A VAR Analysis Regarding Tax Evasion and Tax Pressure in Romania

Boștină Florin
West University of Timisoara,
Doctoral School of the Faculty of Economics and Business Administration
florinbostina_bif@yahoo.com

Abstract

The tax burden is viewed, in both empirical and theoretical studies, as the main determinant of tax evasion and the shadow economy. There is an increasing fiscal pressure which suggest that taxpayers are affected by a stable over-burden of fiscal pressure due to tax evasion. Furthermore, the stability of the overburden gap could be considered a signal of the absence of a vicious circle between tax evasion and tax rates, through tax base erosion.

The main aim of the paper is to identify the relationship that exists between tax evasion and tax pressure in Romania, between 2000 and 2013, using an autoregressive vector type of analysis. The VAR model with 3 lags can be considered as representative in order to describe autoregressive links between tax evasion and fiscal pressure in Romania.

1. Introduction

The economic and financial crisis in the EU has extremely unfavorable budgetary and social consequences in the Member States. According to the European Commission (2013), it is essential that in this context: "the public finance must be revised in order to support the social protection systems and public utilities, in order to restrict the refinancing costs borne by the state and by other public authorities, as well as in order to avoid the negative impact of contagion on the rest of the economy. By reducing the tax fraud and tax evasion, Member States can boost their revenues obtained from tax increment. It will provide them with a greater room of maneuver in order to restructure their tax systems in such a way to promote the sustainable economic growth more efficiently. At the same time, reducing the tax fraud and tax evasion may support the Member States' efforts, aimed to ease the fiscal burden on the people on a low-income and on the most vulnerable groups."

For the assessment of the tax burden on tax evasion, empirical findings highlight two economic issues. On the one hand, there is an increasing fiscal pressure in long run with high volatility of tax base concealment. Despite the time varying behavior, one can notice the constant gap between apparent and effective tax rate. This suggest that taxpayers are affected by a stable over-burden of fiscal pressure due to tax evasion (Chiarini et al., 2013). On the other hand, is the catchy interaction between tax evasion and tax rates, through tax base erosion. This issue is becoming more concerning in the cases of high public debt and deficit spending, as is for Romania too. Therefore, the stability of the overburden gap could be considered a signal of the absence of such a vicious circle (Bernasconi and Lapecorella, 2007).

The main aim of the paper is to identify the relationship that exists between tax evasion and tax pressure in Romania, between 2000 and 2013, using an autoregressive vector type of analysis. The VAR model with 3 lags can be considered as representative in order to describe autoregressive links between tax evasion and fiscal pressure in Romania.

The remainder of the paper is consist as follows. Next section briefly discuss the literature review with a focus on the latest developments of tax evasion in Romania. In section 3 are presented the methodology and data used to test the empirical VAR model. Section 4 report the

results for VAR estimations as well as impulse functions and Section 5 concludes.

2. Literature review

According to the Fiscal Council calculations based on the INS data, tax evasion has an extremely high rate in Romania, representing 16,2% of the GDP, in 2013. If Romania achieved a higher degree of tax collection of 100%, then its budgetary revenues, as percentage of the GDP, would exceed the European average, as long as the legal level (statutory) of the main charges and taxes in Romania is higher than the European average (at the European level, Romania has the third highest standard VAT rate and the seventh heaviest fiscal burden on the labor market – mostly generated by CAS (the health insurance home); at the same time, Romania has one of the lowest legal rate of taxation on profits and personal revenue in the EU, however they weigh less in the budgetary revenues). A thorough reform of the charges and taxes administration, targeted at the tax collection rate growth is absolutely necessary and might create the fiscal space necessary to reduce the fiscal burden on employment, which currently has a very high level.

Most of the tax evasion is centered on VAT (75%); the maximum level was experienced in 2012, 12,34% of the GDP respectively. An important aspect is that the standard VAT rate rise to 24%, in 2010, generated a tax evasion rise at VAT, from 8% of the GDP in 2009, to 9,6% of the GDP in 2010. This growing trend has also been maintained in the following years.

