Recession and Tax Compliance – The Case of Slovenia

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In this paper, we focus on the area of public finances, where the consequences of recession and government's responses to its effects significantly influenced some macroeconomic categories. Government deficits and government debts increased and collected revenues dropped. In addition, the economic crisis influenced a basic element of modern tax systems, i.e. tax compliance, where the consequence has been an increase in the tax debt. Data for Slovenia show that the amount of outstanding tax obligations during the recession increases, while the amount of collected revenues simultaneously drops. Thus, in 2011, the amount of tax debt grew to over 0.9 billion EUR, which is equivalent to the deficit in the general public finance budget.

In our analysis, we examine the influence the recession has had on tax compliance in Slovenia. As a measure for non-compliance, we used data on tax debt (unpaid taxes). On the basis of the tax debt fluctuations and the results of regression model, we have discovered that economic fluctuations have significantly influenced the level of tax compliance. As significant explanatory variables, we point to the fluctuations of the average wages in the private sector and also the unemployment rate, which has been steadily increasing during the course of the recession. We also believe that the possibility for less restrictive measures of fiscal policy during the times of economic recession (tax enforcement activities, temporary reprieves, and instalment plans) is worth discussing.

Keywords: *recession, tax compliance, tax debt, tax debt collection, financial crisis.*

Introduction

In this paper we will focus on the area of public finances, where the consequences of recession and government's responses to its effects, significantly influenced some macroeconomic categories. For example, government deficits increased. European Statistical Office (Eurostat) data suggest that the government deficits of the European Union (EU) members (EU27) increased from -0,6 % of GDP in the year 2000 to -2,4 % of GDP in the year 2008 and to -6,6 % of GDP in the year 2010. The same indicator for countries using the euro in 2008 was -2,1 % of GDP and -6,2 % GDP for the year 2010. There were also concerns about government debt, which in 2008 amounted to 62,5 % of GDP in the EU27 but climbed to 80.1% of GDP in 2010. Government debt indicators were similar for countries using the euro: in their case, the average government debt in the year 2008 was 70,1 % of GDP and 85,3 % of GDP in 2010.

Likewise, in Slovenia both of the above-mentioned indicators worsened. According to data from the Statistical Office of the Republic of Slovenia (SURS), government deficit was -1,1 % of GDP in 1996, -1,9 % of GDP in 2008 and -5,8 % of GDP in 2010. Government debt increased from 21,9 % of GDP in the year 2008 to 38,8 % of GDP in the year 2010. In addition, economic crisis influenced the basic element of modern tax systems, i.e. tax compliance, a consequence of which has been an increase in the tax debt. From the Organisation for economical cooperation and development (OECD) Comparative Information Series about movements in revenue bodies, debt inventories over two year period from 2007 to the end of 2009 (the period

covering the crisis) the following observations can be made: Almost 40 % of revenue bodies reported a more than 20 % increase in the aggregate value of their debt inventory over these two years; for 13 revenue bodies, this increase exceeded 40 %. Just over one fifth of revenue bodies (10) reported the increase of more than 20 % in the number of debt cases/debtor taxpayers over two years; for two revenue bodies, this increase exceeded 40 % (OECD, 2011).

The respective increase has had an impact on the broader macroeconomic situation, especially government debt. Tax debt represents the sum of unpaid tax obligations, which subsequently reduces the income balance of public budgets. However, this fact might be connected with the amount of government debt. Due to the deficit caused by uncollected revenues, the government has to ensure the stability of the public finance budget in other ways. In the case of the state budget deficit, the treasury has to ensure the money for the payment of public expenditures with the issue of a bond. Potential buyers of treasury bonds are foreigners, domestic households and businesses, domestic financial sector and the central bank (Senjur, 2001). Borrowing by the treasury means that the public debt is issued. This debt is either sold to residents or companies, or to the central bank. The manner of the funding has an important effect on the efficiency of fiscal policy (Senjur, 2001). The effect of public sector borrowing on the Lithuanian economy is discussed by (Karazijiene, 2009). The authors' aim was to determine a possibility to forecast the limits of the national debt acceptability, knowing the forecasted actual GDP growth and the value of the budget deficit. The authors also stressed that it is important to learn what level of the fiscal

deficit is acceptable to the state and how it could be managed under certain economic conditions. Current data on the required long-term profitability of the Slovenian government's long-term debt securities certainly confirm the sensibility of public finance deficit funding.

Slovenian tax system (like the modern tax systems of other countries) is based on voluntary tax compliance, which in practice means that the majority of taxpayers fulfil their tax obligations in the legally defined terms and with the anticipated amount. Tax obligations (taxes and contributions by businesses, i.e. legal persons and entrepreneurs) are found in their tax returns (corporate income tax, tax on income activity, social security contributions, and the value added tax – VAT). This is so-called self – taxation, where taxpayers alone present their taxes in their tax returns and on that basis calculate their obligations. Difference between the calculated tax obligations and actually paid revenues constitutes the tax debt, a category which is recorded by The Tax Administration of the Republic of Slovenia (DURS). At the same time, legal measures for the control of tax debt are performed (these procedures are defined by the Tax Procedure Act).

There is a broader aspect of tax avoidance. In this paper, we will discuss the tax obligations that are presented in the tax returns of taxpayers and which are, on this basis, recorded by the tax authority. Still, in the modern tax system, the grey economy promotes illegal tax evasion and tax fraud. Taxpayers do not report (or under-report) their incomes, and the tax authority cannot record these incomes and cannot control the proper payment of tax obligations. (Krumplyte & Samulevicius, 2010) discussed the undeclared work and considered it in the context of tax non-compliance, disassociating from economic activities attributable to unregulated economy. The authors offered the results of empiric research on distribution of undeclared work phenomena in Lithuania and trends (of the periods 2006–2008 and 2009–2011) pertaining to the extent of undeclared income (employment income and earnings received from self-employment). (Putnins & Sauka, 2011) analysed the size of shadow economies in Estonia, Latvia and Lithuania. Their results suggest that shadow economy in Latvia in 2010 was considerably larger than in neighbouring Estonia and Lithuania. (Feld & Schneider, 2010) provided the survey on the shadow economy and undeclared earnings in OECD Countries. In this respect the authors argued that in comparison with the impact of tax morale, deterrence is quantitatively less important. Likewise, (Buehn & Schneider, 2012) in their paper studied the impact of enforcement on the shadow economy.

