SELECTED ASPECTS OF FISCAL POLICY IN CENTRAL EUROPE: CASE OF SLOVAKIA

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Abstract

The sustainability of public finances in Slovakia is significantly associated with increasing VAT efficiency and reducing VAT revenue losses. VAT as a major tax revenue source in Slovakia is yielding almost 40 % of total tax revenues, but more than one third of potential VAT is not levied. Discrepancy between the growth of VAT revenues and the growth of its macro-economic base in recent years may imply the existence of tax evasion as well as low efficiency of VAT collection. Since Slovakia becomes a Member of the EU in 2004, the VAT revenue losses almost tripled with its peak in 2012. Due to the measures combating VAT evasion and increasing efficiency of VAT collection, the VAT revenue losses in Slovakia decreased in absolute and relative terms, but still are above the EU average. The aim of the paper is to outline the VAT gap development in Slovakia and identify the statistically significant variables that have an impact on the VAT gap using a simple regression analysis. Based on our analysis, we may conclude that VAT gap share responds negatively to the effective VAT rate and VAT revenue to GDP ratio and positively to the final consumption of households and the size of the shadow economy.

Key words: *sustainability of public finances, VAT efficiency, VAT revenue losses*

INTRODUCTION

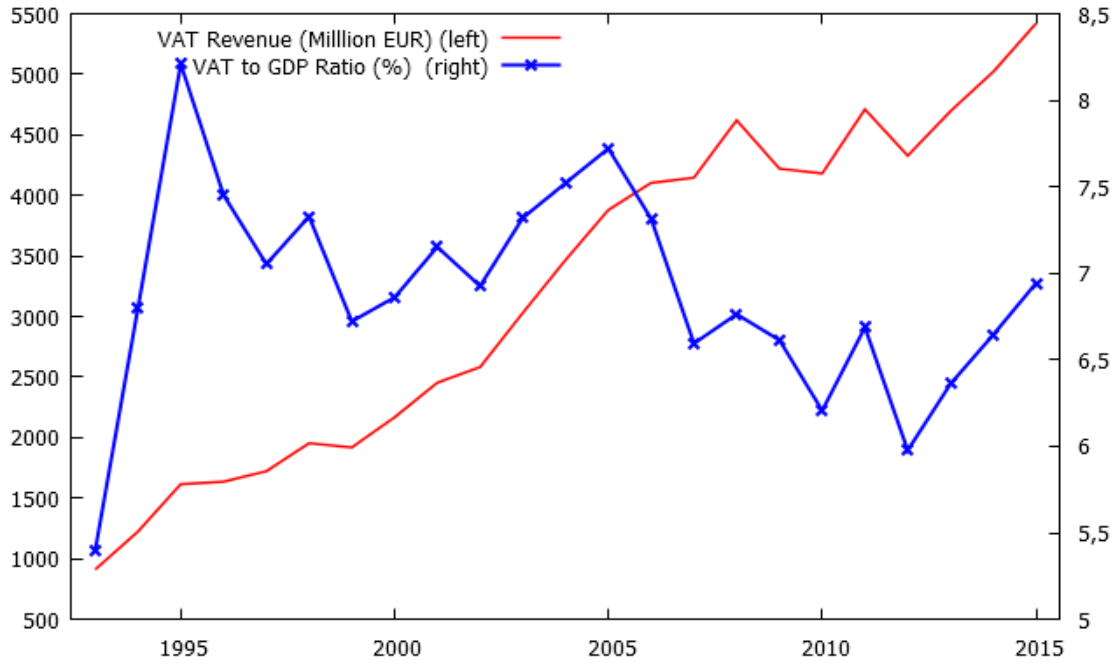
The sustainability of public finances is a difficult task in most EU Member States. The significant role of VAT in the structure of tax revenues and downward pressure on income taxes in the EU raises the need to improve efficiency of VAT system. Increasing VAT efficiency and broadening the VAT tax base through the removal of exemptions and reduced rates currently applied to a wide range of goods and services could substantially help to increase revenues and reduce economic distortions in the EU.