Of the total tax evasion, an approximate percentage of 15% is represented by social security contributions, mainly owing to the "undeclared work". In 2012, there were approximately 1.570.000 employees, employers and individual entrepreneurs in Romania, unregistered off the books, representing approximately 27,7% of the total employees, employers and individual entrepreneurs in the economy (Consiliul Fiscal, Raportul anual pe 2013).

Fisman and Wei (2004) quantified the effect of tax rates (in the case of customs duties) on tax evasion, examining the difference between Chinese exports to Honk Kong and Hong Kong imports declared in China: an increase in the tax rate by 1 percentage is associated with an increase in tax evasion by 3 percent. Moreover, the magnitude of tax evasion is strongly correlated with different tax rates for relatively similar products, suggesting that tax evasion takes place to a great extent by misleadingly declaring imports of goods in the categories for which high tax rates are used, falling into less harsh taxed categories.

The beneficial effect of tax cuts on tax evasion was highlighted in a study (Papp and Takats, 2008) conducted on the case of Russia, based on the idea that the reduction in taxation determines the diminishing of the taxpayer's motivation to hide the taxable matter and, as a consequence, an increase in tax revenues too. In the case of the USA, Slemrod (2007) calculated a tax non-compliance rate of 14% for the total federal tax and income tax.

Several empirical studies indirectly related to tax evasion are those that take into account the relationship between taxation and the underground economy. Davis and Henrekson (2004) have identified the conditions under which regressions by group of countries may highlight, among other things, the impact of taxation on the size of the underground economy. Using data from the last decade of the last century for a sample of developed countries, the two authors pointed out that an increase in the general tax rate by 12.8 percentage points leads to an increase in the underground economy by 3.8 percent of the GDP.

Another study assessing the impact of taxation on the size of the underground economy is represented by Peter (2009). It analyzes the effects of a tax reform aimed at moving to a proportional income tax or just a reduction in progress on the underground economy on a sample of 170 countries for a 25-year analysis period. The obtained results indicate that there is a direct positive relationship between income tax rates, progressive taxation and the complexity of income tax on the one hand and the size of the underground economy on the other. Introducing proportionally income taxation is likely to reduce the size of the underground economy in the short term, but the effect diminishes and disappears over the long term.

3. Methodology and data

In the empirical part, we perform an autoregressive vector type of analysis (AVT), in order to identify the relationship that exists between tax evasion and tax pressure, in Romania, in between 2000-2013.

The autoregressive vector type methodology (AVT) is a method used in the time series analysis, especially due to its flexibility and easy maneuver. In the case of this methodology, the dependent variables (resultatives) are lags of the explicative variables, but also of the simultaneous equations, because it simultaneously estimates a system of equations. Moreover, in each equation there are lags included from the other endogenous variables (Asteriou and Hall, 2011).

In order to check if there is a connection between tax evasion (EVAZ), and tax pressure (TP), we have taken into account the following hypothesis:

$$H_1: EVAZ = f(TP) \qquad (1)$$
$$H_1: TP = f(EVAZ) \qquad (2)$$

The demonstration will be made with the help of an AVT model, which can be written under the form of the following equations:

$$EVAZ_t = \alpha_1 + \sum_{j=1}^{k} \beta_j \times EVAZ_{t-j} + \sum_{j=1}^{k} \gamma_j \times TP_{t-j} + \varepsilon_{1t}, \qquad (3)$$
$$TP_t = \alpha_2 + \sum_{j=1}^{k} \delta_j \times TP_{t-j} + \sum_{j=1}^{k} \theta_j \times EVAZ_{t-j} + \varepsilon_{2t}, \qquad (4)$$

where α_1 and α_2 are coefficients of the free terms; $\beta_j, \gamma_j, \delta_j, \theta_j$ are coefficients of the endogenous variables, and ε represents the residual errors.

