73 %)	132 (8.59 %)	1,536

We find a considerable variance in the distribution. For example, only a minority of the requested businesses did give a positive rating regarding CONTRADICTION, MOTIVATION and CONTACT, while more than 50 % confirmed that they obtained an answer without an unexpected delay (DELAY) and that the obtained information conformed to their needs (INFORMATION). The data further includes seven statements on legislative quality. These include

- information on new regulations in advance (ADVANCE),
- the understandability of the tax law (UNDERSTANDABILITY),
- the clearness of corresponding objectives (OBJECTIVE),
- the regulations' adaption to business situations (ADAPTION),
- the sufficiency of time to conform with new regulations (TIME),
- the coherency of regulations to each other (COHERENCY),
- the information content of regulations (ENTROPY).

The absolute and relative (in parentheses) frequencies are presented in table 5.

Table 5: Ratings for tax legislation

Variable	1	2	3	4	5	Total
ADVANCE	133 (8.74 %)	447 (29.37 %)	191 (12.55 %)	422 (27.73 %)	329 (21.62 %)	1,522
UNDERSTANDABILITY	39 (2.54 %)	328 (21.33 %)	87 (5.66 %)	639 (41.55 %)	445 (28.93 %)	1,538
OBJECTIVE	73 (4.79 %)	428 (28.07 %)	130 (8.52 %)	597 (37.97 %)	315 (20.66 %)	1,525
ADAPTION	35 (2.30 %)	299 (19.61 %)	184 (12.07 %)	612 (40.13 %)	395 (25.90 %)	1,525
TIME	112 (7.28 %)	604 (39.25 %)	115 (7.47 %)	432 (28.07 %)	276 (17.93 %)	1,539
COHERENCY	42 (2.74 %)	307 (20.03 %)	244 (15.92 %)	587 (38.29 %)	353 (23.03 %)	1,533
ENTROPY	45 (2.93 %)	417 (27.18 %)	153 (9.97 %)	589 (38.40 %)	330 (21.51 %)	1,534

On average, statements on tax legislation are clearly less positive than statements on tax administration. Only for TIME, we find a majority of positive answers, while about 66 % of the businesses are convinced that tax regulations are not sufficiently adapted to business situations (ADAPTION). Also regarding the UNDERSTANDABILITY, the COHERENCY, the information content (ENTROPY) and the OBJECTIVE of tax regulations, we find a majority of negative statements.

In addition, our data includes information on business size (turnover, number of employees), industry and region. For a number of years, there is also data regarding business age, the number of establishments in Belgium, the use of different information technology tools for tax purposes and proposals to simplify the overall tax system.⁹ As we consider the whole survey period, we do not include these additional variables in our investigation.

3. Empirical investigation

3.1. Preliminary analysis

It has already been argued that a “customer-oriented” tax administration should reduce the compliance burden by providing advice and taxpayer services. By contrast, a “control-oriented” tax authority may increase a businesses’ effort by audits, requests for additional information material, unhelpful answers or delays. Therefore, we expect a positive correlation between ratings on tax administration and compliance costs. While businesses with a negative rating (5) should face a higher cost burden, a positive rating (1) should imply a cost reduction. The same holds for ratings on tax legislation.

⁹ Business age is available for 2000 and 2002. The same holds for the legal form and the number of establishments in case of an enterprises survey. The questionnaires of 2004 and 2006 contain statements on proposals to simplify the tax law. The use of different information technology tools is questioned in 2004 and in another form in 2006.

However, simply analyzing the correlation between tax compliance costs and rating information leads to a simultaneity problem. Cost estimates as well as evaluations on administrative and legislative quality are self-reported values. Thus, it may also be argued that taxpayers with a relatively high compliance burden take “revenge” by assessing bad ratings to the authorities. For that reason, the causality of a correlation between compliance costs and ratings is not straightforward. This implies endogeneity and inconsistent regression coefficients.

Typical strategies to overcome endogeneity in econometrics include the use proxy variables for the missing information and the identification of the causal relationship via an IV-estimator (Wooldridge 2010, pp. 67). The second approach requires an instrument variable being correlated with the endogenous explanatory parameter (tax authority behavior), but not with the dependent variable (tax compliance costs). Unfortunately, no convincing instrument seems to be available in our data set. Therefore, we rely on the first strategy to construct proxy variables for both causal effects.

Our estimation strategy is built on the observation that only parts of the ratings on administrative quality are significantly correlated with the burden of red tape. If the rating behavior would mainly be driven by the (dis)satisfaction with bureaucratic obligations (compliance costs drive ratings), the regression coefficients for different aspects of administrative quality should be broadly the same. This argument can be exemplified by a rating bias of undergraduate students regarding a university lecture.

In this example, rating behavior may be driven by the properties of the lecture itself (“well-organised”, “subjects were easy to understand”), but also by the affection or the dislike with regards to the responsible professor. In the latter case, we would expect a similar rating for all relevant issues. Hence, if the only important matter is the charisma of the teacher, all ratings would be largely identical (even if the lecture was not well-organised).

A similar argument holds in our case. If it is true that rating behavior is mainly driven by tax compliance obligations, we should observe a significant regression coefficient for all different administrative aspects. The same holds for ratings on legislative issues. From our perspective, there is no convincing argument that only a portion of the administrative (legislative) ratings should be driven by the compliance burden. Hence, if we

find significant effects only for a number of ratings, this can be taken as evidence for a direct effect of specific aspects of authority behavior on compliance costs (and not vice versa).