In the present paper we focus on the tax compliance in the restricted sense, namely on the tax debt. Tax debt is a measurable category; still, one has to understand a broader consequence of tax noncompliance, the tax gap. (Mazur & Plumley, 2007) explained the concept of the tax gap, discussed how it is estimated, and pointed to some limitation with the estimates. Likewise, (Olson, 2009) discusses the tax gap in the USA and suggests a ten-step approach for improving compliance.

During economic recession, the position of enterprises worsens, incomes decrease, the number of business transactions drop, and profits fall. Companies struggle to deal with outstanding obligations, including taxes and contributions for the state. In the case of an inability to settle tax obligations, different institutes are available to the taxpayers. Their purpose is to help, by offering the possibility of delayed payments or paying via an instalment plan. Conditions for these institutes are defined in the Tax Procedure Act and in the Rule of performing the Tax Procedure Act. If a taxpayer (an enterprise) does not fulfil these conditions, the advantage of a temporary reprieve or instalment plan cannot be taken, and taxpayers are obligated to pay their taxes within the legally defined terms. If the taxes are not paid voluntarily and in legal terms, the tax authority initiates an enforcement procedure (tax debt collection) in accordance with the provisions of the Tax procedure Act.

Taxpayers who do not fulfil voluntarily their tax obligations are considered to be tax debtors in terms of official procedure. Data for Slovenia show that since 2008 the number of tax debtors has risen in comparison with previous years; correspondingly, the amount of tax debt has also increased.

The aims of our research are as follows:

1. To explain the influence of economic recession on tax compliance in Slovenia, especially with regard to fluctuations in tax debt. We will attempt to establish the connection between some determinants of economic recession and tax debt.

2. To determine the intensity and importance of individual factors of economic recession on tax compliance, and thus on the amount of tax debt.

3. In addition, we will discuss some special administrative attempts to alleviate the impact of the recession on tax compliance.

The object of the research is a tax debt and its fluctuations in Slovenia.

The research methods: we will test an econometric model for the explanation of the tax compliance dependence due to economic recession factors. With respect to the special administrative attempts to alleviate the impact of recession on tax compliance we will examine the relevant literature.

In the context of Slovenia this study gives the empirical results of tax debt fluctuations dependence for the first time. Moreover, our analysis presents an original contribution to the studies of the tax compliance dependence, namely within relevant literature we did not find any econometric explanation of tax debt fluctuations dependence from the determinants of economic recession.

Literature review

We only found a few studies that addressed the issue of tax compliance and business cycle. (Plumley, 1996) discussed different determinants of individual income tax compliance in the United States and found that the unemployment rate appears to have a strongly significant, negative impact on reporting compliance. (Brondolo, 2009) established that the empirical evidence concerning the impact of recession on taxpayer compliance is sparse, but tends to confirm a likelihood of some worsening. (Cai & Liu, 2009) investigated whether market competition

enhances incentives of Chinese industrial firms to avoid corporate income tax. They found robust and consistent evidence that firms in more competitive environments engage in more tax avoidance activities. They also found that corporate income tax evasion is negatively correlated with access to credit, suggesting that compliance can be expected to decline when an economic downturn is combined with tight credit conditions. (Schneider, 2010) reported on the development of shadow economy in Germany, Greece and additional 19 OECD countries since 1990 and provided first and preliminary calculations for 2010, taking the continuing economic crisis into account. As a result of the world-wide economic crisis, all OECD countries are again expected to face a renewed increase in the size of the shadow economy for the second time in 2010 (the first time was in 2009).

Tax compliance is also affected by many other factors. The level of tax burden or tax rate is important, even if it is not directly connected with the economic crisis. Otherwise, it is reasonable to analyse the influence of tax burden on tax compliance over a longer time period.

From the broader aspect of non-payment of taxes, the level of tax morale should also be noted, namely society's awareness of the importance of paying taxes and their use to fund public benefits. The higher such awareness is, the higher level of tax compliance is expected. Another relevant factor with respect to tax compliance is the level of successful control, detection and punishment of tax fraud. When tax fraud and illegal tax evasion are detected and appropriately sanctioned, it is reasonable to expect a reduction in such activities and vice versa.