Since its introduction in 1993, the value added tax has become the most important tax revenue source in the Slovak Republic. A development of VAT revenue depends on its macroeconomic base, which is mainly affected by the final consumption of households. The final consumption of households represents the major part of the theoretical tax base on which VAT is levied. VAT imposed on household consumption creates 65 % of the theoretical VAT liability calculated for all EU Member States [CASE 2014].

The tax reform realized in the Slovak Republic on 1st January 2004 included the cancellation of the reduced VAT tax rate and the introduction of the uniform VAT rate in the amount of 19 % for all goods and services. It meant the simplification of the VAT mechanism and the reduction of the administrative burden for tax payers and tax administration. The uniform VAT rate in the amount of 19 % was being applied in the Slovak Republic even after its accession to the EU in May 2004 until the end of 2006. A reduced VAT rate in the amount of 10 % was again introduced on drugs, selected goods and medical devices in 2007. Another reduced VAT rate in the amount of 6 % on so called "yard sale" was applied during 2010.

VAT revenue in Slovakia has been increasing on a year-to-year basis from EUR 0.9 billion to EUR 5.4 billion 2015, except 2009 when there was a sharp decline due to the crisis. The VAT revenue shortfall also occurred in 2012. It was mostly caused by the unfavourable financial situation of business entities, the growth of exports of goods and the related growth of excessive VAT deductions and increasing tax evasion related to VAT. In 2013, VAT revenue showed an upward trend and for the first time exceeded the pre-crisis level. It was associated with the improving economic situation in the country and also the implementation of the Action Plan against Tax Evasion from 2012 (Figure 1).

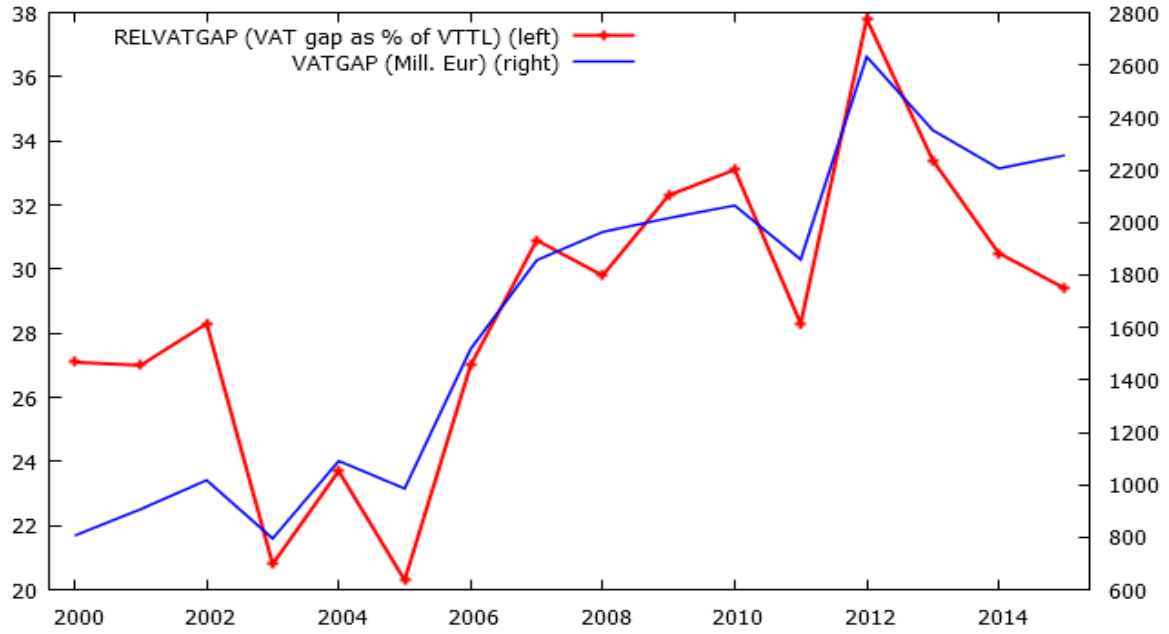
Figure 1. VAT revenue in Slovakia in absolute and relative terms