To test this relationship, we estimate linear regression models (pooled OLS) on tax compliance costs regarding for one administrative (legislative) aspect. The estimator can be described as

$$CCOST = \alpha_0 + \alpha_1 \cdot RATING + \alpha_2 \cdot \Theta + \varepsilon. \quad (1)$$

CCOST is defined as the logarithm of tax compliance costs (sum of personnel and external costs) in real terms of the year of 2000, RATING as the administrative (legislative) rating aspect in question (ranging from 1 (positive) to 5), ε the error term and Θ as a vector of the following control parameters:

TURNOVER	Logarithm of turnover deflated to the year of 2000.
SELF-EMPLOYED	The dummy variable takes a value of 1 (0) in case of a self-employed taxpayer (enterprise).
INDUSTRY	Set of dummy variables: within the enterprises surveys, we control only for industrial businesses (EINDUSTRIAL). Regarding self-employed, we control in addition to SINDUSTRIAL for the primary sector (SPRIMARY) and construction (SCONSTRUCTION). The other self-employed respondents are active in the services sector.
YEAR	Set of dummy variables: we consider dummies for 2002, 2004 and 2006 to control for time effects.
ADVICE	Variables measuring the use of external advice: we utilize the logarithm of the fraction of external costs to overall compliance costs ¹⁰ (OUTSOURCING) as well as a dummy variable for businesses without external advice (INHOUSE).

Inference statistics are based on heteroscedasticity-robust standard errors. Furthermore, we exclude cases with extraordinary high (low) compliance costs as outliers (Footnote 5). The partial effects on the relevant ratings are documented by table 6 (see appendix B for full regression results).

¹⁰ We add 0.01 to prevent undefined logarithmic values.

Table 6: Partial effects of ratings

Administrative Ratings	Coefficients (Standard Errors)	Legislative Ratings	Coefficients (Standard Errors)
AGENCY	0.030 (0.024)	ADVANCE	0.063 (0.024)
CONTACT	0.038 (0.025)	UNDERSTANDABILITY	0.115*** (0.026)
ANSWER	0.078*** (0.026)	OBJECTIVE	0.052*** (0.028)
MOTIVATION	0.073*** (0.026)	ADAPTION	0.108*** (0.028)
DELAY	0.080*** (0.025)	TIME	0.084*** (0.023)
CONTRADICTION	0.036 (0.028)	COHERENCY	0.127*** (0.027)
INFORMATION	0.130*** (0.028)	ENTROPY	0.111*** (0.025)

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. The full regression results are documented in appendix B.

As expected, we find generally a positive relationship between rating variables and price-adjusted compliance costs. Nevertheless, we also observe strong differences with regards to the size and the significance of the coefficients. That holds especially in terms of the administrative ratings, where we do not find significant correlations for problems to identify and contact the right agency (AGENCY, CONTACT) as well as for contradictions between statements of different staff members (CONTRADICTION). From a compliance cost perspective, the most relevant factors seem to be the precision and delay of answers (ANSWER, DELAY) and especially the degree by which the obtained information conforms to a businesses' needs (INFORMATION). Regarding legislation UNDERSTANDABILITY, ENTROPY (information content) and COHERENCY are the most relevant factors.

This outcome is widely confirmed if we include all administrative (legislative) ratings in one regression model (models 1 to 3 in table 7). To account for the fact that all ratings are closely connected to each other, we also utilize dummy variables in an alternative approach (models 4 to 6 in table 7). The dummy variables take a value of 1 in case of negative ratings (4 or 5). Within the extended models there is only a limited number of significant administrative (DELAY, INFORMATION) and legislative (UNDERSTANDABILITY, TIME, COHERENCY) ratings. This is not unexpected, as the rating parameters are closely connected to each other.

Table 7: Partial effects of ratings (extended model)