Otherwise, many authors have investigated different indicators that could affect tax compliance. Thus, (Ravikumar & Zhang, 2012) studied an optimal auditing of taxpayer's income in a dynamic principal-agent model of hidden income. Likewise, Kastlunger *et al.*, (2009) studied the effect of different audit patterns on future compliance in two experiments. (Muehlbacher *et al.*, 2011) hypothesized that voluntary compliance depends primarily on trust in authorities, whereas enforced compliance is a function of the power attributed to authorities. These hypotheses could be confirmed using a large data set on taxpayers from Austria, the United Kingdom and the Czech Republic. The authors also stated that whereas voluntary compliance seems to be positively related to age and education, enforced compliance is negatively related to education. (Murphy, 2005) showed that attempts to restrain and threaten taxpayers into compliance can undermine the legitimacy of the Tax Office authority, which in turn can affect the subsequent compliance behaviour of taxpayers. (Verboon & van Dijke, 2011) pointed to the role of procedural fairness and effectiveness of sanction severity in compliance with authorities. (Hartner *et al.*, 2010) showed that both forms of tax compliance (i.e., individual and collective European Union - tax compliance) were influenced by perceived distributive fairness judgments of the EU transfer payments. (Lubian & Zarri, 2011) presented empirical evidence that "tax morale" - taxpayers' intrinsic motivation to pay taxes – constitutes a new determinant of happiness, even after controlling for several demographic and socioeconomic factors. (Alm & Torgler, 2011) argued that puzzle of tax compliance can be explained, at least partially, by recognizing the typically neglected role of ethics in individual behaviour. (Walsh, 2012) argued that better understanding of the motives of taxpayers and their attitudes and behaviour towards taxation can improve both voluntary compliance and efficiency of the tax administration. (Ahmed & Braithwaite, 2005) could confirm the thesis that discontent with the provision and funding of higher education plays a significant role in lowering tax compliance. (Kondrad & Qari, 2011) found a robust positive association between patriotism and tax compliance. Batrancea *et al.*, (2012) in their paper reviewed the models of tax compliance with an emphasis on economic and behavioural perspectives. (Palil & Mustapha, 2011) concluded that in the self assessment system in Malaysia, tax knowledge has a significant impact on tax compliance. The authors also found that tax compliance is influenced by probability of being audited, perception of government spending, penalties and personal financial constraints. (Jakstonyte & Boguslauskas, 2010) carried out the research of taxes, regulating the land site taxation, from the aspect of employment of taxpayer deduction. (Raskolnikov, 2009) proposed separation and targeted enforcement in connection to different groups of taxpayers based on their taxpaying motivations. (Li-Chen, 2008) studied tax evasion and voluntary contributions in the case when both publicly and privately provided public services are present. The theoretical analysis of (Torgler, 2008) highlights the relevance of extending the standard theories of tax fraud, which are based on a narrow deterrence concept. The author discussed recent tendencies that stress the importance of social norms and institutions. (Kindsfateriene & Lukasevicius, 2008) proved that lower rates for income taxes lead to the extension of tax basis so that budget revenues increase, while the level of shadow economics, on the contrary, decreases due to the fact that the economic stimuli to hide income and to avoid paying the taxes are reduced. (Ivanenko, 2005) aimed to clarify the issue of regulated tax burdens and avoidance during the Russian transition period. The author investigated statutory tax rates (STR) for businesses, which are often criticized as excessive and responsible for driving business underground. The article found that STR were manageable for most sectors, but not for the oil and gas sector. (Ivanenko, 2005) introduced an econometric model to estimate the influence on unpaid taxes as the dependent variable. As explanatory variables, the author introduced the fraction of consumables in total revenue, the average employment rate, the fraction of sales made by the four largest firms and gross profit:

$$Tax\ Unpaid_t = \beta_o + \beta_1\ Consumables_t \qquad (1)$$
$$+ \beta_2\ Average\ Employment_t + \beta_3\ CR4_t$$
$$+ \beta_4\ Profit_t + u_t$$

The usual proxy that measures the extent of the grey economy is the amount of cash in circulation. It is based on the assumption that cash does not leave a "paper trail" and, hence, is ideal for tax evasion. The problem is that data for the use of cash by various sectors do not exist. The author believed that the fraction of consumables in total revenue is closely correlated with cash because a trade between individuals is usually conducted in cash. The results of the

regression have shown that the average employment rate and the gross profit are important. Sectors that are more profitable have been found to avoid taxes more.

Tax debt in Slovenia

Until the year 2008, the extent of collected revenues in Slovenia steadily increased, in conjunction with GDP growth. Both categories reached their peak in 2008 and then started to fall (Figure 1). At the same time, we observed the course of the tax debt in the period from 2006 to 2011 (Figure 2). Figure 2 shows that the tax debt increased over the observed period. In the year 2011, unpaid tax obligations reached a sum of 0,9 billion EUR (constant prices – year 2005).
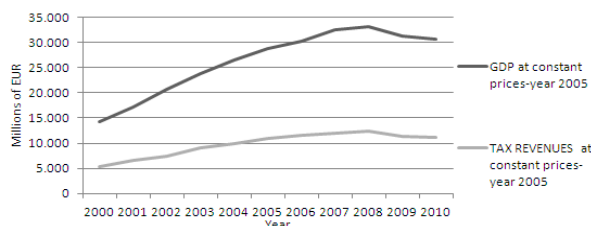

Figure 1. Course of GDP and collected revenues in 2000–2010 (in millions of EUR). Source: SURS and Ministry of finance of Republic of Slovenia (MF).

Tax debt consists of two categories, namely "active tax debt" (with respect to this category, the tax administration can take enforcement measures, i.e. tax debt collection) and "off – balance tax debt" (so called potentially recovered tax debt, where there is a smaller possibility for successful tax collection). The majority of the potentially recovered tax debts represent debts due to bankruptcies, compulsory settlements and cancellations). In connection with the recording of the tax debt, DURS also has the possibility of potentially recovered tax debt treatment in the tax evidence, which means that DURS could transfer the potentially recovered tax debt in the off – balance tax debt evidence. Afterwards, such tax debt no longer represents active tax debt, where enforcement measures could succeed. During the recession, the number of bankruptcies and compulsory settlements increased and

this has been reflected in the increase of the tax debt (potentially recovered tax debt). In our analyses, we considered both tax debt categories.

Figure 2. Course of tax debt in 2006–2011 (in millions of EUR) Source: DURS.

However, we did not consider the uncollectible debt in our analysis as it is not a part of the tax debt recorded by DURS. It is recorded separately, and only evidentially. The main causes for uncollectible debt are: death of taxpayer, where there are no inheritors and no property; relative and absolute limitation; cessation (bankruptcy, liquidation, cancellation) of the legal subjects, where there are no universal legal successors.

We assumed that tax compliance was reduced during the period of crisis, which lead to the increase in the tax debt amount. In this respect, we emphasize a double negative impact of economic crisis: as the amount of tax debt increases, there is a decline in the collected amount of revenue.

Data and methodology

To determine the dependent variable "voluntary tax compliance" we used the monthly time series data from DURS on the fluctuation of tax debt for the period from December 2006 to June 2011. Data were deflated by the consumer price index (for the base period we used the first observed period). Based on the deflated data, the monthly changes of the dependent variable were calculated (changes in the current month compared with the previous month).

