

## THE RELATIONSHIP BETWEEN VAT GAP AND ECONOMIC OR INSTITUTIONAL VARIABLES

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**Abstract:** VAT evasion reduces significantly the budget revenues and is often approximated by way of VAT Gap, which refers to the difference between the total VAT that should have been collected according to the applicable VAT Law (VTTL) and VAT actually collected by public budgets. The phenomenon of VAT Gap, to a greater or lesser extent, is an acute problem in all countries of the European Union (Member States), regardless of their level of economic development. Over the past two decades, the volume of VAT evasion has had an alarmingly upward trend. Therefore, the VAT Gap should be placed in a broader context than the economic one, also taking into account economic structure, institutional variables, legal, ethical and other dimensions that affect the business environment, respectively the society. Moreover, according to the World Economic Outlook „Growth and Institutions” (2003) IMF report, the institutional factor, as a general and defining arrangement for any economic system, it is the primary "responsibility" of gap development. The objective of this study is to analyse the strength and direction of the relationship between the VAT Gap and the following economic structure and institutional variables: Fiscal Freedom (FF), Government Effectiveness (GE), Human Development Index (HDI), Corruption Perceptions Index (CPI) and People at risk of poverty or social exclusion (AROPE). Our study is consolidated on a 2009 – 2018 database, for the EU-26 Member States, including United Kingdom, divided into four groups. Within the study, we developed a Spearman Correlation between VAT Gap and each variable, aiming to point up whether these variables have a strong positive or negative influence on the VAT Gap.

**Keywords:** *VAT Gap; fiscal freedom; government effectiveness; human development; corruption; social aspects.*

**JEL Classification:** E26; G41; H11; H26.

### 1. Introduction

Taxes represent the largest share of the state budget revenues, whose main purpose is to finance public goods and services and, widely, to help strengthen

society. Therewith, the appearance of taxes, gave rise to other phenomenon, both economic and social, namely, tax evasion. Among these taxes, a significant proportion has the Value Added Tax (hereinafter only as VAT), therefore the focus of this paper will be on VAT.

Tax evasion refers both to direct and indirect taxes, but the causes are the same for both. So, the causes of tax evasion and avoidance are various, starting from general to causes specific to a certain economic period, or they can be causes of social, economic, moral, or political nature (Comandaru, 2018). Moreover, have been empirically identified other major causes of this phenomenon such as the complexity of the entire tax system and the intensity of government regulation (Shahini, 2015).

The tax system is composed of a set of taxes, but VAT is considered one of the most significant sources of government revenue globally. Moreover, the countries of the European Union stand out by above average government expenditure in terms of VAT contribution to government revenue. Therefore, VAT has become a main element of the tax system, both in developed and developing countries.

VAT evasion reduces significantly the budget revenues, and it may be approximated by way of VAT Gap, which refers to the difference between the total VAT that should have been collected according to the applicable VAT Law (further only as VTTL) and VAT actually collected by public budgets. It estimates revenue loss from fraud schemes, VAT evasion and avoidance, as well as due to bankruptcies, financial insolvencies or miscalculations. Fraud is considered the main cause of VAT Gap (European Commission, 2020).

Over the past two decades, the volume of VAT evasion has had an alarmingly upward trend. Furthermore, the most recent report provided by the European Commission (2020) indicates that at EU level, VAT Gap amounted to EUR 140 billion, which means 11.01% of the theoretical VAT liability, in 2018. The report also predicts a potential increase of VAT revenue losses in 2020 to €164 billion in 2020, due to the effects on the global economy of the coronavirus pandemic (European Commission, 2020). More than that, we can assert that VAT revenues are directly influenced by the VAT Gap. The lower the VAT Gap, the higher the rate of VAT revenue collection.

Thus, this paper will include the following: the main findings on this matter in the literature (Chapter 2 Review of the literature), the assumptions of our study and the variables used (Chapter 3 Aims of the research and defining the variables), the methods used together with our outcomes (Chapter 4 Research methods and results) and the conclusions (Chapter 4 Conclusion).