Model	1	2	3	4	5	6
R ²	0.663	0.665	0.669	0.664	0.665	0.668
Cases	970	970	937	970	970	937
AGENCY	-0.017 (0.030)	-	-0.035 (0.032)	-0.031 (0.073)	-	-0.062 (0.076)
CONTACT	-0.023 (0.033)	-	-0.022 (0.034)	-0.070 (0.076)	-	-0.086 (0.078)
ANSWER	-0.000 (0.035)	-	-0.021 (0.035)	0.004 (0.078)	-	-0.032 (0.079)
MOTIVATION	0.025 (0.034)	-	0.0067 (0.035)	0.026 (0.075)	-	-0.023 (0.078)
DELAY	0.048* (0.029)	-	0.044 (0.029)	0.153** (0.072)	-	0.144* (0.074)
CONTRADICTION	-0.020 (0.031)	-	-0.024 (0.032)	-0.040 (0.071)	-	-0.060 (0.073)
INFORMATION	0.123*** (0.037)	-	0.098** (0.039)	0.293*** (0.083)	-	0.229*** (0.086)
ADVANCE	-	0.016 (0.026)	0.016 (0.026)	-	0.027 (0.068)	0.013 (0.069)
UNDERSTANDABILITY	-	0.064* (0.033)	0.069** (0.035)	-	0.147* (0.078)	0.143* (0.081)
OBJECTIVE	-	-0.038 (0.032)	-0.038 (0.033)	-	-0.044 (0.075)	-0.043 (0.077)
ADAPTION	-	0.025 (0.035)	0.0076 (0.036)	-	0.044 (0.078)	0.001 (0.081)
TIME	-	0.037 (0.029)	0.040 (0.030)	-	0.124* (0.071)	0.137* (0.074)
COHERENCY	-	0.065* (0.036)	0.054 (0.037)	-	0.166** (0.080)	0.154* (0.083)
ENTROPY	-	0.034 (0.031)	0.034 (0.032)	-	0.066 (0.074)	0.067 (0.075)
TURNOVER	0.291*** (0.019)	0.279*** (0.018)	0.282*** (0.019)	0.289*** (0.019)	0.276*** (0.018)	0.279*** (0.019)
SELF-EMPLOYED	-0.306** (0.119)	-0.330*** (0.117)	-0.336*** (0.121)	-0.312*** (0.119)	-0.330*** (0.116)	-0.340*** (0.120)
2002	0.078 (0.084)	0.073 (0.083)	0.085 (0.084)	0.088 (0.084)	0.078 (0.083)	0.101 (0.084)
2004	0.102 (0.090)	0.066 (0.090)	0.100 (0.093)	0.115 (0.090)	0.055 (0.090)	0.099 (0.093)
2006	-0.461*** (0.106)	-0.446*** (0.105)	-0.413*** (0.107)	-0.443*** (0.106)	-0.453*** (0.105)	-0.405*** (0.108)
OUTSOURCING	-0.276*** (0.051)	-0.269*** (0.051)	-0.267*** (0.052)	-0.278*** (0.051)	-0.269*** (0.051)	-0.270*** (0.052)
INHOUSE	-1.738*** (0.224)	-1.720*** (0.221)	-1.703*** (0.226)	-1.737*** (0.225)	-1.725*** (0.223)	-1.710*** (0.228)
EINDUSTRIAL	0.133 (0.098)	0.144 (0.096)	0.153 (0.099)	0.137 (0.098)	0.147 (0.096)	0.161 (0.099)
SINDUSTRIAL	0.278 (0.219)	0.276 (0.230)	0.284 (0.241)	0.285 (0.220)	0.287 (0.230)	0.316 (0.238)
SCONSTRUCTION	-0.002 (0.101)	0.029 (0.100)	0.036 (0.102)	0.013 (0.101)	0.015 (0.100)	0.036 (0.101)
SPRIMARY	-0.847*** (0.102)	-0.858*** (0.101)	-0.848*** (0.103)	-0.835*** (0.101)	-0.853*** (0.102)	-0.834*** (0.103)
BRUSSELS	0.071 (0.098)	0.051 (0.098)	0.055 (0.098)	0.073 (0.097)	0.056 (0.098)	0.060 (0.099)
WALLONIE	-0.132* (0.077)	-0.171** (0.077)	-0.155* (0.080)	-0.134* (0.078)	-0.169** (0.077)	-0.149* (0.080)
Constant	4.686*** (0.308)	4.535*** (0.315)	4.447*** (0.326)	4.964*** (0.289)	4.958*** (0.286)	4.920*** (0.295)

Dependent variable: logarithm of compliance costs; robust standard errors in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1 to 3 are based on the unchanged ratings (1 positive, 5 negative), while models 4 to 6 account for dummy variables with a value of 1 for negative ratings (4, 5).

Altogether, our preliminary results provide evidence that the relationship between compliance costs and ratings is not only driven by reversed causality affecting all ratings. Nevertheless, also the partial effects of table 7 should be biased. Hence, there is a need to construct proxy variables accounting for the causal effect and the reversed causality effect.

3.2. Estimation strategy and results

In a first step, we define two different averages for ratings on tax administration. The first variable is a weighted average over the seven different administrative aspects. As weighting parameters we refer to the coefficients of model 1 in table 7.¹¹ The second variable is an unweighted average over the seven administrative ratings. While the weighted average accounts for differences in the relevance of administrative issues for tax compliance costs (especially DELAY and INFORMATION), the latter is our proxy variable for reversed causality.

As already mentioned, there is no reason to believe that the impact of compliance costs on rating behavior should be restricted to certain ratings like INFORMATION. Therefore, an unweighted average seems to be a good proxy for the reversed causality effect. As proxy for the causal relationship of interest (authority behavior on tax compliance costs), we use the ratio of the weighted average to the unweighted average. This can be justified by the following considerations.

1) It is not useful to include both averages into one model, as they are strongly correlated to each other. This is a rather technical issue that does not hold for the unweighted average and the ratio of averages. 2) The ratio is a measure for the variation of ratings. If there is no variation (the same rating on all aspects), the ratio is generally 1 and our information is restricted to the unweighted average. This can be exemplified by an example. In case of a survey respondent with a rating of 5 for all seven administrative categories, we have no information if these ratings are driven by authority behavior (causality) or compliance costs (reversed causality). However, if there would be a positive rating on INFORMATION (1) and a negative rating on all other issues (5), we can be quite sure that at least the difference between both aspects should be caused by authority behavior. This is considered by the ratio of averages.

¹¹ We increase all coefficients by 0.023 to obtain non-negative weighting parameters.

3) The ratio is also a good measure for the direction of partial effects. This can be explained with regards to the previous example. If there is a negative rating (5) on all administrative aspects apart from INFORMATION (rating of 1), we can draw the following conclusions. 3.1) The unweighted average rating is rather low implying higher compliance costs (reversed causality). 3.2) The obtained INFORMATION is appropriate. Obviously, tax authority behavior has been customer-friendly regarding this aspect. 3.3) According to our preliminary analysis in section 3.1, INFORMATION is a very important aspect with regards to compliance costs. Therefore, we expect a significant reduction of the cost burden due to this aspect (causality). This would not be the case for positive ratings on unimportant aspects like CONTACT. The expected effects of 3.3) will be generally considered by the ratio of averages. The weighted average will always be lower (higher) than the unweighted average if (and only if) important aspects (like DELAY and INFORMATION) obtain a more positive (more negative) rating than average. Thus, if there is a rating of 1 (5) for INFORMATION and of 5 (1) for all other aspects the ratio of averages will be smaller (higher) than 1 implying a reduction of (increase in) compliance costs.

Concluding, the ratio of averages is a good proxy for the causal effect, while reversed causality can be regarded by the unweighted average of ratings. To control for correlations between legislative and administrative ratings we derive the same measures – the ratio of the weighted average¹² to the unweighted average as well as the unweighted average – on ratings on tax legislation.