Note: Own figure; Source: Eurostat (2017)

The economic crisis and anti-crisis measures significantly deepened the level of public deficits in majority of the EU member states after 2009 [Válek & Kušnírová 2014].
The public finance deficit in the Slovak Republic grew from 2.1 % in 2008 to 8.0 % in 2009-2010. The adopted consolidation measures in the volume of EUR 1.2 billion were directed to reduce the public finance deficit under 3 % of GDP in 2013.
In 2011, the standard VAT rate increased from 19 % to 20 % in relation to the measures focused on the reduction of public finance deficit. The increased VAT rate should have been only temporary, while the public finance deficit drops under the level of 3 % of GDP. Despite the fact that the general government deficit declined to 2.8 percent of GDP in 2013, the VAT rate remained at 20 %.
In 2009, the European Commission published the information about the estimated VAT revenue loss in the Slovak Republic for 2006 in the amount of EUR 1.3 billion [Reckon 2009]. The estimated amount of VAT loss was higher than the amount of funds necessary for the consolidation of public finances in the Slovak Republic.
In May 2012, the Slovak government approved "Action Plan against Tax Evasion for 2012-2016". The adopted measures on VAT were aimed at the improvement of VAT collection, the prevention of VAT system misuse and the creation of better conditions for the realisation of legal business activities, e.g. releasing the "List of potentially risky VAT payers" by the Financial Directorate of the Slovak Republic launched in February 2013, the introduction of the electronic VAT control statement in 2014 (it should help the tax administrator to detect and prevent frauds on VAT by automated system of cross control of data) or setting up a specialised team called "Tax Cobra", which uncovers *tax* evasion-related crimes and others. In 2014, the Financial Administration of the Slovak Republic identified the risk VAT in the amount of EUR 200 million by the VAT control statement.
Despite the fact that the Slovak Republic gradually reduces VAT gap, it had the second highest VAT gap among the EU Member States in 2015 [CASE 2017]. Since 2004, VAT revenue losses almost tripled and reached peak in 2012 at the level of EUR 2.6 billion (37.8 % of the theoretical VAT). It is estimated that approximately one third of potential VAT revenue was not collected in the period from 2000 to 2015. Since 2013 the total VAT loss has been gradually decreasing. It fell to 33.4 % of the theoretical VAT (EUR 2.4 billion) in 2013, to 30.5 % (EUR 2.2 billion) in 2014 and to 29.4 % (EUR 2.3 billion) in 2015 (figure 2).

Figure 2. VAT gap in Slovakia (in absolute and relative terms)



Note: own figure; Source: CASE (2013, 2017)

1. LITERATURE REVIEW

Generally, there are three main groups of factors that have an impact on VAT revenue: (i) norms that set VAT tariffs, tax base, object, registration thresholds and other elements of this tax; (ii) factors that describe the economic environment of the country – GDP or the final consumption of households (the size of potential tax base), inflation, unemployment; (iii) tax avoidance and the system of tax administration [Bikas & Rashkauskas 2011]. Due to the fact, that VAT is a consumption tax, VAT revenue primarily depends on the consumption level in the country.

There have been few studies on determinants of VAT revenue losses. Agha and Haughton (1996) calculated and analysed the VAT compliance rates for 17 OECD countries in 1987 using ordinary least squares (OLS) cross-country regression. They found out that (i) a higher VAT rate is associated with lower VAT compliance; (ii) the number of VAT rates negatively affects the level of VAT compliance; (iii) VAT compliance increases the longer has been the VAT in operation; (iv) smaller countries (in terms of population) tend to have higher level of compliance.

Christie and Holzner (2006) analysed data for 29 European countries from 2000 to 2003 by the means of panel regression using the fixed effects. They found that: (i) higher weighed average VAT rate reduces VAT compliance; (ii) greater judicial and legal effectiveness increases VAT compliance; (iii) countries where citizens want more power for local authorities (which is proxy for tax morale) tend to have lower level of VAT compliance.