In terms of methodology, the main steps of econometric analysis are:

- Applying stationary tests;
- Verification of the Granger causality from considered variables;
- Selection of VAR model and
- Checking the stability condition of the model;
- Identification of impulse functions.

4. Results

In the case of the studied variables, the stationarity on levels of the series was first tested, with the help of ADF tests (Augmented Dickey-Fuller) and PP (Phillips-Perron), resulting that time series are not stationary, or, in other words, have a unitary root. Thus, 1st order differentiations of series have undergone this, and the results indicate the fact that these integrated 1st order series are stationary (do not represent a unitary root or are I(1)).

The Pairwise Granger causality test suggests (for lag = 1) the fact that we can accept the null hypothesis in both cases, which means that tax evasion does not cause Granger fiscal pressure in Romania, and the other way around.

For the lag selection, the "VAR Lag Order Selection Criteria" test was considered, which shows the fact that, for 3 theoretical lags, four out of five criteria (FPE, AIC, SC and HQ) recommend a lag equal to 3 for the VAR model "EVAS-PRESSURE".

Given that VAR meets the stability condition too, the VAR estimations are reported in table no. 1

Table no. 1 Unrestricted autoregressive vector EVAS-PRESSURE" estimations

Autoregression vector estimations
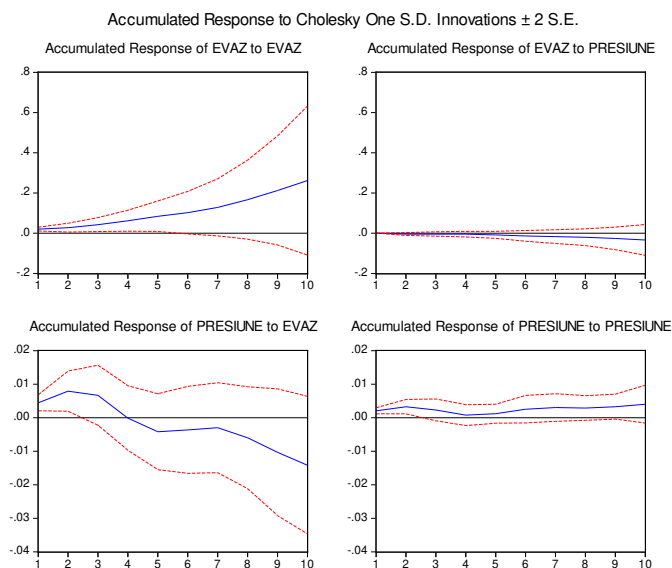Standard errors in ( ) and t-statistical [ ]

	EVAS	PRESSURE
EVAS(-1)	0.777379	0.041567
	(0.43014)	(0.10291)
	[1.80725]	[0.40393]
EVAS(-2)	0.234068	-0.014118
	(0.47905)	(0.11461)
	[0.48861]	[-0.12319]

EVAS(-3)	0.201027	-0.184173
	(0.62097)	(0.14856)
	[0.32373]	[-1.23974]
PRESSURE(-1)	-1.970576	0.589199
	(1.59310)	(0.38113)
	[-1.23694]	[1.54594]
PRESSURE(-2)	2.645560	-0.736393
	(1.76224)	(0.42159)
	[1.50125]	[-1.74669]
PRESSURE(-3)	-2.242771	-0.068907
	(1.29791)	(0.31051)
	[-1.72799]	[-0.22192]
C	0.441787	0.360491
	(0.46141)	(0.11039)
	[0.95747]	[3.26573]
R-squared	0.893441	0.840399
F-statistical	4.192223	2.632806
Log likelihood	30.74501	45.04805
Akaike AIC	-4.749002	-7.609609
Schwarz SC	-4.537192	-7.397800

Source: own processing with Eviews 6

Thus, the VAR "EVAS-PRESSURE" model can be considered as representative in order to describe autoregressive links between tax evasion and fiscal pressure in Romania. Based on these results, we can identify two impulse answers (represented in the Figure no. 1), which evaluates the effect of a shock upon current or future values variation of variables EVAS and PRESSURE.