Table 8 documents the descriptive statistics of these identification parameters. In general, legislative ratings are more negative compared to administrative ratings. Furthermore, the ratio of administrative ratings is on average smaller than 1. This implies that cost-relevant aspects (INFORMATION and DELAY) are evaluated more positively than cost-irrelevant aspects (CONTACT and AGENCY).

¹² As weighting factor, we use the regression coefficients of model 2 in table 7, increased by 0.038 to prevent negative weighting parameters.

Table 8: Identification parameters

Size class	Mean	Median	Standard deviation	Case number
RATIO ADMINISTRATION	0.955	0.970	0.131	1,492
RATIO LEGISLATION	1.011	1.000	0.047	1,480
AVERAGE ADMINISTRATION	3.118	3.000	0.833	1,492
AVERAGE LEGISLATION	3.461	3.429	0.838	1,480

Including the identification parameters in our regression model, our hypotheses are as follows: 1) Our proxy for a causal effect of tax authority behavior (RATIO ADMINISTRATION) is positively and significantly correlated with compliance costs. 2) The same holds for our proxy regarding the causal effect of tax legislation (RATIO LEGISLATION). 3) There is a positive and significant regression coefficient of average ratings (AVERAGE ADMINISTRATION and AVERAGE LEGISLATION) accounting for the reversed causality effect of compliance costs on rating behavior. 4) There is only one reversed causality effect. Therefore, we expect only a significant outcome for one of the average variables (AVERAGE ADMINISTRATION or AVERAGE LEGISLATION).

Our regression models are similar to formula (1). In particular, we use the same estimation method (pooled OLS), identical control parameters and heteroscedasticity-robust standard errors. However, we do not only consider the logarithm of price-adjusted overall compliance costs as our dependent variable (CC), but also the logarithm of price-adjusted expenses for external support (EC) and the logarithm of price-adjusted personnel costs (PC) including payments for managers and directors. As already mentioned, estimates on compliance costs could be biased by measurement errors. However, it seems unlikely that each cost element contains the same estimated error. Using alternative proxies for the real cost burden allows us to test if our results are robust with regards to this aspect.

A problem of our causal identification parameters (RATIO ADMINISTRATION and RATIO LEGISLATION) lies in the fact that an interpretation of the estimated regression coefficients is not straightforward. Apart from their significance and sign, regression coefficients on a ratio of averages derived from Likert scales do not seem to be very meaningful. To obtain coefficients with a quantitative validity, we define in an alternative specification (models CC2 to PC2) dummy variables replacing our causal identifiers. A dummy variable takes a value of 1 if the respective ratio of a survey re-

spondent is higher than the average ratio increased by its standard deviation (see table 8). The final regression results are documented by table 9.

Table 9: Final regression results¹³

Model	CC1	EC1	PC1	CC2	EC2	PC2
R ²	0.667	0.658	0.688	0.667	0.657	0.688
Cases	937	860	925	937	860	925
RATIO ADMINISTRATION	0.682*** (0.253)	0.779*** (0.274)	0.542** (0.262)	0.218*** (0.083)	0.214** (0.091)	0.172* (0.092)
RATIO LEGISLATION	1.512** (0.686)	1.345* (0.732)	1.549** (0.729)	0.231*** (0.087)	0.200** (0.091)	0.221** (0.091)
AVERAGE ADMINISTRATION	0.037 (0.045)	0.036 (0.047)	0.034 (0.046)	0.059 (0.045)	0.059 (0.047)	0.054 (0.046)
AVERAGE LEGISLATION	0.187*** (0.047)	0.172*** (0.049)	0.196*** (0.050)	0.196*** (0.047)	0.179*** (0.049)	0.204*** (0.050)
TURNOVER	0.281*** (0.019)	0.281*** (0.020)	0.277*** (0.020)	0.281*** (0.0184)	0.281*** (0.020)	0.277*** (0.020)
SELF-EMPLOYED	-0.338*** (0.120)	-0.351*** (0.124)	-0.226* (0.130)	-0.326*** (0.119)	-0.339*** (0.123)	-0.216* (0.129)
2002	0.092 (0.083)	0.086 (0.087)	0.028 (0.084)	0.091 (0.083)	0.088 (0.087)	0.026 (0.084)
2004	0.100 (0.091)	0.112 (0.096)	0.031 (0.095)	0.101 (0.092)	0.112 (0.097)	0.030 (0.096)
2006	-0.412*** (0.104)	-0.429*** (0.110)	-0.560*** (0.110)	-0.400*** (0.104)	-0.420*** (0.110)	-0.548*** (0.109)
OUTSOURCING	-0.268*** (0.052)	0.809*** (0.052)	-0.977*** (0.059)	-0.261*** (0.052)	0.817*** (0.053)	-0.971*** (0.059)
INHOUSE	-1.712*** (0.225)	- (0.225)	-3.548*** (0.247)	-1.681*** (0.226)	- (0.226)	-3.521*** (0.248)
EINDUSTRIAL	0.151 (0.098)	0.154 (0.101)	0.180* (0.102)	0.138 (0.099)	0.142 (0.101)	0.169* (0.102)
SINDUSTRIAL	0.291 (0.237)	0.258 (0.264)	0.314* (0.186)	0.290 (0.222)	0.250 (0.245)	0.313* (0.177)
SCONSTRUCTION	0.034 (0.101)	-0.017 (0.108)	-0.012 (0.112)	0.029 (0.100)	-0.015 (0.108)	-0.018 (0.111)
SPRIMARY	-0.851*** (0.102)	-0.882*** (0.109)	-0.882*** (0.108)	-0.851*** (0.102)	-0.882*** (0.109)	-0.881*** (0.107)
BRUSSELS	0.055 (0.097)	0.072 (0.101)	0.076 (0.107)	0.039 (0.097)	0.056 (0.101)	0.060 (0.106)
WALLONIE	-0.154** (0.078)	-0.128 (0.081)	-0.111 (0.079)	-0.161** (0.078)	-0.140* (0.081)	-0.115 (0.079)
Constant	2.261*** (0.775)	2.433*** (0.828)	0.960 (0.833)	4.277*** (0.318)	4.386*** (0.334)	2.892*** (0.352)

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1 to 3 are based on the general definition of the RATIO variables. Models 4 to 6 are based on dummy variables with a value of 1 if the corresponding RATIO parameter exceeds its average value increased by the relevant standard deviation (see table 8).