## **2. Literature review**

Studies have empirically examined the factors that affect the collection of VAT revenues. Christie and Holzner (2006) investigated for the period 2000-2003 VAT losses in 25 European countries and highlighted a positive influence of the weighted average VAT rates on VAT losses. Other studies have pointed out that the efficiency of the collection of VAT systems decreases with the increase of tax rates and due to the reduction of the tax base on which it is applied and the increase of tax evasion (Agha and Haughton, 1996; Matthews, 2003).

Reckon (2009) assessed the estimates of the VAT Gap for EU countries. His study showed that the variables Corruption perceptions index (CPI) and the position of

the legal institutions in the country have a statistically significant value in influencing the VAT Gap. Wider studies on the VAT Gap are provided by European Commission CASE studies (2020), using an econometric analysis that regressed the VAT Gaps on several explanatory variables in EU countries. The results showed that the tax collection gap is also influenced by the efficiency of governments in the management of the application of the tax in each country.

Zidkova (2014) analysed the impact of fifteen variables on the VAT Gap for the year 2002, respectively for the year 2006. The results showed that in 2006, contrary to the results for 2002, VAT Gap was not influenced by the standard VAT rate and the share of the shadow economy.

According to the World Economic Outlook „Growth and Institutions” (2003) IMF report, the institutional factor, as a general arrangement for any economic system is the primary "responsibility" of gap development. Furthermore, VAT productivity varies considerably from country to country in terms of revenue growth.

### 3. Aims of the research and defining the variables

The objective of the study is to analyse the strength and direction of the relationship between the VAT Gap and the following economic structure and institutional variables: Fiscal freedom (FF), Government effectiveness (GE), Human Development Index (HDI), Corruption Perceptions Index (CPI) and People at Risk of Poverty or Social Exclusion (AROPE). We are expecting a negative relationship between VAT Gap with FF, GE, HDI and CPI and a positive one with AROPE.

Next, we will present the target groups of countries and the variables used..

#### 3.1. Groups of countries

There are significant differences in the profile of the informal sector and economic development levels beyond the various regions of Europe (The World Bank, 2012a). Regardless of the importance of VAT revenues in countries' budgets, the VAT Gap is part of the informal sector and the goal is to minimize its value. Moreover, according to Văcărel (2007) most of the developed countries are focused more on direct taxes, while indirect taxes are more specific to the budget revenues of less developed countries or emerging countries (Butu et al., 2019).

Also, Dronca (2016) distinguished into four different development level groups, depending on fiscal behaviour in the European Economic Area.

Considering the findings of the authors as presented in the previous paragraph, for the hereby study we divided the Member States in four groups, using as criteria two coordinates regarding the approach from the fiscal perspective and their level of development represented by GDP per capita:

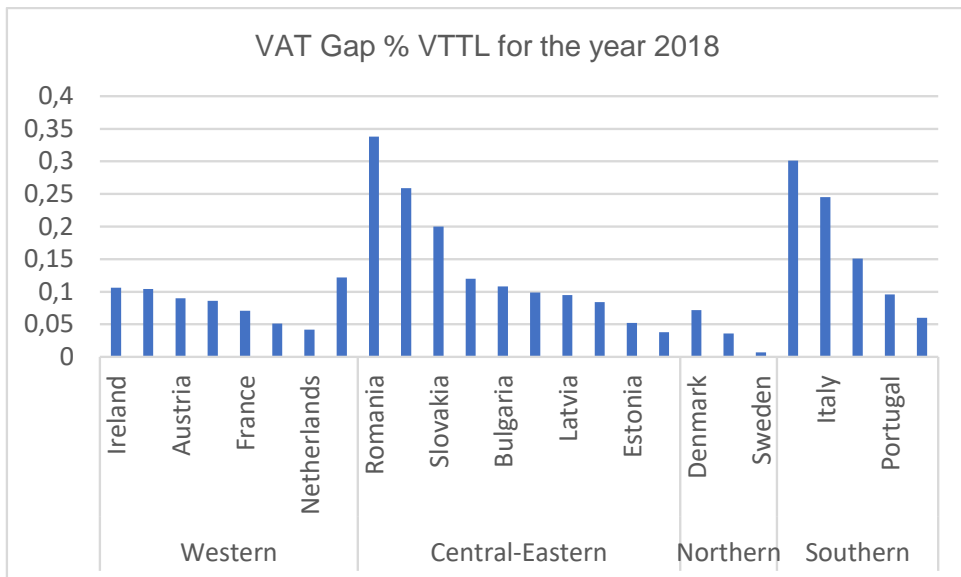
- **Southern Member States:** Cyprus, Greece, Italy, Malta, Spain, and Portugal;
- **Northern Member States:** Sweden, Denmark and Finland;
- **Central-Eastern Member States:** Bulgaria, Croatia, Hungary, Romania, Latvia, Lithuania, Estonia, Czech Republic, Slovakia, Slovenia and Poland;
- **Western Member States:** France, Germany, Great Britain, Ireland, Luxembourg, Belgium, Netherlands, Austria.

