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FISCAL EFFICIENCY OF VAT IN EU MEMBER STATES

Adam Adamczyk

University of Szczecin, Poland. Email: adam.adamczyk@wneiz.pl

Abstract

Value added tax (VAT) in the countries of European Union is one of the most important sources of tax revenues. During the recent financial crisis, the importance of this tax has increased significantly. Despite of the fact that VAT is the best harmonized tax in the EU, the construction of VAT in member states may significantly differ. The differences may relate to issues such as the number and the level of applicable tax rates and the range of goods and services covered by the preferential VAT rates. The aim of the article is to evaluate the functioning of VAT in the EU member states. The evaluation will be carried out with the use of the synthetic measure of development. The criteria for evaluation will be provided by performance parameters such as VAT revenue ratio (VRR) and the relation of VAT revenues to GDP. The carried out analysis will specify in which VAT works best. It will be also possible to identify the factors that determine the fiscal efficiency of this tax.

Keywords: VAT, Efficiency, Policy Gap, Non-Compliance Gap

1. Introduction

A few years ago the problem of tax harmonization in EU countries was one of the most crucial economic issues of the EU. The significance of the problem increased in connection with the introduction of the four basic liberties essential for the creation of the common European market: free movement of services, goods, persons and capital. The biggest significance was attributed to tax unification by means of indirect taxes, because these taxes could have had the strongest influence on the competitiveness of individual EU economies.

Despite the fact that VAT is the best harmonized tax in the EU, certain differences in the construction of this tax are permitted. The differences concern tax rates and the range of goods and services covered by preferential tax regulation. Thus, the question arises whether the mentioned differences in the construction of VAT affect significantly the functioning of this levy, and especially its effectiveness. The answer to the question whether VAT effectiveness is determined by its construction or the factors beyond the tax system is of particular significance. The solution to this problem requires a detailed analysis. VAT effectiveness is a derivative of at least two phenomena: the so called policy gap consisting in partial loss of tax revenue by the state due to the application of tax preferences, and the noncompliance gap resulting from tax offences. Both, the policy gap and the noncompliance gap affect negatively the effectiveness of VAT. On the understanding that these phenomena are unrelated, the problem whether to apply or not to apply tax preferences with regard to VAT would be easy to solve. In order to reduce the negative impact of the policy gap on VAT effectiveness tax preferences should be cancelled. Nevertheless, there are some indications that applying preferences in the scope of VAT, from the point of view of effectiveness of this tax, can also induce some positive effects favorable for limiting the noncompliance gap. Therefore, the consequences of limiting tax

preferences are not easy to determine. The impact of changes on the effectiveness of VAT taxation in the scope of preferences will depend on the scale of phenomena of the policy and noncompliance gaps, and on the effect of the policy gap on the noncompliance gap. Therefore, the purpose of the article is to answer the question whether the policy gap affects the size of the noncompliance gap and if so, whether applying preferences in the scope of VAT affects its effectiveness.

2. VAT Construction and Its Effectiveness

The problem of the influence of the construction of VAT on its effectiveness was not previously the focus of attention of researchers studying the taxation. Analyzing VAT construction, scientists usually focus on the influence of this burden on the whole economy. Particular attention is paid to the problem of the effect of tax base size and the amount of tax rates on the functioning of the market mechanism. Economists doing research on public finance are often of the opinion that the broad-based turnover taxes (sales) have an advantage over the narrow-based taxes and high tax rates. This opinion results from the belief that the single rate taxes imposed on a broad tax base limit the disturbances in operating the market mechanism in the goods market, and favor the limitation of imbalance concerning labor supply.

Generally, tax reforms consisting in broadening the tax base are treated as reforms directed at the support of economic growth, because according to decision-makers they limit distortions of economic decisions concerning labor, savings, investments and consumption. These reforms should increase production and improve social welfare.

A narrow-based sales tax is expected to cause greater distortion in consumption than the one induced by a more broad-based sales tax. In essence, a narrow-based indirect tax would signify the substitution effect in consumption, and hence provides distorted signals to suppliers. Jenkins and Shukla (1999) provide an analytical framework applied to a simplified two-good world. Moreover, economic analyses imply that the preferences used in the construction of VAT are usually not pointed at tax-payers who need it most and, at the same time, their usage causes additional administrative costs and collection costs (compliance costs).