¹³ To control for multicollinearity, we calculated variance inflation factors. We also conducted Kolmogorov-Smirnov tests for the normality in the distribution of the residuals. Furthermore, we tested for non-linear relationships by the RESET test (Wooldridge 2010, p. 137). We find no evidence for any bias in our estimates or inference statistics.

All hypotheses are confirmed. In particular, we obtain positive and significant regression coefficients for both causal parameters in all specifications (hypotheses 1 and 2). This can be taken as evidence that there is a causal and separate effect of tax administration and tax legislation on the compliance burden. The impact of authority behavior is stronger regarding external costs EC. Thus, taxpayers being unsatisfied with authority support seem to increase their demand for external advice. The models CC2 to PC2 allow for a quantitative estimate. We have to take into account that the estimated coefficient of a dummy variable in logarithmic models is not identical to its absolute effect on the cost burden. Correcting for this aspect, the estimated increase in compliance costs in case of a customer-unfriendly tax administration is 24.4 %.¹⁴

Regarding the AVERAGE parameters, we only obtain a significant relationship in case of AVERAGE ADMINISTRATION. This is in line with our hypotheses 3) and 4). As has been exemplified, both parameters are a measure for the reversed causality effect of compliance costs on rating behavior. We expect only one reversed causality effect affecting both ratings (LEGISLATION and ADMINISTRATION). Obviously, AVERAGE LEGISLATION seems to be a better proxy for this aspect. Therefore, AVERAGE ADMINISTRATION is not significant.¹⁵

Like previous studies (OECD 2001, DeLuca et al. 2007) we find a regressive impact of business size on compliance costs. The correlation coefficient of TURNOVER indicates that a growth by 1.00 % results in an increase in compliance costs by only about 0.28 %. We also find evidence for higher compliance costs of enterprises. This should be due to the legal form (corporation).

In terms of the survey years, we find no clear evidence for a positive or a negative cost trend. In spite of that, the estimated cost burden in 2006 is significantly smaller than in previous years. This should be driven by the different wording of the survey questionnaire in 2006 asking for compliance costs on a yearly basis. As expected, the framing effect is negative. We control for this effect by the year dummy for 2006. We also find evidence for lower compliance costs in the primary sector (regularly farmers) and in the

¹⁴ The absolute effect can be calculated as $e^{Coef} - 1$, with e defined as Eulers' constant and $Coef$ as the regression coefficient (Wooldridge 2010, p. 71).

¹⁵ We tested alternative models accounting exclusively for administrative or legislative parameters. Under these circumstances, both average parameters are positive and significant.

Wallonian part of Belgium. Furthermore, there seems to be a connection of tax-related cost burdens and the use of external resources (for this aspect see also Eichfelder and Schorn 2009).

Our results could be biased by the fact that a number of survey respondents participated more than one time. Therefore, we re-estimated the model excluding all second and third observations of one survey respondent. The outcome is documented in appendix B and confirms our original specification. In this setting, a customer-unfriendly tax administration increases the compliance burden by 26.5 %. To control for the effect of a potential non-response bias, we also tested if the inclusion of response rates as exogenous parameters affects our results. The estimated coefficient of the response rate was negative, but typically not significant. The other coefficients remained broadly unchanged. Therefore, we abstain from reporting these additional results.

4. Discussion

Our investigation provides evidence that the (lack of) customer orientation of Belgian authorities is significantly connected with compliance costs of Belgian business taxpayers. From the viewpoint of the “slippery slope” framework (Kirchler et al. 2008, Mühlbacher and Kirchler 2010) this implies a complex interrelation of “enforced compliance” and “voluntary compliance” being affected by power and trust.

On the one hand, the effect of authority behavior on compliance costs can be interpreted as an implicit power of the administration to “punish” businesses that are non-cooperative. This aspect may be especially relevant if a business does not adhere to deadlines or reporting instructions. In Germany for example, there is a considerable (and still increasing) amount of transfer pricing guidelines that are tricky to satisfy completely. If a German business seems to be aggressive in using transfer pricing for tax planning, these bureaucratic obligations may act as a good instrument to increase the relevant planning costs. Furthermore, an insufficient documentation can also be punished by penalties even if no tax is evaded (Lindenthal 2006).

On the other hand, an increase in power can also reduce the willingness to comply. If for example the tax administration decides to enhance its knowledge on tax-relevant factors by additional information requirements, this typically implicates a higher compliance burden. If not counterbalanced by a perceived increase in the detection probabil-

ity (power), higher cost burdens should typically reduce compliance. That holds especially for non-filers or “ghosts”, who have a very low detection risk (Alm et al. 2010).

Hence, it should be important if an increase in the detection probability is financed by cost of the administration (additional staff, enhanced software for better targeted audits) or by cost of private taxpayers (formal obligations, additional information requirements). It has to be noted, that higher compliance costs due to additional obligations in one field may be counterbalanced by a reduction of other information requirements or by an increase in taxpayer services that may be costly for the tax administration.