In the following, we will present the main variable, VAT Gap, and in brief the economic structures and institutional variables.

### 3.2. Variables

#### 3.2.1. VAT Gap

VAT evasion reduces significantly the budget revenues, and it may be approximated by way of VAT Gap, which refers to the difference between the total VAT that should have been collected according to the applicable VAT Law (VTTL) and VAT actually collected by public budgets. It estimates revenue loss on account of fraud schemes, VAT evasion and avoidance, as well as due to bankruptcies, financial insolvencies or miscalculation, but fraud is considered the main cause of VAT Gap (European Commission, 2020).



**Figure 1:** VAT Gap in the four groups of European countries for the year 2018. Source: own compilation based on Study and Reports on the VAT Gap in the EU-28 Member States, Final report, 2020

The first remark we can make from Figure 1 is that the Central-Eastern countries, which is composed of the "new" Member States, had higher levels of the VAT Gap compared to the "old" European Union states. Thus, we can observe an increase in the size of the VAT Gap from west to east. The values of VAT Gap are topped by Romania, a Central-Eastern country, which in 2018 recorded 33.80% VAT Gap of VTTL, followed by Greece, which is part of the Southern group. Even though 30 years have passed since the transition to democracy and the market economy, the shadow economy, which includes the VAT Gap is more widespread in the Central and Eastern European Member States, in comparison to the Western and Northern countries. Thus, it is not surprising that in the Nordic group, which includes developed countries, was registered the lowest percentage of VAT Gap in VTTL, in Sweden, 0.70%. In addition, we observe an increasing trend in the VAT Gap from North to South. From an economic point of view, the countries of southern Europe

face the problem of regional disparities. This is confirmed by the large differences between the VAT Gap values. While in Greece the VAT Gap % of VTTL exceeds 30%, in Spain the VAT Gap is only 6.00% of VTTL.

### 3.2.2. Economic structure and institutional variables

Regarding the quantification of economic and institutional background, we selected a series of indicators, taking into account both the directions presented in the previous chapter related to the literature, but also our novelty, as we chose a series of indicators that have not been studied in this embodiment and for these groups of countries, as per our research in the field. Table 1 highlights the variable and its acronym, the short description and the source of the variables, as well as the expected sign of the relationship.

**Table 1:** Definition of the variables

<b>Variables (Acronym)</b>	<b>Short description</b>	<b>Source / Expected sign</b>
Fiscal freedom (FF)	measures economic freedom using 12 quantitative and qualitative factors.	Heritage Foundation / -
Government effectiveness (GE)	reflects the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of the policy and its implementation, and the credibility of the government's commitment to such policies.	World Bank / -
Human development index (HDI)	is a summary measure of average achievement in three key dimensions of human development in a given country: health, education and income.	United Nations Development Programme / -
Corruption perceptions index (CPI)	is a composite index, based on the results of surveys of corruption, collected by several respectable institutions. It ranks countries based on how corrupt a country's public sector is perceived to be by experts and business executives. Less corruption perceived is associated with higher values.	Transparency International / -
People at risk of poverty or social exclusion (AROPE)	refers to the sum of persons who are: at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity.	Eurostat database / +

Source: adapted by authors based on public databases

#### 4. Research methods and results

In order to analyse the relationship between the VAT Gap and the economic structure and institutional variables, it was developed a Spearman Correlation that takes into account the data for 28 European Union Member States, divided into four groups. Due to lack of national data, we excluded Cyprus and Croatia, but we included United Kingdom, because in the period analysed it was still a Member State. The analysis considers 9 years, more precisely the period after the financial crisis, 2009-2018.