Table 1

Statistical properties of selected data

Variable	Unemployment	Average wages in the private sector	Company incomes	Slovenian Stock Exchange index	Indexes of the industrial production	Tax debt
Abbreviation	UN	WAG	INCO	SSI	IIP	TD
Mean	100,5698	100,1873	100,3379	98,98044	99,91865	100,3431
Median	100,0000	100,3833	99,05715	98,77723	99,69733	100,1997
Maximum	111,4286	103,7813	141,3966	114,8304	106,0063	116,8476
Minimum	95,65217	96,98380	59,33053	83,19054	87,15131	86,61187
Std. Dev.	3,111129	1,655676	16,03537	6,944418	3,696133	4,679694
Skewness	0,889340	-0,083262	0,324818	-0,108181	-0,773694	0,446164
Kurtosis	4,210566	2,162226	3,571176	3,263788	4,071567	5,695441
Jarque-Bera	10,41564	1,641589	1,683606	0,261892	7,970989	18,13871
Probability	0,005474	0,440082	0,430933	0,877265	0,018583	0,000115
Augmented Dickey-Fuller test statistic	-4,210541	-4,830589	-9,173866	-4,773155	-8,761294	-11,55998
Prob.*	0,0015	0,0003	0,0000	0,0003	0.0000	0,0000
Sum	5430,767	5410,115	5418,248	5344,944	5395,607	5418,526
Sum Sq. Dev.	512,9937	145,2869	13628,05	2555,922	724,0540	1160,675
Observations	54	54	54	54	54	54

*Note:*Note:*MacKinnon (1996) one-sided p-values.*

As we can see from Table 1, three out of six time series exhibit empirical distributions, which differ from a normal distribution. But as we will see in diagnostic tests for the model, this finding did not influence the properties of the model. We also tested if the data were stationary in order to avoid the problem of spurious regression. The unit root test was performed with the Augmented Dickey-Fuller test. Test statistic is reported in Table 1. In all cases we tested models that only include a constant as an exogenous variable. The results suggest that all time series are stationary.

A regression function with the following specifications was formed:

$$d(Tax\ debt_t) = \beta 0 + \beta 1 d(Unemployment_t)$$
$$+ \beta 2 d(Average\ wages\ in\ the\ private\ sector_t)$$
$$+ \beta 3 d\ (Company\ Incomes_t) \quad\quad (2)$$
$$+ \beta 4 d(Slovenian\ Stock\ Exchange\ index_t)$$
$$+ \beta 5 d(Indexes\ of\ the\ industrial\ production_t)$$
$$+ D1_t + D2_t + u_t$$

We considered the present economic situation as the basic factor that affects tax compliance ability. Due to the short time series data on tax debt, we applied the level of unemployment (which is available monthly by SURS) instead of data on GDP fluctuation. We used monthly changes of this category (changes in the current month compared to the previous month). A positive correlation between the level of unemployment and the tax debt amount was expected.

An important indicator of the economic situation is the average wage in the private sector. The Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES) provides monthly data on wages by legal persons (without legal persons in the public sector) to be paid out. In accordance with the annual statistical research programme, AJPES performs statistical research monthly on gross wages to be paid out. This data includes the amount of wages to be paid out and the number of employees who received a wage by the individual legal person, which is separate for the employees whose position is regulated by the Collective Agreement provisions and separate for the employees, whose position is not regulated by the Collective Agreement provisions, as well as the average amounts of wages to be paid out, and the highest wages by the individual employer. To calculate average wages, AJPES applies data on the number of employees on the basis of performed hours (AJPES web page).

In our model, the data were deflated with the consumer price index (for the base period we used the first observed period) and monthly changes were calculated as the changes in the current month compared with the previous month. With reference to this variable, a negative correlation was expected, which is to say that in the case of the reduction of the average wages, the amount of tax debt would be expected to increase and vice versa.

Taxpayers' general financial ability (liquidity) also influences tax compliance. For this purpose, AJPES monthly data on the legal persons' bank accounts receipts were applied. Monthly changes (changes in the current month compared to the previous month) of the deflated data (data were deflated with the consumer price index and the first observed period was used for the base) were calculated. In the model, a negative correlation in connection with this variable was expected, i.e. if the receipts increase, tax compliance ability will also increase, and the tax debt balance will subsequently fall.

We believe that the value of the Slovenian Stock Exchange index (SBI) can be considered as a representative indicator of the economic situation. Value fluctuation data from the SBI TOP (Slovenian blue–chip index) were applied. The data were collected from the Ljubljana Stock Exchange web page. Monthly changes (changes in the current month compared to the previous month) were used in our model. Again, a negative correlation with the tax debt fluctuation was expected with respect to this variable.

We also decided to include industrial production indices that are available monthly from SURS; seasonal and calendar adjusted data were applied. From the SURS data (where the indices are based on the 2005 average) monthly changes for the observed period were calculated (changes in the current month compared to the previous month). It is reasonable to expect a negative correlation with respect to tax debt.

In our opinion, a relevant factor that affects the level of tax compliance is the level of payment indiscipline. Payment indiscipline is an important factor in the non-payment of taxes and can be especially connected with VAT, since tax avoidance among business subjects appears to be the most evident. Namely, in practice, taxpayers cannot always achieve an agreement with their business partners about the settlement of outstanding obligations; however, VAT in this respect (which is simultaneously presented in the tax return) has to be paid within the legally defined terms. The respective variable could not be introduced due to the lack of relevant time series data.

In the model, we also tested the level of credit (lending) activity of the Slovenian bank system (monthly changes of lending were applied). However, this variable was proven to be statistically insignificant.

Results

The results of the model represented by equation (2) are in Table 2. The parameters of the model were estimated using the OLS (ordinary least squares) method. After adjustments due to lagged variables, the model was estimated for the period 2007M09 to 2011M06. The sample size was 46 observations. To account for seasonal effects, we tested the seasonal influence directly in the model for all months, and the results include the seasonal influences for March and April only. For other months the seasonal component was not confirmed. Dummy variables were added (D1 for seasonal influences in March and D2 for seasonal influences in April).

Before we comment on the results, we will present the results of the tests that were applied in order to check the robustness of the model. We first performed a Ramsey RESET test in order to check if the model was correctly specified. As we can see in Table 2, the RESET test shows no indication of any possible misspecification. This is also confirmed by the Likelihood ratio test statistic.

