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Research Article

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Collection Dilemmas and Performance Measures of the Value-Added Tax in Germany and Poland

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Abstract: In the European Union Member States, value-added tax (VAT) is undergoing a continuous process of harmonization, which was initiated in the 1960s by the introduction of the First and Second Council Directives and which resulted in the implementation of the common tax assessment base. Currently, the European Union VAT system faces multiple challenges related in particular to the negative side effects of certain design features and progressing globalization. The main aim of this article is to discuss some dilemmas of the common VAT model. Particular attention is placed on the fiscal consequences of VAT preferences, as well as on the origins, components, and implications of the VAT gap. For the purpose of this analysis, 2 neighboring countries were selected, namely, Germany and Poland. On the basis of the national and Eurostat data, the author calculates the most significant VAT performance indicators and reviews the factors decreasing VAT efficiency in these countries in comparison to other European Union Member States.

Keywords: value-added tax, collection performance, tax gap, tax expenditures, tax fraud, Germany, Poland
JEL codes: H20, H21, H26

1 Introduction

Due to its revenue-raising potential, value-added tax (VAT) has become one of the most popular tax levies in the world. According to the statistics of the Organisation for Economic Co-operation and Development (OECD), the number of countries applying VAT increased from 10 in 1969 to 166 in 2016. As a result, VAT generates currently about one-fifth of global tax revenue. As is often indicated in the economic literature, VAT prevalence is a testament to its important virtues, such as efficiency, relative neutrality, simplicity, transparency, invisibility to taxpayers, and low administration and compliance costs. VAT implementation is also one of the preconditions for European Union membership. In the European Union Member States, VAT is regarded as the principal revenue source both in the budgets of particular countries as well as in the European Union budget. Its relation to the gross domestic product (GDP) in the EU-28 is nearly 7.0%, and VAT-based contributions represent approximately 12.3% of the total EU budget.

The present European VAT model is far from being ideal. Design deficiencies may threaten its functionality, distort economic agents' decisions, harm the competitive position of private businesses, and be one of the reasons for its decreased efficiency. Bettendorf and Cnossen (2014, p. 2) even indicate that in view of the VAT shortcomings, the European Union model is in danger of becoming an anachronism compared with other VATs. Widely applied diversified VAT expenditures significantly lower VAT yield.

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They increase not only the complexity of tax regulations but also the administration and compliance costs. In addition, the multitude of tax exemptions, reduced tax rates, and special schemes may create an opportunity for VAT fraud or evasion.

VAT performance and selected challenges faced by legislators in order to design a more efficient VAT system are debated in this article. Most of the papers discussing VAT analyze its performance by comparing collection efficiency indicators in all the European Union Member States, on the basis of Eurostat data only. They do not take into account national discrepancies in tax design. Although VAT base is harmonized, there are still some design features that differ more or less among countries and have considerable effect on VAT collection. Among these are inter alia certain VAT expenditures, which are addressed very rarely in international comparison – recently in the OECD publication that appeared in 2010 (Tax expenditures, 2010, pp. 1–242). Moreover, some harmonized principles, e. g., destination principle, may have a different influence on the scale of VAT fraud as a result of diversified measures applied to safeguard VAT collection. The author attempts to answer the question regarding the extent to which these features may affect collection efficiency in Germany and Poland. It verifies the opinion that the German VAT is more efficient than the Polish one as a result of both narrower application of tax expenditures and smaller VAT fraud scale.

The article is composed of 3 parts. The first part presents VAT efficiency measures such as the efficiency ratio, c-efficiency ratio, and VAT revenue ratio (VRR) to compare VAT performance in Germany and Poland. The second part discusses issues such as VAT expenditures and the VAT policy gap. The last part is devoted to VAT fraud and VAT evasion. The indicators are calculated on the basis of the data published by the Ministries of Finance of both countries. The period of analysis depends on the availability of the data and covers in particular the years 2007–2016. Selected VAT performance measures and application problems, e.g., VRR and VAT gap, are also addressed in a wider European Union context–.