The first study, which quantified VAT revenue losses in the EU, was published in 2009 [Reckon 2009]. The VAT revenue losses were estimated through the "VAT gap" indicator, which can be defined as the difference between the amount of VAT actually collected and the theoretical VAT total tax liability derived from general economic data. The VAT total tax liability (VTTL) is an estimated amount of VAT that is theoretically collectable on the VAT legislation. The VAT gap might include VAT not paid as a result of legitimate tax avoidance measures as well as VAT that is not collected due to the insolvency. Reckon study (2009) calculated and analysed data for 24 EU-countries from 2000 to 2006. The authors used the panel regression with random effect and number of explanatory variables to determine VAT gap such as the standard VAT rate, corruption perception index, GDP (size of the economy), unemployment rate, population, Gini coefficient etc., but only corruption perception index showed significant negative impact on the VAT gap. They found out that a lower perception of corruption appears to reduce the VAT gap share (an increase in the Corruption Perception Index coincides with a reduction in the VAT gap share).

CASE study (2013) prepared for the European Commission calculated VAT gap for 26 EU-countries from 2000 to 2011. The authors focused on the influence of the business cycle and VAT rate. The results confirmed that: (i) higher unemployment increases VAT gap (during the recession it rises); (ii) higher VAT rate is associated with higher VAT gap but only in countries with low level of tax collection and tax morale.

CASE (2014) provides estimation of the VAT gap in the EU-26 in 2012 and includes updated figures for the period 2009-2011. This study was updated by CASE (2015), where the figures for 2013 were calculated and estimations of the VAT gap for 2009 to 2012 were revised due to the improved methodology. The updated study CASE (2016) provides figures for the year 2014 as well as revised estimations for the years 2010-2013 due to the transmission of Eurostat national accounts from the ESA95 to the ESA10. The updated study CASE (2017) provides figures for the year 2015 as well as updated estimates for the years 2011-2014 and first estimates of VAT gap for Cyprus.

There have also been few estimates of the VAT gap for specific country, such as the United Kingdom [HMRC 2010], Sweden [Swedish National Tax Agency 2008], Slovakia [IFP 2012], Italy [D'Agosto et al. 2014] and others.

The Institute for Financial Policy of the Ministry of Finance of the Slovak Republic published the study [IFP 2012] which summarizes the estimations of the total VAT revenue loss in 2000-2010 and the VAT gap in 2005-2010 in the Slovak Republic. While the total VAT revenue loss represented 18.2 % of the theoretical VAT, i. e. EUR 861 million in 2005, it reached 35.9 % of the theoretical VAT, i.e. EUR 2.3 billion in 2010. D'Agosto et al. (2014) analysed factors influencing the VAT gap in Italy from 2007 to 2010.

2. METHODOLOGY

A dependent variable for an econometric analysis is the VAT gap share (RELVATGAP), defined as the VAT gap divided by the theoretical VAT liability (VTTL). Data for this variable come from CASE (2013-2017). Candidate explanatory

variables were selected on the basis of the results found in the literature reviewed in Reckon study (2009) and in Zídková and Pavel (2016).
The analyzed data are obtained from Eurostat (National Accounts), Transparency International or European Commission (table 1). The period of years monitored is from 2000 to 2015.

Table 1. Explanatory variables

	Key factor represented by variable	**Expected relationship with VAT gap**	**Source of data**
Final consumption of households (FCONSUM)	Size of potential VAT base	Increases	Eurostat
Size of the shadow economy (SHADECON)	Significance of shadow economy	Increases	Schneider (2015)
Unemployment (UNEM)	Business cycle and income inequality	Increases	Eurostat
Corruption perception index (CPI)	Level of corruption of public sector	Decreases	Transparency International
VAT revenue to GDP ratio (VATREV_GDP)	VAT burden (Tax quota)	Increases	Eurostat
Standard VAT rate (STVATRATE)	VAT burden	Increases	European Commision (VAT rates in EU)
Effective VAT rate (EFVATRATE)	VAT burden	Decreases	Eurostat
Difference between standard and reduced VAT rate (diffVATRATE)	Complexity of VAT system	Increases	European Commision (VAT rates in EU)

Source: According to Reckon (2009) and Zídková & Pavel (2016).