Table 2

The results of the model

	Coefficient	Std. Error	t-Statistic	Prob.
Constant	171,7495	29,90722	5,742744	0,0000
UN	0,411498	0,130516	3,152847	0,0032
WAG	-0,617471	0,240305	-2,569528	0,0142
INCO	-0,094232	0,025277	-3,727978	0,0006
SSI	-0,207200	0,062798	-3,299472	0,0021
IIP	-0,214546	0,101287	-2,118192	0,0408
D1	-2,919485	1,346673	-2,167924	0,0365
D2	2,847691	1,330794	2,139843	0,0388

R-squared	0,686950	Mean dependent var		100,3312
Adjusted R-squared	0,629283	S.D. dependent var		3,680202
S.E. of regression	2,240749	Akaike info criterion		4,608268
Sum squared resid	190,7963	Schwarz criterion		4,926292
Log likelihood	-97,99016	Hannan-Quinn criter.		4,727402
F-statistic	11,91233	Durbin-Watson stat		1,843799
Prob(F-statistic)	0,000000			

Ramsey RESET Test:				
	Value	df	Probability	
t-statistic	1,263739	37	0,2142	
F-statistic	1,597037	(1, 37)	0,2142	
Likelihood ratio	1,943850	1	0,1633	

Residuals:			
	Value		Probability
Jarque-Bera	0,254980		0,880302

Note: Dependent Variable: TD, Method: Least Squares, Sample (adjusted): 2007M09 2011M06, Included observations: 46 after adjustments

Table 3

Correlation matrix for explanatory variables

	UN(-6)	WAG	INCO(-8)	SSI	IIP(-7)
UN(-6)	1,000000				
WAG	-0,043940	1,000000			
INCO(-8)	-0,038403	-0,055212	1,000000		
SSI	0,348710	-0,146200	-0,097737	1,000000	
IIP(-7)	-0,258963	0,035153	-0,354453	0,023932	1,000000

One of the basic assumptions of the OLS method is that residuals are distributed normally. Deviation from this assumption would mean that all test statistics are not correctly estimated. We therefore performed the Jarque-Bera test. The results can be seen in Table 2. Based on the value of the test statistic, we can conclude that the residuals are normally distributed.

Since this is a time series model, we next checked for the presence of autocorrelation. The results of the Durbin-Watson test are reported in Table 2. Additionally, we also performed the tests for high order autocorrelations; however we could not confirm the presence of autocorrelation. We also performed a White test in order to check for the presence of heteroscedasticity (the results are not reported in the table, but can be obtained from the authors). We could not detect the presence of heteroscedasticity.

We also tested for the presence of multicollinearity. The results of the model in Table 2 and the correlation matrix in Table 3 indicate that the effects of possible linear relationship between variables are not important. This was also confirmed by the estimated variance inflation factor

(the results are not reported, but can be obtained from the authors).

Finally, we also tested the stability of the estimated coefficients in the model. We performed the CUSUM and CUSUM of Squares tests. The results of both tests are presented in Figure 3. We can see that the estimates of the coefficients remained stable during the observed period.

The regression results were in line with our expectations. To determine the significance of individual economic recession indicators, the product of the average value of the explanatory variable (the average value of monthly changes) and the regression coefficient were calculated for each of the explanatory variables and the absolute values of the respective products were then compared. In terms of the most important variables, we can observe that the unemployment rate has a positive regression coefficient while the average wages in the private sector boast a significantly negative regression coefficient.
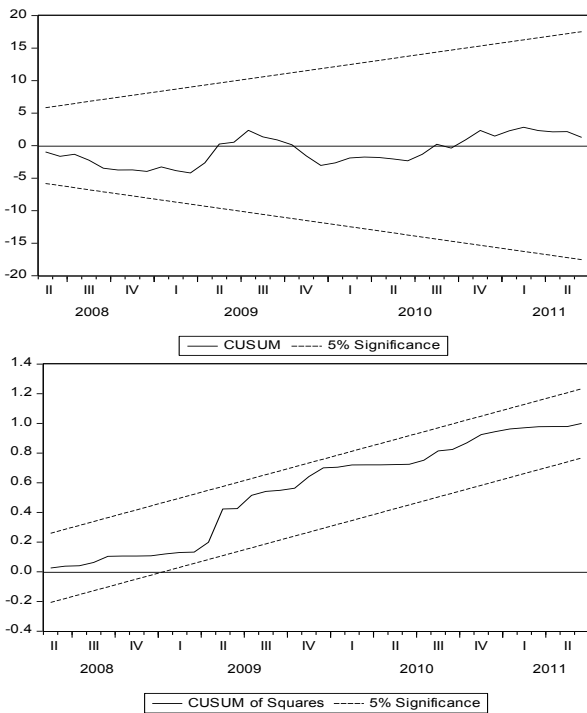
Figure 3. CUSUM and CUSUM of squares tests

Figure 4. Collected revenues by DURS in 2000-2010 (in millions of EUR). Source: DURS

Could the government, by relaxing this fiscal policy area (the enforcement activities) and/or with easier requirements for a temporary reprieve and instalment payments, facilitate business activities during the economic crisis? Certainly less restrictive measures of this fiscal and tax policy segment might be applied, which could help mitigate the liquidity problems of business subjects. On the other hand, it is necessary to consider the income balance of the state budget, where the main source is business taxes.

Figure 5. Collected tax debt by DURS in 2000–2010 (in millions of EUR) Source: DURS

Variable incomes, the Slovenian Stock Exchange Index and Industrial production indices also showed negative coefficients, as expected.

Discussion

The recession obviously had a significant impact on public finances. Data for Slovenia show that the amount of outstanding tax obligations during the recession increases, while the amount of collected revenues simultaneously drops. Thus, in 2011, the amount of tax debt grew to 0.9 billion EUR (constant prices – year 2005), which is equivalent to the deficit in the public finance budget (the state budget, municipal budgets, The Pension and Disability Insurance Institute of Slovenia, The Health Insurance Institute of Slovenia).