There are at least two other reasons why the distribution of bureaucratic burdens between the taxpayer side and the authority side is an important issue. First of all, it is not necessarily guaranteed that the allocation of these obligations will be cost-efficient. We have to consider that compliance costs are typically unknown for the tax authorities. Hence, authorities could decide to roll-over obligations to private taxpayers even if this is not a cost-efficient solution. In other words, compliance costs can be partially considered as an externality of authority behavior (Eichfelder and Kegels 2010).

In addition, the distribution of bureaucratic obligations may also affect the perceived fairness of the tax system (for this aspect see Worsham 1996, Kirchler et al. 2008 and van Dijke and Verboon 2010). If taxpayers get the impression that they are “spamed” by the authorities with suspect and bureaucratic obligations reducing their economic resources without an adequate public support, this could be perceived as unfair. It has to be noted that compliance burdens are typically not evenly distributed. Due to divergent information requirements and economies of scale, the cost burden is highest for small businesses and self-employed taxpayers. This is a group that is typically regarded as rather non-compliant (Erard and Ho 2003).

5. Conclusion

In our paper, we investigated the link between tax authority behavior and compliance burdens of business taxpayers. Using Belgian survey data and controlling for potential endogeneity, we found evidence for a significant impact of authority behavior on the burden of red tape. According to our estimate, a customer-unfriendly administration increases the burden of complying with the tax law by about 25 %.

Regarding compliance costs, the most relevant aspect of authority behavior seems to be the timely treatment of businesses' requests in a way that is helpful. By contrast, problems to contact a public agency, contradictory statements and the (insufficient) motivation of administrative decisions do not seem to be as important. However, these aspects could be relevant regarding the trust in and the perceived fairness of authorities. In case of tax law, the strongest cost drivers are the understandability, the coherency and the information content of regulations.

Our result has interesting implications for further research. With regards to the recently introduced "slippery slope" framework (Kirchler et al. 2008), service orientation of public agencies can be interpreted as an instrument to build trust. On the other hand, the underlying effect on the compliance burden implies an implicit power of authorities to increase (or reduce) the effective burden of red tape. This implies a complex relationship between the dimensions of "voluntary compliance" and "enforced compliance".

In this context, the distribution of the overall bureaucratic cost burden between the administration and the private taxpayers seems to be an important issue. Due to insufficient information there may be an incentive for the administration to "shift" the burden of red tape to private taxpayers even if this is not cost-efficient. In addition, this could have a negative effect on the perceived fairness of the tax system with respective consequences on tax compliance behavior.

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Appendix A: Survey questions (extract)

We present an extract of the survey questions in English language (the original questionnaires are in French and Flemish) concentrating on compliance costs and ratings on legislation and administration. Regarding *tax compliance costs*, the questionnaires of

the survey years 2000, 2002 and 2004 include instructions on the cost concept as well as the following questions:¹⁶

1. How many hours of the staff and the management of your enterprise are spent on average per month to comply administratively with the tax regulations? (Consider the best possible estimate for the monthly time effort taking into account the months with a considerably high or low effort.)

Number of hours per month:

2. What is the monthly cost in Euros of these hours spent by the staff and the management of your enterprise to comply administratively with the tax regulations?

Monthly cost:

3. How much does your enterprise spend on average per month for the purchase of external services to consider administrative dispositions regarding the tax regulations? (Consider the best possible estimate for monthly expenses. Take into account within your estimate all payments to receive external support, such as fees for auditors, lawyers or consultants as well as payments for information material necessary to comply with tax regulations.)

Monthly average expenses:

In the survey year 2006 the wording of these questions has been changed. The main difference results from the fact that costs are estimated on a yearly basis:

1. How many hours of the staff and the management of your enterprise have been spent in 2006 to comply administratively with the tax regulations?

Number of hours:

2. What is the yearly cost in Euros of these hours spent by the staff and the management of your enterprise to comply administratively with the tax regulations?

Cost in Euro:

3. How much did your enterprise spent in 2006 for the purchase of external services to consider administrative dispositions regarding the tax regulations? (Take into account within your estimate all payments to receive external sup-

¹⁶ In the 2000 survey, these questions were on Belgian Francs. The surveys in 2000 and 2002 included an additional question on expenses for hardware and software: "What is the monthly cost of amortization of information processing hardware and software necessary to comply administratively with the tax regulations?" To accomplish a consistent cost definition, we do not consider these cost elements.

port, such as fees for auditors, lawyers or consultants as well as payments for information material necessary to comply with tax regulations.)

Expenses in Euro:

In addition to these questions, the questionnaires include *statements on administrative quality*. The wording is identical in all survey years. Answers are given on a five-point Likert scale:

1. It is easy to know, which tax agency should be applied to (AGENCY).
2. It is easy to contact the correct tax agency (CONTACT).
3. The tax administration gives precise answers (ANSWER).
4. Administrative decisions are clearly motivated (MOTIVATION).
5. The administration gives an answer within the expected delay (DELAY).
6. The answer is the same regardless of the contacted service personnel (CONTRADICTION).
7. The obtained information corresponds to your needs (INFORMATION).

Furthermore, the questionnaires include *statements on tax regulations*. The wording is identical in all survey years. Answers are given on a five-point Likert scale:

1. They are brought to your knowledge in advance of their adaption (ADVANCE).
2. They are easy to understand (UNDERSTANDABILITY).
3. Their objectives are clear (OBJECTIVE).
4. They are sufficiently adapted to all the situations (ADAPTION).
5. They are brought to your knowledge in reasonable time to comply (TIME).
6. They are coherent to each other (COHERENCY).
7. They incorporate sufficient and adequate information (ENTROPY).