2 Evaluating VAT performance in Germany, Poland, and the other European Union Member States

European Union Member States vary markedly with respect to the importance and structure of their tax revenue. In the ranking of the countries with the highest ratio of total taxes (including social security contributions) to GDP, prepared by the European Union in 2017, Germany occupies the 9th position (38.6%) and Poland – 22nd (32.5%). If social security contributions are excluded, the relative positions of these countries change: Germany ranks the 17th (23.5%) and Poland – 24th (20.0%). Germany has a tax system that is based on high social security contributions. The ratio of direct taxes to total taxation is oscillating in this country around the EU-28 average. Indirect taxes in Germany as a percentage of total taxation have been the lowest in the EU-28, and they have accounted for approximately 28.5%. In the same period, in Poland, they have represented as much as 40.1% of total taxation. It has to be noted that the European Union average in this regard is 35.1%. In Germany, the proportion of revenue collected from consumption taxes is definitely lower than in Poland and equals 27.0%. Poland is among the countries with a high share of social security contributions in total taxation (38.9%) and, at the same time, a relatively low share of direct taxes in total taxation (21.4%). However, contrary to Germany, the share of consumption taxes in Poland is higher (by 6.5 percentage points) than the EU-28 average and reaches 35.2% (Taxation Trends in the European Union, 2017, p. 193).

The taxation system in Germany is more complicated than in Poland. Germany imposes 38 different taxes (not taking into account social security contributions), while Poland imposes 17. Many German taxes are transaction based or have a local character (Steuern von A bis Z, 2016, p. 28). As a result, they have a relatively low revenue-generating potential. The VAT (*Umsatzsteuer*) makes a significant contribution to government tax revenue both in Germany and in Poland. In 2016, this tax raised approximately 217.1 billion euros in Germany and 29.8 billion euros in Poland, which represent, respectively, 30.98% and 46.93% of total tax revenue (Figures 1 and 2). Other important revenue sources in Germany include wage withholding tax (*Lohnsteuer*), assessed income tax (*veranlagte Einkommensteuer*), corporate income tax (*Körperschaftsteuer*), excise duties such as tobacco tax (*Tabaksteuer*) or energy tax (*Energiesteuer*), and

trade tax (*Gewerbesteuer*), which is one of the taxes imposed and collected by municipalities. In Poland, excise duties are notably more fiscally efficient than in Germany. Personal income tax in Poland, however, plays a less important role as a source of revenue than the German wage withholding tax and assessed income tax together. When it comes to VAT revenue (VR) in nominal terms, Germany ranks as the 1st and Poland 8th in EU-27 (Table 1). Poland collects more revenue from VAT than Belgium, Austria, and Denmark and less than Italy or Spain.

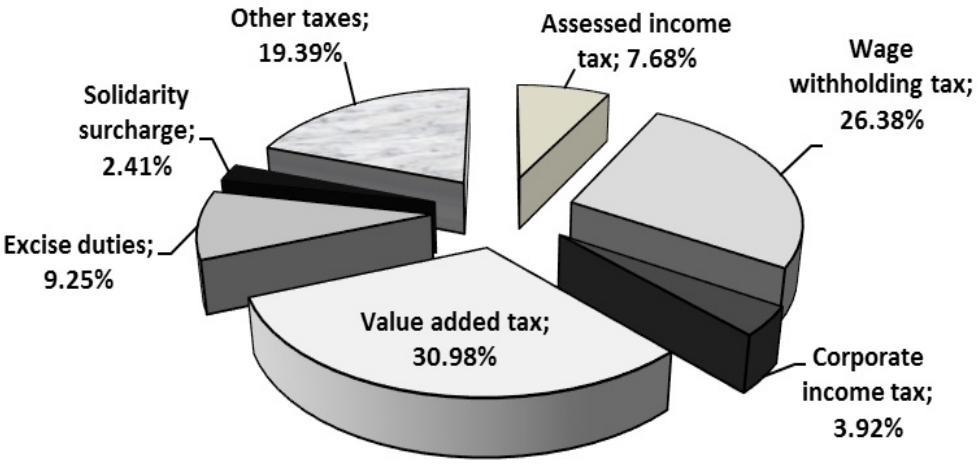

Figure 1. Structure of tax revenue in Germany in 2016. Source: Own elaboration (based on *Kassenmäßige Steuereinnahmen*, 2017).