A relevant question is what measures should be undertaken in order to increase the level of tax compliance, especially during a period of economic crisis. Are strict enforcement activities (i.e. tax debt collection) the most appropriate instrument for bringing about tax compliance? The data for Slovenia show that until 2008 the collected revenues increased while the level of collected tax debt also increased. After 2008, the collected revenues decreased, while the level of collected tax debt nevertheless increased (Figure 4 and 5). This fact becomes understandable when we remember that when the economic situation worsens, the number of the taxpayers who are not able to fulfil their tax obligations rises. Consequently, the tax administration performs enforcement activities.
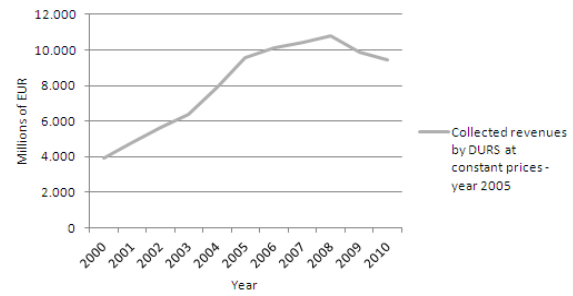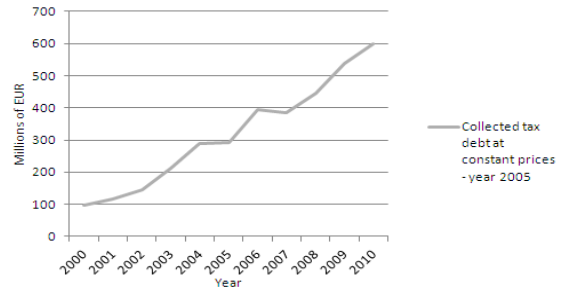
Many governments have realized the implications of the global financial crisis and their fiscal administrations have taken some measures to mitigate the issues of the crisis in the area of tax compliance. OECD Comparative Information Series provides findings about special administrative measures to alleviate the impact of the crisis, which were reported by around 75 % of revenue bodies; these included easier criteria for granting reprieves to pay tax (29 revenue bodies), reduced rates of interest for the late payment of taxes (17), longer periods for filing tax returns (7), and more lenient criteria for writing off tax debts (7) (OECD, 2011).

Brondolo (2009) proposed the development of tax compliance strategy for the economic crisis by tax agencies to address the emerging challenges to revenue administration. This study believes that two objectives should be sought, and that a tax agency's fundamental objective during economic crisis should be to contain a rise in non-compliance. If left unchecked, the rising tide of non-compliance could lead to substantial foregone revenue as well as provide an unfair competitive advantage for non-compliant businesses. Containing non-compliance in the crisis requires tax agencies to adjust their taxpayer services and enforcement program for newly emerging compliance risks. The second objective underlined in the study is to

help taxpayers cope with the pressures of the crisis. During the crisis, many viable businesses can be expected to experience severe financial stress that could cause them to cease their operations and exit the tax system, resulting in permanent revenue losses. Measures that can enhance the probability of taxpayers staying in the tax system include adjusting advance payments, accelerating tax refunds, and making greater use of payment extensions. To the extent that these measures provide an element of fiscal stimulus, decisions about their introduction should be made at an appropriate level within the government and factored into the country's overall economic program for the crisis (Brondolo, 2009). Also, supporting measures to achieve these objectives were provided in this study, which were divided into four pillars: 1) Expanding assistance to taxpayers, 2) Refocusing enforcement on the emerging areas of non-compliance that pose greatest risk to revenue collection, 3) Enacting legislative reforms that facilitate administration, and 4) Improving communication with the taxpayer population (Brondolo, 2009).

(Brojba *et al.*, 2010) provided analysis of the appropriate strategies of fiscal administration during economic crisis. Because of the contribution to the growth of the revenues to the consolidated budget, important especially during economic crisis, the authors considered the analysis and modelling of several default options included in the Fiscal Procedure Code, both with respect to debt collection and tax inspection. Their study concluded that in the early periods of economic crisis it is not the ease of tax administration (rescheduling, delays, and exemptions) that leads to an effective policy but rather government policies that reduce the probability of bankruptcy among companies.

A relevant and topical issue is the effect of less restrictive fiscal policy measures on tax compliance during the recession. (Lesnik, 2012) argued that introduction of special administrative measures to help taxpayers with the impact of crisis is certainly worth to discuss. However, it is necessary to consider the impact of those measures on the income balances of public budgets, where the main source represents taxes and contributions of business subjects. Many authors have indicated that, as an alternative to enforcement activities, there is an increase in different measures of fiscal policy for the purpose of tax compliance. Still, detailed analysis of the respective area exceeds the purpose of our research, which we introduced to discuss the influence of recession indicators on taxpayer's ability to fulfil their tax obligations voluntarily and in accordance with the law.

Conclusion

The recession had a significant impact on public finances and influenced negatively on tax compliance, as well. This fact might be connected with an increase in the tax debt, since according to OECD data the majority of revenue bodies reported a considerable increase in the aggregate value of their debt inventory within the period 2007–2009 (the period covering the crisis). Likewise, in Slovenia tax debt increased during the course of recession, thus in the year 2011 unpaid tax obligation reached a sum of 0.9 billion EUR. Tax debt represents the sum of unpaid

tax obligations, which subsequently reduces the income of public budgets and can be considered as the measure of tax compliance in the restricted sense. Still, a broader consequence of tax noncompliance is important, namely the tax gap. Although the empirical evidence concerning the impact of recession on taxpayer compliance is sparse, it tends to confirm the likelihood of worsening.