Yet, the arguments for the usage of tax preferences can be indicated. Literature on the optimal taxation of goods implies that non-uniform tax rates can be optimal in a situation when variously taxed goods are substitutable in terms of free time. There are studies according to which the implementation of uniform taxation of goods can be non-optimal in a situation when tax-payers are able to produce such goods with own means or when there exists a considerable informal sector of economy.

The examination of VAT effectiveness is normally conducted with distinguishing the analysis of the policy gap and the compliance gap phenomena. In the case of the policy gap, its relation to VAT construction is obvious – the more extensive is the system of preferences, the bigger is the policy gap, and at the same time tax effectiveness is lower. Examining the second component of VAT effectiveness noncompliance gap, factors beyond the tax system as well as tax construction elements are taken into consideration. In accordance with the neoclassical noncompliance gap theory created by Allingham and Sandmo (1972), the gap size is influenced bysuch factors as tax rates, the level of sanctions (punishment) for tax evasion, probability of fiscal control (Allingham and Sandmo, 1972). According to the behavioral noncompliance gap theory, the tendency to pay taxes may be influenced by such factors as subjective perception of fiscal control probability (Dhami and Al-Nowaihi, 2007) the presence of positive stimuli for paying taxes (Alm, 2013, Feld and Frey, 2002), social norms (Bobek, 2007) or psychological costs (Hashmizade *et al.* 2013). It follows from the research concerning the size of the noncompliance gap with regard to VAT that such factors as weighted average tax rate, law system effectiveness, the sense of taxation justice among tax-payers, etc. affect its size. Among the mentioned determinants of the noncompliance gap, apart from the tax rate, no other elements of tax technique, such as tax reductions or exemptions are taken into account. From the above quoted study by Piggot and Whalley (1998) it follows that applying preferential rates in the cases in which the risk of tax evasion is particularly high may help to limit the

noncompliance gap. Therefore, there are grounds to expect that there will be a negative relation between the size of the noncompliance gap and the policy gap.

3. Measuring VAT Effectiveness

The simplest measure of VAT effectiveness – is its efficiency determined as a relation of incomes on account of this tax to its standard rate. Another, more general measure of VAT effectiveness, is the relation of VAT revenues to GDP. The unquestionable advantage of this measure is good availability of essential data for its determination. A strong side of the relation of VAT revenue to GDP as a measure of effectiveness is also its synthetic character. On the other hand, parameters from beyond the tax system, such as, for example, aggregate demand structure, influence the value of this measure. VAT Revenue Ratio (VRR), a measure of VAT effectiveness currently most often used in literature, is a more sophisticated indicator. The value of this measure is usually determined as a relation of real tax revenue to revenue that would be obtained if all goods and services were taxed with the basic VAT rate and all public tax claims would be fully collected. This measure possesses three significant advantages – it is easy to determine on the basis of readily available data; it constitutes a clear and visible point of reference; and it can be decomposed into many useful ways.

VRR is also burdened with several flaws. For example, for its determination it is assumed that taxation of all goods and services with the standard rate would not cause the change the volume and pattern of consumption. The second flaw stems from the assumption that the consumption determined for the needs of national accounts coincides exactly with the VAT base. Determining the appropriate consumption category used for calculation is also a problem.

As already mentioned, VRR can be decomposed, thanks to which it is possible to specify the reasons due to which actually obtained tax revenue is lower than the potential one. It is usually caused by tax-payers not obeying tax law, that is by the existence of the above mentioned noncompliance gap. The second cause, for which VAT revenue is lower than the potential one, is applying by tax regulators tax preferences which make up the so called policy gap.