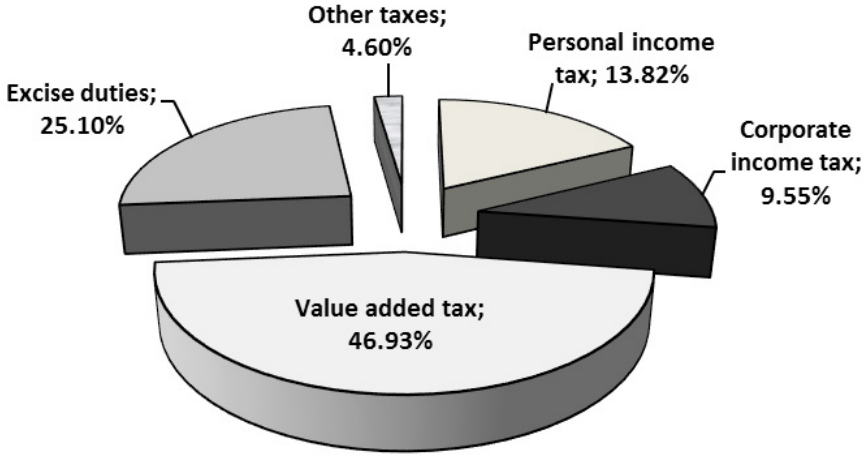

Figure 2. Structure of tax revenue in Poland in 2016. Source: Own elaboration (based on *Analiza wykonania budżetu państwa,* 2017, p. 85).

Table 1. VR, VRR, and VAT rates in the EU-27

EU Member State	VAT revenue			VRR (2014)	Tax rates (2014)		
	A (2010) (million euros)	B (2014) (million euros)	C = (B – A)/A×100 (%)		A Standard (%)	B Average weighted (%)	C =A – B percentage points
Germany	**180213**	**203081**	**12.7**	**0.55**	**19.0**	**10.5**	**8.5**
United Kingdom	113687	157428	38.5	0.44	20.0	9.2	10.8
France	135578	148129	9.3	0.48	19,6	9.8	9.8
Italy	97586	96897	-0.7	0.37	22.0	10.1	11.9
Spain	57649	63756	10.6	0.41	21.0	8.6	12.4
Netherlands	42654	42708	0.1	0.48	21.0	10.1	10.9
Sweden	33825	38846	14.8	0.57	25.0	13.0	12.0
Poland	**27466**	**29317**	**6.7**	**0.44**	**23.0**	**11.9**	**11.1**
Belgium	25262	27518	8.9	0.47	21.0	9.8	11.2
Austria	22735	25445	11.9	0.59	20.0	11.3	8.7
Denmark	23040	24985	8.4	0.59	25.0	14.7	10.3
Finland	15533	18948	22.0	0.54	24.0	12.3	11.7
Portugal	13527	14672	8.5	0.48	23.0	11.4	11.6
Greece	15958	12676	-20.6	0.37	23.0	10.6	12.4
Romania	9494	11650	22.7	–	24.0	17.6	6.4
Czech Republic	10420	11602	11.3	0.58	21.0	12.8	8.2
Ireland	10067	11498	14.2	0.49	23.0	11.2	11.8
Hungary	8442	9754	15.5	0.57	27.0	15.9	11.1
Croatia	–	5368	–	–	25.0	15.8	9.2
Slovak Republic	4182	5021	20.1	0.48	20.0	12.5	7.5
Bulgaria	3299	3799	15.2	–	20.0	14.4	5.6
Luxembourg	2600	3725	43.3	1.23	15.0	14.5	0.5
Slovenia	2926	3154	7.8	0.60	22.0	12.1	9.9
Lithuania	2180	2764	26.8	–	21.0	15.5	5.5
Latvia	1202	1787	48.7	0.51	20.0	12.6	7.4
Estonia	1257	1711	36.1	0.70	20.0	13.0	7.0
Malta	477	642	34.6	–	18.0	15.7	2.3

Source: Own elaboration (based on *Consumption Tax Trends*, 2016, p. 118; TAXUD/2015/CC/131, 2016, pp. 12 and 68).