In our analyses we assess the dependence of tax compliance from recession indicators in the case of Slovenia. For an indicator of tax compliance reduction, we applied data on unpaid taxes, namely the tax debt. In addition, we summarize our findings:

1. On the basis of the regression model results, we discovered that economic downturn has significantly influenced the tax compliance level reduction in Slovenia. All of the explanatory variables have proven highly statically significant and the regression coefficients were in line with our expectations. Thus, the unemployment rate with the positive regression coefficient suggests that in the period of economic crisis when the level of unemployment increase, the respective has an impact on the increase in tax debt amount, respectively on the reduction of the level of tax compliance. Average wages in the private sector, company incomes, The Slovenian Stock Exchange Index and industrial production indices all show the negative regression coefficients which imply that worsening of these categories influences positively on the tax debt amount, respectively on the decrease in tax compliance. We believe the presented model confirms the dependence of tax debt (and consequently of tax compliance) from the introduced economic recession indicators.

2. In terms of most important explanatory variables, we can observe the average wages in the private sector and the level of unemployment, followed by the industrial production indices, The Slovenian Stock Exchange Index and company incomes. In this respect, we point to both the unemployment rate, which steadily rose during the period of the crisis, and the stagnation of average wages in the private sector.

We also believe that some useful policy implication might be taken into consideration. As such the possibility for less restrictive measures of fiscal policy during times of economic recession (tax enforcement activities, reduced rates of interests for the late payment of taxes, longer periods for filling tax returns, temporary reprieves, and instalment plans) is worth discussing. However, it is necessary to consider the impact of those measures on the income balances of public budgets, where the main source represents taxes and contributions of business subjects. Moreover, some proposed a development of tax compliance strategy for the economic crisis by tax agencies to address the emerging challenges to revenue administration.

Although in the context of Slovenia our study gives the empirical results of the tax debt fluctuations dependence for the first time, we are aware of the limitations of these findings, which derive from the availability of time series data on tax debt and the smaller number of variables used in the model. In our opinion, analysis of mitigatory administrative measures influence on the level of tax compliance during the recession would be meaningful, as well.

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Recesija ir mokestinių prievolių vykdymas: Slovėnijos pavyzdys

Santrauka

Šiame darbe sutelktas dėmesį į viešųjų finansų sritį, kur recesija bei vyriausybės reagavimas į jos pasekmes, turėjo nemažą įtaką kai kurioms makroekonominėms kategorijoms. Valdžios sektoriaus deficitas ir skolos padidėjo, o surenkamos įplaukos sumažėjo. Be to, ekonominė krizė paveikė pagrindinį šiuolaikinės mokesčių sistemos elementą, t. y. mokesčių išieškojimą, todėl padidėjo mokesčių skola. Tai paveikė makroekonominę situaciją plačiau, ypač valdžios sektoriaus skolą. Mokesčių skola parodo nesumokėtų mokestinių įsipareigojimų sumą, dėl ko vėliau sumažėja viešųjų biudžetų pajamų balansas. Tačiau šis faktas gali būti susietas su valdžios sektoriaus skolos suma.

Slovėnijos duomenys rodo, kad neapmokėtų mokestinių įsipareigojimų suma recesijos metu didėja, o surenkamos įplaukos tuo pačiu metu krenta. Todėl 2011 metais mokesčių skolos suma padidėjo iki 0.9 milijardų eurų, o tai yra lygu viešųjų finansų biudžeto deficitui (valstybės biudžetas, municipaliniai biudžetai, Slovėnijos pensijų ir Invalidumo draudimo tarnyba, Slovėnijos Sveikatos draudimo institutas).

Mokesčių vengimo aspektas yra platus. Šiame darbe aptariami mokestiniai įsipareigojimai, kurie pateikiami mokesčių mokėtojų deklaracijose ir kuriuos įrašo mokesčių inspekcija. Tačiau šiuolaikinėje mokesčių sistemoje, šešėlinė ekonomika skatina neteisėtą mokesčių vengimą ir sukčiavimą. Mokesčių mokėtojai nedeklaruoja arba ne viską deklaruoja, todėl mokesčių inspekcija negali įrašyti šių pajamų ir jų kontroliuoti, kad būtų tinkamai sumokami mokestiniai įsipareigojimai.

Tik keletas autorių nagrinėjo mokesčių vykdymo ir verslo ciklo klausimą. Plumley (1996) nagrinėjo skirtingus individualių pajamų mokestinių prievolių vykdymo determinantus Jungtinėse Valstijose ir nustatė, kad nedarbo lygis daro neigiamą įtaką ataskaitų vykdymui. Brondolo (2009) nustatė, kad empiriniai duomenys apie recesijos įtaką mokesčių mokėtojų įsipareigojimų vykdymui yra nesusisteminti, tačiau jais remiantis, galima įžvelgti tam tikro pablogėjimo tikimybę. Cai ir Liu (2009) tyrinėjo, ar rinkos konkurencingumas sustiprina Kinijos pramonės įmonių siekius vengti pelno mokesčio. Jie gavo tikslius ir nuoseklius duomenis, kad įmonės, kurių aplinka yra konkurencinga, dažniau stengiasi išvengti mokesčių. Jie taip pat išsiaiškino, kad vengiant pelno mokesčio, susiduriama su problema gauti kreditą. Schneider (2010) pateikė ataskaitą apie šešėlinės ekonomikos atsiradimą ir jos veiklą Vokietijoje, Graikijoje ir 19 EBPO šalių nuo 1990 metų ir pateikė pirmuosius, preliminarius skaičiavimus 2010 metams, atsižvelgdamas į tebesitęsiančią ekonominę krizę. Pasaulinio masto ekonominės krizės metu, visos EBPO šalys vėl tikėjosi susidurti su atsinaujinusiu šešėlinės ekonomikos masto didėjimu 2010 metais (pirmasis buvo 2009 metais).

Paminėtina tai, kad nemažai autorių tyrinėjo skirtingus rodiklius, kurie galėtų paveikti mokestinių prievolių vykdymą. Ravikumar ir Zhang (2012) tyrė optimalų mokesčių mokėtojų pajamų auditavimą dinaminiame, paslėptų pajamų *pagrindinio agento* modelyje. Kastlunger *ir kt*. (2009) taip pat tyrė skirtingų audito modelių įtaką būsimam įsipareigojimų vykdymui dviejuose eksperimentuose. Muehlbacher *ir kt*. (2011) iškėlė hipotezę, kad savanoriškas įsipareigojimų vykdymas priklauso pirmiausia nuo pasitikėjimo valdžia, o priverstinis įsipareigojimų vykdymas yra tik viena, iš valdžiai suteiktos galios, funkcijų. Ši hipotezė gali būti patvirtinta analizuojant didelę duomenų bazę apie mokesčių mokėtojus iš Austrijos, Jungtinės Karalystės ir Čekijos respublikos. Autoriai taip pat teigia, kad savanoriškas prievolių vykdymas yra teigiamai susietas su amžiumi ir išsilavinimu, o priverstinis prievolių vykdymas yra neigiamai susietas su išsilavinimu.