4. Synthetic Measure of VAT Effectiveness

VRR method enables comparing VAT efficiency of various states with the assumption that the fiscal meaning of this tax is similar in the compared tax systems. However, in the case of EU states, despite the considerable degree of harmonization, this tax generates revenues that are substantially diversified. While in Denmark VAT revenue reaches 10% of GDP, in Spain this relation is only 5.5%. Such considerable diversification may cause that in countries with high share of VAT revenue to GDP, the level of efficiency measured by means of VRR can be naturally lower due to the effect described by the Laffer curve. Besides, high VAT burden can affect consumption pattern, encouraging tax-payers to buy goods taxed with lower VAT rates. These phenomena can significantly distort the results of analyses concerning the influence of VAT pattern on its effectiveness. To limit the influence of deficiencies of the VAT effectiveness measure, a synthetic measure based on two VRR indicators and the relation of VAT revenue to GDP was used for its measurement. In order to determine the indicator combining VRR and the relation of VAT revenue to GDP, the concept of a synthetic measure of development created by Hellwig (1968) was used. This method enables to organize linearly the analyzed objects by comparing them to the reference object characterized by the best combination of features. Linear ordering is used in order to establish a hierarchy of objects that is to put them in order from the object with the most desirable features to the object characterized by the worst set of features. From a geometric point of view, linear ordering consists in projecting points, representing objects located in a multidimensional space of variables, onto a straight line.

The first stage of determining the synthetic measure of development is standardization thanks to which it is possible make the variables describing objects comparable.

$$Z_{ij} = \frac{X_{ij} - \overline{X_j}}{s_j}$$

where:

Z_{ij}– standardized value of the variable j for the object i;

X_{ij}– value of the variable j for the object i;

i–number of the object;

j –number of the feature;

s_j– standard deviation of the variable j.

The next stage in the determination of the synthetic measure of development is the identification of the development model. The development model is characterized by the maximum values of realization of the analyzed variables, which can be illustrated as follows:

$$Z_{0j} = \max(Z_{ij})$$

Knowing the value of individual variables characterizing the model object allows designating the distance d_{i0} of individual objects Q_i from the model Q_0. In the study the author used the distance measure based on the Euclidean distance, which can be illustrated by means of the following formula:

$$d_{i0} = \sqrt[2]{\sum_{j=1}^{k} (z_{ij} - z_{oj})^2}$$

Next, on the basis of distances of individual objects from the development model, the value of the synthetic taxonomic measure of development is determined:

$$z_i = 1 - \frac{d_{i0}}{d_0}$$

where:

m –number of objects

$$d_0 = \overline{d_0} + 2s_0$$

$$\overline{d_0} = \frac{\sum_{i-1}^{m} d_{i0}}{m}$$

$$s_0 = \sqrt[2]{\frac{\sum_{i=1}^{m} (d_{i0} - \overline{d_0})^2}{m}}$$

The synthetic taxonomic measure of development z_i is a figure within the range of<0.1>. The closer to unity is the value of this measure for the given object, the more developed is the object from the point of view of features characterizing it. Thus, the value of the measure z_i enables to arrange the objects linearly according to their distance from the model object.

5. The Study

The analysis of the relation between VAT efficiency and its construction requires answering a few research questions. The first fundamental issues to be solved are the answer to the question whether the noncompliance gap is indeed correlated to the policy gap. In order to solve this problem, Pearson coefficients of linear correlation were designated for the data estimated upon the order of the European Commission concerning the size of the noncompliance gap and the policy gap for 25 EU states in 2012 commissioned on behalf of the European Commission (TAXUD/2013/DE/321). The scattering of empirical points for the above mentioned variables was presented in Figure 1.
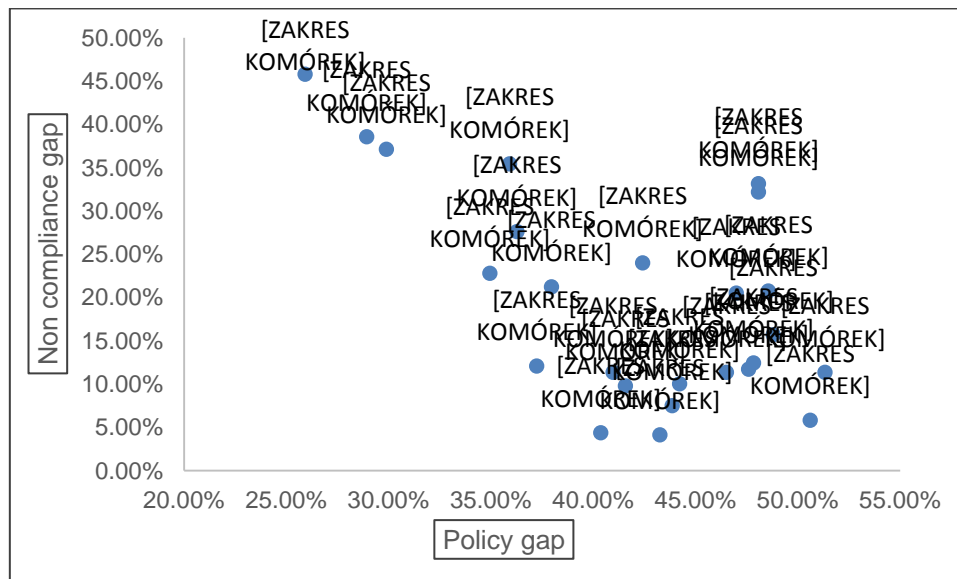
Figure 1. Relation of the policy gap to the noncompliance gap