Figure no. 1. Impulse functions

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

Source: own processing with Eviews 6

Several remarks could be drawn up. First, a +1% shock in the level of fiscal pressure (upper-right graphic) does not generate almost any effect upon the tax evasion in Romania in the first 5 years of the forecast. In the following 5 years, the same positive shock of the fiscal pressure can be observed to determine a slight decrease in tax evasion, so the link between the two variables will become negative. Second, a +1% shock in the level of tax evasion (lower-left graphic) will generate a slight growth of tax evasion in the first 4 years taken into consideration, after which the trend reverses, maintaining itself for all the remaining 6 years left in the forecast period.

5. Conclusions

Improving the fiscal administration is a hard task for a third of the Member States owing to the action of various factors, including: high administrative costs related to the net revenue collection; not using the information provided by third parties for pre-filling the self-assessment tax returns; using only to a small extent the electronic forms; and, finally, the considerable administrative burden on the medium sized businesses, generated by fiscal systems (European Commission, 2013).

At a national level, in the context of the European Semester, Member States must apply the specific recommendations made by the European Commission in order to improve the fiscal governance. Among the measures aimed to improve compliance with fiscal rules and the promotion of some more efficient fiscal administrations, there are (European Commission, 2013):

• "developing a compliance strategy and focusing the efforts on combating tax evasion;
• Making more use of the information provided by third parties;
• Developing pre-filled self-assessment tax returns;
• Making concerted efforts in order to downsize shadow economy, such as applying criminal sanctions for those hiring undocumented workers, using electronic means of payment, mandatory in the case of purchases exceeding a certain threshold, or using monetary incentives for revenue declaration (tax cuts)."

Member States must take into consideration and apply the Commission recommendations, concerning tax havens and aggressive tax planning, which mainly refer to identifying third countries which are not applying the minimum standards for a proper fiscal governance. The Commission is willing to provide specific support and technical assistance to any Member State which requests it in order to strengthen their fiscal system against tax evasion and in order to improve tax collection.

6. References

• Asteriou, D.; Hall, S. G., 2011, *Applied Econometrics* (Second ed.). London: Palgrave MacMillan. pp. 319–333.
• Bernasconi, M., Lapecorella, F., 2007, I condoni nel sistema tributario italiano. In M. C. Guerra & A. Zanardi (Eds.), *La Finanza Pubblica Italiana*, Rapporto 2006. Il Mulino Bologna.
• Chiarini B., Marzano E., Schneider F., 2013, Tax Rates and Tax Evasion: An Empirical Analysis of the Structural Aspects and Long-Run Characteristics in Italy, *European Journal of Law and Economics,* 35:273-293.
• Fisman R., Wei S.-J., 2004, Tax Rates and Tax Evasion: Evidence from "Missing Imports" in China, *Journal of Political Economy*, vol. 112, no. 2.
• Papp T. K., Takats E., 2008, Tax Rate Cuts and Tax Compliance - The Laffer Curve Revisited, *IMF Working Paper*, 07.
• Peter K. S., 2009, Income Tax Flattening: Does it Help Reduce the Shadow Economy?, *Andrew Young School of Policy Studies Research Paper Series*, Working Paper, 08, 2009.
• Slemrod, J., 2007, Cheating Ourselves: The Economics of Tax Evasion, *Journal of Economic Perspectives*, 21(1):25–48.
• ***, Comisia Europeană (2013), Combaterea fraudei și a evaziunii fiscale, Contribuția Comisiei la reuniunea Consiliului European din data de 22 mai 2013, available online at:http://europa.eu/rapid/press-release_IP-12-697_ro.htm?locale=en
• ***, Consiliul Fiscal (2014), Raportul anual pe 2013, available online at http://www.consiliulfiscal.ro/ra-2013.pdf.