VR depends on tax rates. In the past 15 years, VAT rates have been on the rise in the EU-28. The average standard rate for EU-28 increased from 19.6% in 2003 to 21.5% in 2017 (Taxation Trends in the European Union, 2017, pp. 24-25). This is one of the reasons for the substantial growth rate of VR, both in nominal terms as well as in relation to total taxation in some of the EU Member States. In the years 2003–2015, VAT as a percentage of total taxation grew by 2.5 percentage points in the United Kingdom and by 2.3 percentage points in Hungary and Lithuania. In Germany, with effect from 1 January 2007, the standard VAT rate changed from 16% to 19%. Since 1 January 2011, Poland applies a standard rate of 23% instead of the previously imposed 22%. Moreover, the reduced rate was also increased from 7% to 8% and a new rate of 5% was implemented. In comparison to other European Union Member States, the growth rate of VR in Poland was negligible in the period 2010–2014 (Table 1). VR increased by 48.7% in Latvia, by 43.3% in Luxembourg, by 12.7% in Germany, and only by 6.7% in Poland.

In international comparison, the standard VAT rate in Germany in 2014 was one of the lowest. A lower rate was applied only in Luxembourg and Malta. However, the average weighted VAT rate in Germany is higher than in the UK, France, Italy, Spain, Belgium, or the Netherlands. This rate, called also implicit, gives an indication of total tax incidence and is defined as a rate that, if applied to all goods and services subject to VAT, gives – ceteris paribus – the same VAT receipts. The smaller the difference between the standard rate and the average weighted rate, the less significant is the impact of reduced, super-reduced, parking, and zero rates on the tax revenue. Neither Germany nor Poland applies the super-reduced or parking rate.

Germany uses a single reduced rate of 7%, unchanged since 1 April 1983. Poland applies 2 reduced rates of 5% and 8%. The reduced rates in Germany and Poland apply to a variety of goods and services, inter alia to foodstuffs, water supplies, medical equipment, newspapers and periodicals, hotel accommodation, agriculture input, admission to cultural services, and sporting events (under statutorily defined conditions). In Germany, a reduced rate is imposed on medical and dental care; in Poland, however, standard VAT rate is used. The range of applied reduced rates in Poland is broader than in Germany. For example, in Poland, the reduced rate applies to labor-intensive services such as repair of bicycles, repair of footwear and leather goods, repair and alteration of clothing and household textile articles, and hairdressing. Moreover, Poland uses a reduced rate to tax children's car seats, supplies by undertakers and cremation services, restaurants and catering services, social housing, and admissions to amusement parks. In Germany, all the above-mentioned products and services are taxed at the standard rate (VAT Rates, 2017, pp. 3-4).

VAT and income taxes in Germany are shared, which means that the revenue collected from them is divided among the federation, the states, and the municipalities in the proportions 53.37%, 44.63%, and 2.00%, respectively, as in 2017 (*Datensammlung zur Steuerpolitik*, 2017, p. 10). The VAT share of the states and the federation tends to vary from period to period, and although the states codetermine the horizontal allocation of VAT, the final shares are totally disconnected from the revenue actually collected by particular states on their territory (Spahn 2013, p. 93). The revenue from VAT is allocated to subcentral jurisdictions on the basis of a formula that takes into account, in statutorily regulated ratios, the following factors: the number of employed obliged to pay insurance contributions, the amount of wages paid from which social insurance contributions must be made, and the revenue from the trade tax (Hybka, 2016, p. 695). In Poland, VR accrues only to the central government.

In economic literature, 3 indicators are used to evaluate VAT performance: efficiency ratio, c-efficiency ratio, and VRR. The first 2 calculated for Germany and Poland in the years 2007–2016 are shown in Table 2 and the last one – taking into account the values for 2014 (in international comparison) – is shown in Table 1. The efficiency ratio is described as the share of VR in GDP divided by the standard VAT rate, expressed as a percentage, and may be defined by the following formula:

$$E = \frac{V}{\tau_S GDP}$$

where *E* is the efficiency ratio, *V* is the VAT revenue, and *tS* is the standard VAT rate.