Appendix B: Additional regression results

The full regression results with regards to the administrative ratings in table 6 are documented by the following tables B.1 and B.2.

Table B.1: Full regression results (table 6)

Model	1	2	3	4	5	6	7
R ²	0.656	0.660	0.658	0.657	0.660	0.655	0.662
Cases	1003	997	1000	1001	1000	993	997
AGENCY	0.030 (0.024)	-	-	-	-	-	-
CONTACT	-	0.038 (0.025)	-	-	-	-	-
ANSWER	-	-	0.078*** (0.026)	-	-	-	-
MOTIVATION	-	-	-	0.073*** (0.026)	-	-	-
DELAY	-	-	-	-	0.080*** (0.025)	-	-
CONTRADICTION	-	-	-	-	-	0.036 (0.028)	-
INFORMATION	-	-	-	-	-	-	0.130*** (0.028)
TURNOVER	0.287*** (0.018)	0.289*** (0.018)	0.286*** (0.018)	0.287*** (0.018)	0.287*** (0.018)	0.285*** (0.018)	0.290*** (0.018)
SELF-EMPLOYED	-0.303*** (0.116)	-0.292** (0.116)	-0.300** (0.117)	-0.297** (0.115)	-0.302*** (0.115)	-0.313*** (0.117)	-0.290** (0.117)
2002	0.054 (0.083)	0.048 (0.083)	0.073 (0.083)	0.064 (0.083)	0.067 (0.083)	0.053 (0.084)	0.069 (0.083)
2004	0.047 (0.089)	0.045 (0.088)	0.065 (0.088)	0.056 (0.088)	0.090 (0.088)	0.058 (0.089)	0.059 (0.088)
2006	-0.519*** (0.105)	-0.522*** (0.105)	-0.489*** (0.104)	-0.501*** (0.105)	-0.476*** (0.105)	-0.514*** (0.106)	-0.488*** (0.104)
OUTSOURCING	-0.284*** (0.050)	-0.282*** (0.050)	-0.279*** (0.050)	-0.276*** (0.051)	-0.277*** (0.051)	-0.278*** (0.051)	-0.274*** (0.050)
INHOUSE	-1.788*** (0.220)	-1.781*** (0.220)	-1.766*** (0.220)	-1.732*** (0.222)	-1.764*** (0.222)	-1.781*** (0.223)	-1.729*** (0.220)
EINDUSTRIAL	0.114 (0.095)	0.112 (0.096)	0.117 (0.095)	0.119 (0.096)	0.136 (0.095)	0.111 (0.096)	0.145 (0.095)
SINDUSTRIAL	0.277 (0.208)	0.261 (0.208)	0.285 (0.215)	0.247 (0.210)	0.254 (0.207)	0.264 (0.211)	0.281 (0.215)
SCONSTRUCTION	-0.028 (0.100)	-0.028 (0.100)	-0.029 (0.100)	-0.0265 (0.099)	-0.022 (0.100)	-0.020 (0.101)	-0.005 (0.100)
SPRIMARY	-0.857*** (0.102)	-0.873*** (0.101)	-0.855*** (0.102)	-0.860*** (0.101)	-0.866*** (0.101)	-0.840*** (0.102)	-0.844*** (0.100)
BRUSSELS	0.078 (0.098)	0.071 (0.098)	0.080 (0.097)	0.082 (0.098)	0.062 (0.098)	0.074 (0.099)	0.078 (0.097)
WALLONIE	-0.134* (0.075)	-0.148* (0.076)	-0.135* (0.075)	-0.138* (0.075)	-0.148** (0.075)	-0.137* (0.076)	-0.132* (0.075)
Constant	5.061*** (0.294)	5.012*** (0.292)	4.903*** (0.290)	4.906*** (0.287)	4.906*** (0.284)	5.068*** (0.290)	4.702*** (0.302)

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1 to 7 include each one administrative aspect.

Table B.2: Full regression results (table 6)

Model	1	2	3	4	5	6	7
R ²	0.658	0.661	0.657	0.658	0.660	0.662	0.661
Cases	993	1001	993	994	1001	998	999
ADVANCE	0.063*** (0.024)	-	-	-	-	-	-
UNDERSTANDABILITY	-	0.115*** (0.026)	-	-	-	-	-
OBJECTIVE	-	-	0.052** (0.026)	-	-	-	-