The resultant value of the Pearson`s correlation coefficient (-0.60) confirms the existence of the negative relation statistically significant (at the significance level p=0.05) between the size of the noncompliance gap and the size of the policy gap. Similar but a bit weaker relation (Pearson`s linear correlation coefficient 0.4) was noticed for the relation between the number of groups of goods and services under preferential VAT rates and the size of the noncompliance gap (Figure 2).
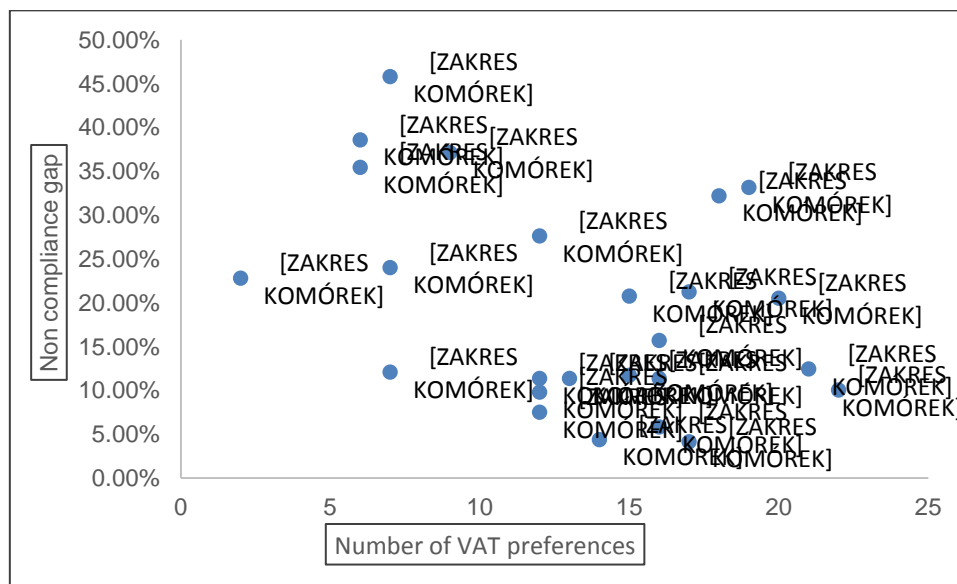

Figure 2. Number of preferences in VAT and the size of the noncompliance gap

Therefore, the results allow to verify positively the hypothesis that applying tax preferences in VAT favors the limitation of the noncompliance gap. However, it does not mean that tax preferences lead to the improvement of VAT efficiency. For it has to be borne in mind that a wider scope of such preferences entails also a bigger policy gap. Thus, there arises a question concerning the resultant effect of preferences on VAT effectiveness. Settling this issue

requires to determine the value of the tax effectiveness measure. Table 1 presents the values of the synthetic measure of VAT taxation effectiveness in 25 EU states.