Correlation is a bivariate analysis that appraises the strength of the association between two variables and the direction of the relationship (Kendall and Stuart, 1973). In terms of the strength of association, a value of 0 indicates that there is no relationship, whereas a value of  $\pm 1$  indicates a perfect correlation. Regarding the direction of the relationship, a positive sign indicates a direct relationship and the variables vary together, while a negative sign indicates an inverse relationship between the variables.

Table 2 lays out the results of running the Spearman Correlation for the four groups of European countries, between VAT Gap with each variable, as well as for the 26 European Union countries.

Table 2: Spearman correlation coefficients between VAT Gap with each variable

Countries group	Relation between VAT Gap % of VTTL and economic structure and institutional variables				
	FF	GE	HDI	CPI	AROPE
EU	-0.454**	0.015	-0.701**	-0.752**	0.628**
Western	0.086	-0.180	0.076	-0.322**	0.597**
Central-Eastern	-0.117	-0.041	-0.666**	-0.461**	0.507**
Northern	0.601**	-0.813**	-0.242	0.527**	-0.188
Southern	-0.514**	-0.121	-0.122	-0.697**	0.253

Source: Author's own processing using SPSS

Note: \*\* Correlation is significant at the 0.01 level (2-tailed).

From Table 2 we can notice that at EU level, excepting Government effectiveness, all the coefficients of the variables had the expected sign and they are statistically relevant. Regarding the strength of the relationship, we can observe a relatively strong connection between VAT Gap and the variables, excepting GE.

Regarding Government effectiveness, the results show a negative relationship between VAT Gap and GE in all four groups of countries. Therefore, increasing the level of GE, by providing quality public services, transparency in public spending and investments in strategic areas determines decreases in the VAT Gap. Besides, the highest significant connection strength (-.813\*\*) is found in the Northern group. This is not surprising, considering the Nordic countries generally had high values of GE in 2018 and have a balanced economic system that determines a high effectiveness of the governance process. In other words, countries with higher quality public services and higher transparency in public spending can tackle VAT evasion, which will reduce the VAT Gap.

Unlike the four groups of countries, at EU level, there is a positive relationship between VAT Gap and Government effectiveness, but we have to consider that the value of its probability is not statistically relevant. This suggests that improving Government effectiveness increases the level of VAT Gap, which does not fold to reality. In this field, other studies suggested that in the countries with a high level of GE expressed through the perceptions of citizens on the quality of public services, the quality of the civil service, and the degree of its independence from political pressures will reduce tax evasion (Dronca, 2016; Ștefoni and Drăghia, 2020).

The variables Fiscal freedom (FF) and Human development index have had the same direction of influence on VAT Gap, excepting the Northern group. The coefficients of FF and HDI had an opposite direction at EU level and for "Central-Eastern" and "Southern" groups and, contrary to our expectations, a positive sign for the Western group.

Even though FF and HDI had opposite directions of correlation coefficients at EU Level, for "Central-Eastern" and "Southern" countries, the strength of the correlation is stronger and significant for the last group in the case of FF (-.514\*\*), respectively, in case of HDI, for "Central-Eastern" group (-.666\*\*), that generally includes developing countries. Thus, in countries which are working progressively to achieve (1) high levels of FF transposed through quantitative and qualitative factors like tax burden, fiscal health, property rights, investment or financial freedom and (2) high level of standard of living and literacy, increased life expectancy, taxpayers are more likely to pay VAT, thus leading to the reduction of the VAT Gap.

Regarding the Corruption Perceptions Index variable, the results showed that excepting the "Northern" group, CPI had opposite direction of significant correlation coefficients for all groups of countries and at EU level, as was expected. In terms of strength of association, there is a low connection in the Western group (-.322\*\*), a medium one in the Central-Eastern group (-.461\*\*) and Northern group (.527\*\*), a strong one in the Southern group (-.697\*\*) and the highest value of the coefficient was registered at EU level (-.752\*\*). This suggests the importance of CPI on VAT Gap levels. Thus, at EU level, less corruption is perceived by experts and business executives, which means a higher CPI index, would lead to a reduced VAT Gap by increasing the efficiency of VAT collection.