ADAPTION	-	-	-	0.108***	-	-	-
				(0.028)			
TIME	-	-	-	-	0.084***	-	-
					(0.023)		
COHERENCY	-	-	-	-	-	0.127***	-
						(0.027)	
ENTROPY	-	-	-	-	-	-	0.111***
							(0.025)
TURNOVER	0.286***	0.282***	0.284***	0.284***	0.285***	0.280***	0.279***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
SELF-EMPLOYED	-0.321***	-0.308***	-0.309***	-0.289**	-0.289**	-0.298***	-0.310***
	(0.117)	(0.115)	(0.116)	(0.115)	(0.116)	(0.115)	(0.116)
2002	0.045	0.056	0.056	0.059	0.047	0.064	0.063
	(0.083)	(0.082)	(0.084)	(0.083)	(0.082)	(0.083)	(0.082)
2004	0.032	0.048	0.019	0.064	0.012	0.058	0.042
	(0.089)	(0.088)	(0.089)	(0.088)	(0.087)	(0.088)	(0.088)
2006	-0.527***	-0.492***	-0.497***	-0.495***	-0.518***	-0.499***	-0.497***
	(0.105)	(0.104)	(0.104)	(0.104)	(0.105)	(0.103)	(0.104)
OUTSOURCING	-0.276***	-0.275***	-0.292***	-0.268***	-0.271***	-0.270***	-0.278***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.051)	(0.050)
INHOUSE	-1.801***	-1.779***	-1.833***	-1.758***	-1.758***	-1.759***	-1.792***
	(0.219)	(0.219)	(0.221)	(0.220)	(0.218)	(0.222)	(0.220)
EINDUSTRIAL	0.114	0.131	0.133	0.134	0.135	0.130	0.141
	(0.095)	(0.094)	(0.095)	(0.095)	(0.094)	(0.095)	(0.094)
SINDUSTRIAL	0.284	0.223	0.253	0.281	0.285	0.242	0.217
	(0.212)	(0.219)	(0.210)	(0.225)	(0.206)	(0.215)	(0.216)
SCONSTRUCTION	-0.003	-0.006	-0.023	-0.012	-0.017	0.003	-0.017
	(0.100)	(0.100)	(0.100)	(0.102)	(0.099)	(0.099)	(0.100)
SPRIMARY	-0.853***	-0.877***	-0.864***	-0.871***	-0.892***	-0.860***	-0.878***
	(0.102)	(0.100)	(0.102)	(0.100)	(0.101)	(0.100)	(0.101)
BRUSSELS	0.072	0.085	0.051	0.078	0.093	0.092	0.092
	(0.098)	(0.097)	(0.097)	(0.099)	(0.099)	(0.097)	(0.097)
WALLONIE	-0.152**	-0.183**	-0.155**	-0.172**	-0.152**	-0.161**	-0.157**
	(0.075)	(0.075)	(0.076)	(0.076)	(0.075)	(0.075)	(0.075)
Constant	4.986***	4.790***	5.020***	4.787***	4.925***	4.767***	4.859***
	(0.296)	(0.289)	(0.301)	(0.298)	(0.290)	(0.287)	(0.289)

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level. Models 1 to 7 include each one legislative aspect.

Our analysis could be biased by the fact that some businesses participated more than one time within the presented surveys on tax compliance costs. To control for a corresponding bias, we excluded all businesses from the data set that participated the second or the third time. The following table B.3 presents the corresponding regression results.

Table B.3: Additional regression results (cross check for table 9)

Model	CC1	EC1	PC1	CC2	EC2	PC2
R ²	0.687	0.665	0.717	0.685	0.662	0.717
Cases	731	676	719	731	676	719
RATIO ADMINISTRATION	0.945*** (0.330)	1.052*** (0.355)	0.745** (0.353)	0.235*** (0.089)	0.246** (0.095)	0.265*** (0.097)
RATIO LEGISLATION	1.428*** (0.478)	1.483*** (0.496)	1.536*** (0.516)	0.246*** (0.094)	0.233** (0.100)	0.231** (0.099)
AVERAGE ADMINISTRATION	0.027 (0.047)	0.022 (0.050)	0.030 (0.048)	0.046 (0.047)	0.044 (0.050)	0.053 (0.048)
AVERAGE LEGISLATION	0.183*** (0.050)	0.178*** (0.053)	0.196*** (0.055)	0.197*** (0.051)	0.190*** (0.054)	0.209*** (0.055)
TURNOVER	0.286*** (0.020)	0.284*** (0.021)	0.281*** (0.021)	0.287*** (0.020)	0.286*** (0.021)	0.283*** (0.021)
SELF-EMPLOYED	-0.209* (0.121)	-0.241* (0.125)	-0.107 (0.133)	-0.202* (0.121)	-0.231* (0.124)	-0.098 (0.132)
2002	0.040 (0.084)	0.059 (0.088)	-0.041 (0.087)	0.047 (0.084)	0.067 (0.089)	-0.030 (0.087)
2004	0.098 (0.116)	0.137 (0.120)	-0.010 (0.119)	0.087 (0.117)	0.126 (0.120)	-0.012 (0.119)
2006	-0.350*** (0.107)	-0.363*** (0.113)	-0.507*** (0.111)	-0.343*** (0.107)	-0.354*** (0.114)	-0.491*** (0.112)
OUTSOURCING	-0.342*** (0.056)	0.728*** (0.056)	-1.069*** (0.063)	-0.342*** (0.057)	0.729*** (0.056)	-1.071*** (0.064)
INHOUSE	-2.038*** (0.246)	-	-3.932*** (0.267)	-2.058*** (0.247)	-	-3.962*** (0.269)
EINDUSTRIAL	0.146 (0.106)	0.149 (0.109)	0.167 (0.108)	0.141 (0.107)	0.145 (0.110)	0.165 (0.109)
SINDUSTRIAL	0.032 (0.207)	-0.071 (0.228)	0.182 (0.201)	0.089 (0.205)	-0.027 (0.219)	0.243 (0.199)
SCONSTRUCTION	0.000 (0.110)	-0.016 (0.118)	-0.017 (0.124)	-0.005 (0.111)	-0.023 (0.119)	-0.024 (0.125)
SPRIMARY	-0.917*** (0.111)	-0.910*** (0.118)	-0.953*** (0.120)	-0.929*** (0.111)	-0.925*** (0.118)	-0.965*** (0.119)
BRUSSELS	0.032 (0.104)	0.035 (0.108)	0.081 (0.114)	0.011 (0.104)	0.011 (0.109)	0.062 (0.114)
WALLONIE	-0.119 (0.083)	-0.112 (0.087)	-0.065 (0.083)	-0.127 (0.083)	-0.124 (0.087)	-0.070 (0.083)
Constant	1.928*** (0.635)	1.855*** (0.663)	0.569 (0.724)	4.098*** (0.337)	4.184*** (0.355)	2.624*** (0.381)

Dependent variable: logarithm of compliance costs. Robust standard errors are in parentheses; *** / ** / * indicate statistical significance on the 1% / 5% / 10% level.