The c-efficiency ratio takes into account national consumption instead of GDP and is calculated as follows:

$$E^C = \frac{V}{\tau_S C}$$

where E^C is the efficiency ratio, *V* is the VAT revenue, *tS* is the standard VAT rate, and *C* is the consumption.

In Germany, both ratios are currently significantly higher than in Poland. The efficiency ratio fluctuated from 35.5% to 37.9%, and the c-efficiency ratio increased in the years 2007–2016 by almost 1 percentage point. In Poland, both ratios peaked in 2007 – the efficiency ratio at 36.9% and the c-efficiency at 47.1%, before declining during the financial crisis to 32.94% and 41.03%, respectively. After a short period of growth, they continued falling rapidly after the VAT rate increase in 2011.

Another indicator of VAT performance is the VRR. It is designed by OECD and builds on the concept of the c-efficiency ratio applied previously by the International Monetary Fund (IMF). This indicator takes into account loss of revenue due to tax exemptions, reduced rates, fraud, evasion, and tax planning (Consumption Tax Trends, 2016, p. 102). It is measured using the following formula:

$$VRR = \frac{VR}{\left(FCE - VR\right) x\, r}$$

where *VRR* is the VAT revenue ratio, *VR* is the VAT revenue, *FCE* is the final consumption expenditure, and *r* is the standard VAT rate.

Table 2. VAT performance measures in Germany and Poland in the years 2007–2016

Years	Germany			Poland		
	VR (% GDP)	Efficiency ratio (%)	C-efficiency ratio (%)	VR (% GDP)	Efficiency ratio (%)	C-efficiency ratio (%)
2007	6.75	35.52	48.93	8.11	36.88	47.08
2008	6.87	36.16	49.42	7.91	35.97	44.75
2009	7.19	37.86	49.18	7.25	32.94	41.03
2010	6.98	36.73	48.85	7.46	33.93	42.05
2011	7.03	37.00	49.98	7.71	33.53	42.17
2012	7.06	37.14	49.78	7.36	32.02	40.30
2013	6.96	36.66	49.15	6.85	29.76	37.64
2014	6.95	36.56	49.60	7.23	31.42	40.18
2015	6.92	36.43	49.78	6.84	29.75	38.92
2016	6.93	36.46	49.75	6.84	29.73	38.86

Source: Own calculation (based on the following: *Inlandsproduktberechnung*, 2017, p. 24; *Kassenmäßige Steuereinnahmen*, 2017; *Analiza wykonania budżetu państwa*, 2009, p. 50; 2011, p. 57; 2012, p. 58; 2016, p. 96; 2017, p. 85; *Roczne wskaźniki makroekonomiczne*, 2017). Both ratios, as a measure of VAT performance, were 1st applied by Ebrill et al. (2001, p. 41). According to these authors, the key difference between these ratios is that the former is normalized by reference to an income-type VAT and the latter, to a consumption type. Errors in the measurement of GDP may contaminate the 1st indicator. A more accurate measure of VAT collection efficiency is therefore the c-efficiency ratio. A c-efficiency ratio other than 100% indicates deviation from a single-rate tax on all private consumption. If it is lower, this may be a result of application of exemptions and reduced rates, tax arrears, and tax fraud; if it is higher, this may be caused by inclusion of investment in the VAT base.

The VRR illustrates the difference between the VR actually collected and the revenue that would theoretically be raised if VAT was applied at the standard rate imposed on the whole taxable base (consumption). In an ideal VAT system, where all consumption is taxed with a uniform standard rate, the VRR equals 1. A lower value of VRR may indicate the scale of derogations from the ideal VAT model and a certain degree of tax noncompliance. Among the factors affecting the value of VRR, the following are commonly considered: structural features of VAT (exemptions, reduced tax rates, registration thresholds, and special VAT schemes), evolution of consumption patterns (where the part of the potential tax base is exempt), the place of taxation provisions for international trade that diverge from the destination principle, the capacity of the tax administration to manage the tax system in an efficient way, the scale of tax evasion, fraud, and avoidance (Consumption Tax Trends, 2012, p. 113).