On the other hand, there is a positive relation in the Northern countries, which means that when less corruption is perceived, the VAT GAP will increase, which may not always fold to reality. One explanation can be that the Northern States (Sweden, Denmark and Finland) are part of the most developed countries in terms of the value of gross domestic product per capita and are focused more on direct taxes than on VAT.

The coefficients of people at risk of poverty or social exclusion (AROPE) had the positive expected direction at EU level and for all groups of countries, excepting the "Northern" group. Even if we expect a strong positive relationship, there is a low opposite connection strength (-0.188) in the "Northern" group. One explanation may be that the Northern group is made up of the most developed Member States at European level, with the lowest number of people at risk of poverty or social exclusion, and this variable will not influence the VAT Gap.

It is notable that the strength of association is also significant and above the average at EU level (.628\*\*), for the Western (.597\*\*) and "Central-Eastern" (.507\*\*) groups. This suggests that especially in these two groups, the variable

People at risk of poverty or social exclusion can be treated as a significant element in assessing the VAT Gap level. Thus, in countries with a higher number of people at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity, the tendency to avoid paying VAT is higher, so VAT Gap will register wider levels.

To sum up, although the results between different groups of Member States may be dissimilar for the reasons set out in this section and the correlation dependency is coarse in strength and direction, we believe that the trends will harmonize in the future, when almost all the Member States are going to reach the appropriate levels of economic development.

## 5. Conclusions

As per the literature, it is stated that the fiscal and budgetary policies of states, as well as the effectiveness of the institutions have a significant role in defining the aspects of the economic environment in order to have a high degree of VAT collection, thus a lower VAT Gap. The results of this paper show that at EU level, increasing the level of Fiscal Freedom, Human Development Index and Corruption Perceptions Index are correlated with decreasing the values of VAT Gap.

Furthermore, after analysing the results of the Spearman correlations, we can conclude that in the groups that include developing countries, the results are as expected. In Central-Eastern and Southern groups of countries, there is a reverse connection between VAT Gap and the following variables: Fiscal freedom (FF), Government effectiveness, Human development index (HDI), Corruption perceptions index (CPI) and a direct connection between VAT Gap and People at risk of poverty or social exclusion (ARPE). In terms of strength of the connection, while for the Central-Eastern that includes mostly developing countries, it was found a strong and significant connection between VAT Gap and HDI, for the Southern group, there is a strong and significant connection between VAT Gap and CPI.

On the other hand, contrary to the expected signs, in the Northern group, which is made up of the most developed Member States, there is a direct connection between VAT Gap and the following variables: Fiscal freedom (FF) and Corruption perceptions index (CPI).

Thus, our study shows that in the countries (1) with a high level of freedom in terms of tax, transposed through quantitative and qualitative factors like, tax burden, fiscal health, property rights, investment or financial freedom, (2) with an increased value of HDI, translated through a high level of standard of living and access to knowledge and (3) with less corruption perceived by experts and business executives, the taxpayers are more inclined to comply with the VAT requirements. Their determination to comply will be reflected in a lower VAT Gap.

Moreover, the level of GE and the number of people at risk of poverty or social exclusion increase or decrease in the same direction as the level of VAT Gap, with reservations regarding GE, because its p-value is not relevant, in our study presented hereby. In countries with a higher number of people at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity, the tendency to avoid paying VAT is higher, so the VAT Gap will register wider levels.



Although the results between different groups of Member States are contradictory and the correlation dependency is different in strength and direction, it can be said that the trends will harmonize in the future, when almost all the Member States reach the appropriate levels of competition and economic development.

In conclusion, as VAT has a relevant contribution to the financing of public goods and services, this relationship between VAT Gap and economic structure and institutional variables is relevant for economic development and institutional quality of the business environment and it can be further studied in studies elaborated for other groups of European countries and a longer period of time.

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