All variables are in relative terms (%), except the final consumption of households, the size of the shadow economy and the corruption perception index (scale from 0 - highly corrupt to 10 - perfectly clean). The effective VAT rate is expressed in % as a share of the VAT revenue and final consumption of households. Descriptive statistics of all variables are in table 2.

Table 2. Descriptive statistics of dependent and explanatory variables in 2000-2015

	Average	Minimum	Maximum
VAT gap share (% of VTTL)	0.287	0.203	0.378
Final consumption of households (million of EUR)	32,468.5	17,291.6	42,468.6
Size of the shadow economy (million of EUR)	9,470.0	5,973.0	11,099.0
Unemployment (%)	0.147	0.096	0.192
Corruption perception index (scale from 0 to 10)	4.36	3.50	5.1
VAT revenue to GDP ratio (%)	0.07	0.06	0.08
Standard VAT rate (%)	20.13	19.0	23.0
Effective VAT rate (%)	12.28	10.6	13.9
Difference between standard and reduced VAT rate (%)	12.06	6.0	19.0

Source: Own calculation in GRETL

The starting point of the analysis was to estimate correlation coefficients between dependent variable and each of explanatory variables using Excel statistical function for correlation.
A simple linear regression model in GRETL was estimated for each explanatory variable. The regression coefficients were estimated by the method of ordinary least squares (OLS). F-test and t-test were used to confirm the significance of particular simple linear regression model and its parameters.

3. RESULTS

The Pearson correlation coefficient was calculated for each pair of variables, because it can indicate a predictive linear relationship between 2 variables that can be exploited in practice (table 3). If the correlation coefficient values are closer to -1 (1), there is the higher negative (positive) tightness of the time series examined.

Table 3. The values of the correlation coefficients (R) for the selected variables

	RELATVATGAP	Relationship
EFVATRATE	-0.922	negative (S)
STVATRATE	-0.072	no or negligible (W)
diffVATRATE	-0.436	negative (M)
VATREV_GDP	-0.936	negative (S)
FCONSUM	0.648	positive (S)
UNEM	-0.469	negative (M)
SHADECON	0.600	positive (S)
CPI	0.476	positive (M)

Note: S – strong, M – moderate, W – weak
Source: own calculations

There appears to be a strong relationship between the VAT gap share and these explanatory variables: the effective VAT rate (R = -0.922), the VAT revenue to GDP ratio (R = -0.936), the final consumption of households (R = 0.648) and the size of the shadow economy (R = 0.600).
A moderate relationship appears to be between the VAT gap share and the unemployment (R = -0.469), the VAT gap share and the corruption perception index (R = 0.476) and the VAT gap share and the difference between the standard and reduced VAT rate (R = -0.436). No linear relationship or very weak appears to be between the VAT gap share and the standard VAT rate (R = -0.072).
The simple linear regression models in GRETL were estimated for each explanatory variable by ordinary least squares (OLS). The compiled results are in summary table 4.

Table 4. Results of simple regression models

	Dependent variable: RELVATGAP (VAT gap share - % of VTTL) Model: OLS, using observations for the period 2000-2015 (T=16)			
	Coefficient	**Equation – simple regression model**	**R^2**	**P-value (F)**
Model 1	const 83.7208 *** EFVATRATE −4.47752***	^RELVATGAP = 83.7 – 4.48*EFVATRATE (6.18) (0.502)	0.850	3.75e-07
Model 2	const 90.5668 *** VATREV_GDP 9.0188 ***	^RELVATGAP = 90.6 – 9.02*VATREVGDP (6.22) (0.905)	0.876	9.73e-08
Model 3	const 17.8696*** FCONSUM 0.0003345***	^RELVATGAP = 17.9 + 0.000335*FC (3.53) (0.000105)	0.420	0.006631
Model 4	const 14.5553 ** SHADECON 0.001496 **	^RELVATGAP = 14.6 + 0.0015*SHADECON (5.14) (0.000533)	0.360	0.013953
Model 5	const 39.8674 *** UNEM −0.7585 *	^RELVATGAP = 39.9 – 0.759*UNEM (5.31) (0.355)	0.246	0.050853
Model 6	const 10.9862 CPI 4.0734*	^RELVATGAP = 11.0 + 4.07*CPI (8.83) (2.01)	0.226	0.062458
Model 7	const 35.0249 *** diffVATRATE −0.5217 *	^RELVATGAP = 35.0 – 0.522*diffVATRATE (3.63) (0.288)	0.190	0.091416
Model 8	const 33.1215 * STVATRATE −0.2181	^RELVATGAP = 33.1 – 0.218*STVATRATE (16.4) (0.813)	0.005	0.792265