Lubian ir Zarri (2011) pateikė empirinius įrodymus, kad „mokesčių moralę" t. y. mokesčių mokėtojų vidinė motyvacija mokėti mokesčius, sudaro naujas *laimės determinantas*. Ahmed ir Braithwait (2005) galėjo patvirtinti tezę, kad aukštesnyjį išsilavinimą turinčių mokesčių mokėtojų nepasitenkinimas finansavimu yra svarbus mažinant mokesčius. Kondrad ir Qari (2011) rado tvirtą teigiamą ryšį tarp patriotizmo ir mokestinių prievolių vykdymo. Batrancea *ir kt*. (2012) savo darbe apžvelgė mokestinių įsipareigojimų vykdymo modelius, pabrėždama ekonomines ir elgsenos perspektyvas. Palil ir Mustapha (2011) padarė išvadą, kad savęs vertinimo sistema Malaizijoje, žinios apie mokesčius daro svarbią įtaką mokestinių prievolių vykdymui. Taip pat autoriai išsiaiškino, kad mokestinių prievolių vykdymui daro įtaką žinojimas, jog bus patikrintas. Jakštonytė ir Boguslauskas (2010) atliko mokesčių, reguliuojančių žemės sklypų apmokestinimų tyrimą, lengvatų, mokesčių mokėtojams, atžvilgiu. Raskolnikov (2009) pasiūlė naudoti atskyrimą ir tikslingą priverstinį vykdymą skirtingoms mokesčių mokėtojų grupėms, remiantis mokesčių mokėtojų motyvacija. Hartner *ir kt*. (2010) parodė, kad abi mokestinių prievolių vykdymo formos (t. y. individualių ir bendrų Europos Sąjungos – mokestinių prievolių vykdymas) buvo suvoktos kaip sąžiningumo sprendimai. Alm ir Torgler (2011) teigė, kad mokestinių prievolių vykdymą galima paaiškinti, bent jau iš dalies, įvertinant, (dažniausiai nepaisomą), asmens etikos suvokimą. Verboon ir Dijke (2011) atskleidė procedūrinio sąžiningumo ir sankcijų griežtumo efektyvumo vaidmenį paklūstant valdžiai. Murphy (2005) parodė, kad mėginimai suvaržyti ir grasinti mokesčių mokėtojams, kad jie paklustų, gali pakenkti mokesčių inspekcijos teisėtumui, o tai gali paveikti tolesnį mokesčių mokėtojų įsipareigojimų vykdymo elgesį. Walsh (2012) teigė, kad geresnis mokesčių mokėtojų motyvų ir jų požiūrio bei elgesio mokesčių klausimais supratimas gali pagerinti ir savanorišką prievolių vykdymą, ir mokesčių administravimo efektyvumą. Li-Chen (2008) tiria mokesčių vengimą ir savanorišką indėlį tais atvejais, kai egzistuoja ir viešosios, ir privačios paslaugos. Torgler (2008) teorinėje analizėje pabrėžia standartinių teorijų apie sukčiavimą mokesčių srityje išplėtimo svarbą, kuri yra pagrįsta siaura „atbaidymo koncepcija". Autorius aptarė naujausias tendencijas, kurios pabrėžė socialinių normų ir institucijų svarbą. Kindsfateriene ir Lukaševičius (2008) įrodė, kad mažesni mokesčių įplaukų lygiai sudaro sąlygas išplėsti mokesčių bazę. Dėl šios priežasties biudžeto įplaukos padidėja, o šešėlinės ekonomikos lygis, priešingai, sumažėja

Šiame darbe keliami šie *tyrimo tikslai*:

1. Paaiškinti ekonominės recesijos įtaką mokestinių prievolių vykdymui Slovėnijoje, ypač atsižvelgiant į mokesčių skolos svyravimus. Bandoma nustatyti ryšį tarp kai kurių ekonominės recesijos ir mokesčių skolos determinantų.

2. Nustatyti ekonominės recesijos individualių veiksnių intensyvumą ir įtaką mokestinių prievolių vykdymui, taip pat ir mokesčių skolos sumai.

3. Aptarti kai kuriuos specialius administracinius bandymus sumažinti recesijos įtaką mokestinių prievolių vykdymui.

Tyrimo objektas yra mokesčių skola ir jos svyravimai Slovėnijoje.

Šis darbas pirmą kartą pateikia empirinius rezultatus apie mokesčių skolos svyravimų priklausomybę Slovėnijoje.

Šiame tyrime, kaip prievolės nevykdymo priemonė, buvo panaudoti duomenys apie mokesčių skolą (nesumokėtus mokesčius). Ekonominė recesija, kuri daro įtaką mokestinių prievolių vykdymui, gali būti išreikšta per nedarbo lygį, vidutinį darbo užmokestį privačiame sektoriuje, kompanijos pajamas, Slovėnijos vertybinių popierių biržos indeksą ir pramonės gamybos rodiklius. Remiantis mokesčių skola, svyravimais ir regresijos modelio rezultatais, buvo nustatyta, kad ekonominiai svyravimai labai paveikė mokestinių įsipareigojimų vykdymo lygį. Kaip svarbius paaiškinamuosius kintamuosius mes galime nurodyti vidutinio darbo užmokesčio privačiame sektoriuje svyravimus, taip pat nedarbo lygį, kurie nuolat augo recesijos metu. Taip pat šiame darbe aptarti kai kurie administracijos bandymai sumažinti recesijos įtaką mokestinių prievolių vykdymui.