Table 1 shows the value of VRR in the EU-27 in 2014. Luxembourg is the only country with a VRR exceeding the theoretical maximum. It is attributed to a combination of factors, such as a relatively low standard VAT rate, the liberalization of financial services, the boom of e-commerce, the application of a special VAT regime on e-commerce, and financial services (Tax Administration, 2015, p. 205). Poland and 10 other European Union Member States have a VRR <0.5. The lowest VRR may be observed in the case of Greece and Italy. This may be ascribed to the relatively inefficient tax administration and high degree of tax noncompliance. At the opposite end, Estonia and Slovenia have the highest VRR in the European Union. Poland has a VRR 0.11 percentage points lower than Germany and comparable to that of the United Kingdom. According to OECD statistics, the VRR in Poland steadily increased in the years 1996–2007. In the years 2008 and 2009, it declined by 0.08. The next upward trend in the value of VRR was visible in the years 2010 and 2011, when it reached 0.47. In Germany, this ratio remained relatively stable and its value oscillated in the years 1996–2014 between 0.54 and 0.60.

3 Scale and structure of tax expenditures as a factor influencing VAT performance

As previously stated, one of the major factors determining tax performance is its design. In the case of VAT, a detrimental role is played by tax preferences having the form of tax exemptions, reduced tax rates, and

special tax schemes. Their effect on tax revenue has been a subject of estimations of many governments and institutions. Due to the fact that tax preferences represent departures from the ideal tax model (standard), they result in revenue loss and resemble spending; hence, tax preferences are often referred to as tax expenditures. Germany was the 1st country to measure their fiscal consequences in the 1960s (Burton and Sadiq, 2013, p. 66).

According to the estimations of the European Union, Germany is one of the EU countries with the lowest ratio of tax expenditures to tax revenue. This ratio is especially low in the case of VAT expenditures. On the contrary, Poland is among the member states with relatively high VAT expenditures (Tax expenditures in direct taxation, 2014, p. 9). Their value represented nearly 35.2% of VR and 54.8% of tax expenditures in total in 2014. The cost of tax expenditures is, however, hardly comparable among European Union Member States due to differences in their definition and the diversified methods used to calculate their value. Some countries include in the notion "VAT expenditures" all the measures derogating from the harmonized tax provisions and consider as tax expenditures all the reduced rates and exemptions. Others regard some VAT preferences as miscellaneous tax benefits.

In 2007, the Federal Ministry of Finance in Germany commissioned the Centre for European Economic Research, the consultancy Copenhagen Economics, and the FiFo Institute for Public Economics in Cologne to evaluate the 20 biggest (in terms of the revenue loss incurred) tax expenditures (Thöne, 2012, p. 5). In the report published, the authors provide a description of tax expenditures, estimations of their value, and the recommendations for their potential future maintenance, revision, or abolition. The list of the most costly tax expenditures in Germany contains 3 reduced VAT rates, namely, a rate applicable for cultural goods and books, public transport, and dental technician services. Comparing the data included in the subsidy report published every 2 years by the Federal Ministry of Finance, it has to be underlined that some of the other miscellaneous tax benefits not classified as tax expenditures also result in a relatively high tax loss (Table 3). Such measures include, inter alia, VAT exemption for medical services; reduced VAT rate on orthopedic appliances, medical equipment for the disabled, swimming pool services, and medicinal baths; or reduced VAT rate on supplies of goods and services by legal persons whose only statutory purpose are religious, social, or charitable activities specified in § 51– 68 of the Tax Ordinance Act.