Note: Significance of coefficients: *p-value < 0.1; **p-value < 0.05; ***p-value < 0.01.
Coefficient without * - variable is not significant. Standard errors are in parentheses.
Source: Own calculations in GRETL

The F-test results of overall significance confirmed the statistical significance of regression models 1, 2, 3 and 4 at the 5 % significance level. This conclusion was also confirmed by the probability P-value (F) of particular models, which is less than 0.05. T-test results confirmed the statistical significance of individual parameters (coefficients) in these models.
The regression models 5, 6 and 7 are statistically significant at the 10 % significance level. The coefficients of determination (R^2) are low, which suggests that unemployment, the corruption perception index (CPI) and the difference between the standard and the reduced VAT rate have only a negligible impact on the VAT gap share. The regression model 8 is not statistically significant, which is confirmed by F-test results and the P-value (F) of the model (0.7922). The estimated coefficient of explanatory variable in model 8 is not statistically significant as well. Coefficient of determination is close to zero (0.005), which suggests that the standard tax rate does not affect the VAT gap share in Slovakia.

CONCLUSION

The sustainability of public finances is a major challenge for many countries including Slovakia. The 2009 global financial and economic crisis, together with measures of fiscal policy adopted in the EU countries, had a strong impact on the level of tax revenues. Recovery of the global economy required a lot of financial resources. The governments adopted strategies to get out of recession and stimulate their economies. Several Member States (e.g. Slovakia, Hungary, Czech Republic, Finland, Spain, Portugal, Greece, Great Britain or Poland) increased the standard VAT rates to improve fiscal (budget) situation. But without reassessing the effectiveness of existing tax systems and reducing tax fraud and evasion, especially in the area of VAT, Member States will not be able to increase tax revenues and ensure the long-term sustainability of public finances.
Slovakia, as well as other Member States has to face the increasing volume of tax evasion and fraud, particularly in the field of VAT. The size of tax evasion reflects the efficiency of the tax system and directly affects the economic policy of the government and the long-term sustainability of public finances.
From the results of particular linear regression models it can be concluded that VAT gap share in Slovakia is influenced mainly by the effective VAT rate, VAT revenue to GDP ratio, final consumption of households and the size of the shadow economy. Other factors such as unemployment, the corruption perception index (CPI) and the difference between the standard and the reduced VAT rate have only a negligible impact on the VAT gap share in Slovakia.
The expected relationship with VAT gap (see table 1) was confirmed in the case of effective VAT rate (model 1), final consumption of households (model 3) and the size of shadow economy (model 4). The expected relationship between VAT gap share and VAT revenue to GDP ratio was not confirmed.
The comparison of actual VAT revenue and the estimated VAT revenue loss in Slovakia shows that approximately one third of potential VAT revenue is not collected. Despite the adopted measures focused on the efficient tax collection and elimination of VAT evasion, Slovakia loses approximately EUR 2.2 billion annually. A serious problem is the inability of the Financial Administration to enforce

additional VAT levy based on the tax audits and the lack of payment discipline of the taxpayers.
The application of (general) reverse charge mechanism on domestic transaction, elimination of exemptions and broadening tax base should help tackle VAT fraud and evasion. The expected change of the VAT system at the EU level could partially strengthen the resistance of the VAT system against tax evasion and eliminate VAT revenue loss in Slovakia.

ACKNOWLEDGEMENT

This contribution presents some results from the research project VEGA No. 1/0443/15 entitled „The tax policy and its impact on the tax collection efficiency and the elimination of tax evasion“.

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