Table 1. The values of synthetic measure of VAT effectiveness

1	Bulgaria	0.855927	14	Lithuania	0.428243
2	Estonia	0.799985	15	Netherlands	0.424996
3	Denmark	0.75444	16	Belgium	0.351683
4	Sweden	0.674182	17	France	0.317918
5	Finland	0.64607	18	UK	0.315354
6	Slovenia	0.628396	19	Poland	0.292279
7	Austria	0.627364	20	Latvia	0.28767
8	Hungary	0.604153	21	Ireland	0.202759
9	Malta	0.589475	22	Slovakia	0.167268
10	Romania	0.510756	23	Greece	0.13684
11	Czech Republic	0.475801	24	Italy	0.083746
12	Portugal	0.475308	25	Spain	0.06358
13	Germany	0.468317			

The presented data demonstrate that Bulgaria and northern European countries have the highest effectiveness of VAT. The least effective VAT exists in southern European countries such as Spain, Italy and Greece.

Studying the relation between the value of synthetic measure of VAT taxation effectiveness, and the number of groups of products and services benefiting from preferential rates of this tax, one can notice quite weak (Pearson`s coefficient -0.4), but statistically significant, negative relation (Figure 3).
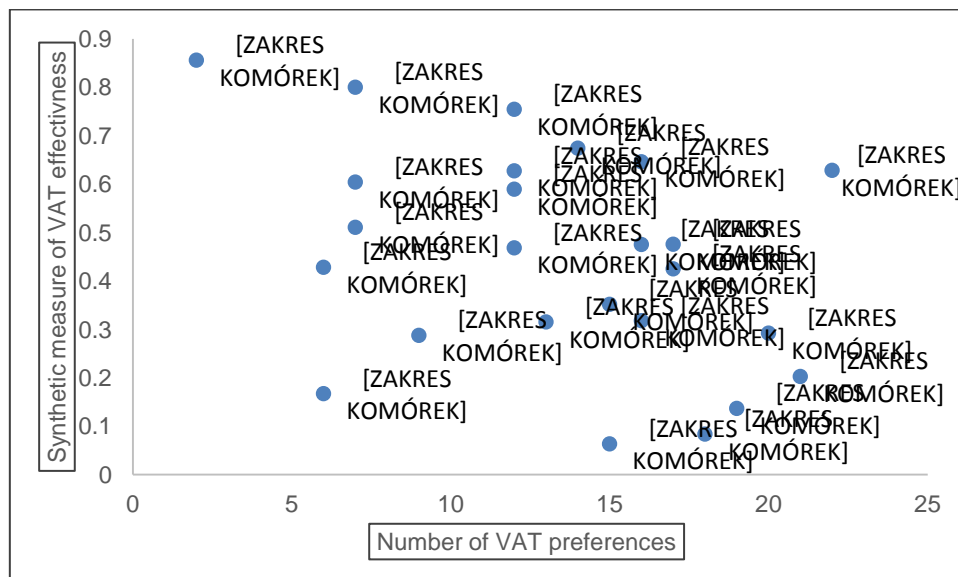

Figure 3. Number of preferences and VAT effectiveness

The results prove that the influence of tax preferences on VAT policy gap is much stronger than their impact on the limitation of the noncompliance gap. Therefore, the growth of the number of tax preferences exerts a negative impact on the effectiveness of VAT. Examining

the influence of other elements of VAT construction on its effectiveness, the author also carried out an analysis of its relation to the basic rate of this tax. The calculated value of the correlation coefficient did not confirm the existence of the expected negative relation between these variables.

6. Conclusions

The presented study enables to put forward conclusions significant from the point of view of VAT construction. As proved, there exists exchangeability between the noncompliance gap and the policy gap. In these countries in which the policy gap is smaller, the noncompliance gap is bigger. It may therefore suggest that applying tax preferences countries discourage their tax-payers from tax evasion. However, on the other hand, the revenue lost in result of the application of tax preferences cannot be fully compensated by the advantages resulting from the limitation of the noncompliance gap. In consequence, the negative relation, measured by means of the synthetic measure of effectiveness, between the number of applied tax preferences and the general effectiveness of VAT, is noticeable. Therefore, it may indicate that the countries interested in the improvement of VAT effectiveness should broaden the tax base. The last conclusion that the level of the basic tax rate has no influence on the effectiveness of taxation may be related to the fact that basic VAT rates in EU countries have been considerably harmonized – and the small differences between them do not affect the significant differences in tax-payers' behaviors.

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