Table 3. Selected VAT expenditures and *miscellaneous VAT* benefits in Germany and Poland in the years 2012–2014 (million euros)

GERMANY			
Category of VAT expenditures or miscellaneous VAT benefits	**2012**	**2013**	**2014**
VAT exemption for medical services	13410	14710	15090
VAT rate on cultural services and entertainment	3455	3415	3440
VAT rate on transport of people in urban and suburban areas	1050	1120	1160
VAT rate on accommodation services	955	1060	1090
VAT rate on orthopedic appliances, medical equipment for the disabled, swimming pool services, and medicinal baths	590	620	640
VAT rate on activities specified in § 51– 68 of the Tax Ordinance Act	325	335	335
Other VAT preferences	505	485	485
Total VAT preferences	20290	21745	22240
POLAND			
VAT rate on construction works in the residential housing sector	2641	2668	2429
VAT rate on pharmaceutical products	1147	1197	1223
VAT rate on meat and preserved meat products	675	664	691
VAT rate on restaurant services	430	430	480
VAT rate on transport of people in urban and suburban areas	406	446	457
VAT rate on dairy products	420	444	392
Other VAT preferences	4302	4378	4641
Total VAT preferences	10021	10227	10314

Source: Own elaboration (based on the following: *Preferencje podatkowe w Polsce*, 2013, p. 29; 2014, p. 30; 2015, p. 32; *Fünfundzwanzigster Subventionsbericht*, 2015, pp. 68–98).

An insight into the fiscal consequences of the application of reduced rates in Germany may be gained from certain simulation analyses. Such an analysis was conducted by Schmidt and Wiegard (2011, p. 74). According to these authors, the abolition of selected reduced VAT rates could lead to an increase in VR of nearly 26.7 billion euros. Abolishing reduced VAT rates on foodstuffs and water supplies alone may result in the growth of VR by approximately 16.6 billion euros.

Table 3 lists the most expensive VAT expenditures for the Polish budget. They include, above all, the reduced VAT rates of 5% and 8%. The first 3 expenditures on this list account for 42.1% of the total value of VAT expenditures. Reduced VAT rate on construction works in the residential housing sector is among the 3 major tax expenditures in the Polish tax system. As can be noticed on the basis of the table, contrary to Germany tax, expenditures in Poland also include reduced VAT rates on foodstuffs (e.g., reduced rate on dairy products).

The effect of VAT preferences may also be assessed on the basis of the so-called policy gap (Table 4). As the VRR measures both the scale of application of these preferences and the extent of tax noncompliance, it is usually decomposed into a policy gap and a compliance gap. The policy gap is an indicator of the additional VR that could theoretically be collected (assuming perfect tax compliance) if a country applied a uniform VAT rate on the supply of all goods and provision of all services. It is calculated by using the following formula:

$$PG = \frac{NIV - VTTL}{NIV}$$

where *NIV* is the notional ideal value (indicates an upper limit of VR, i.e., the revenue that may be obtained in the environment of perfect tax compliance if VAT was levied at a uniform rate), *VTTL* is the VAT total (theoretical) tax liability (VR that is theoretically collectable based on the VAT legislation and ancillary regulations; estimated as the sum of the liability from 6 main components: household, government, and nonprofit institutions serving household (NPISH) final consumption; intermediate consumption; gross fixed capital formation, and other largely country-specific adjustments).

Table 4. VAT policy gap in selected European Union Member States in 2014

Country	Type of tax gap		
	Policy gap	**Rate gap**	**Exemption gap**
Belgium	53.68	12.40	41.28
Denmark	41.81	0.91	40.91
France	51.81	9.97	41.84
Germany	44.79	7.15	37.64
Ireland	51.83	17.08	34.75
Malta	12.41	12.72	-0.31
Poland	49.06	15.86	33.20
Spain	59.00	14.51	44.49
United Kingdom	53.78	3.29	50.49
EU-27	43.80	5.32	38.48

Source: TAXUD/2015/CC/131, 2016, p. 53.

According to Keen (2013, p. 16), the policy gap may be divided into rate gap and exemption gap. In the European Union, there exists a considerable dispersion in the value of the policy gap across Member States. This value ranges from 12.41% in Malta to 59.00% in Spain. Both in Germany and in Poland, its value exceeds the EU-27 average. While the rate gap is in Poland more than twice as much as in Germany, the exemption gap is approximately 4.4 percentage points lower. The lowest rate gap was recorded in 2014 in Denmark and

the highest in Ireland. The exemption gap is definitely higher than the rate gap and varies from −0.31 in Malta to 50.49 in the United Kingdom.

In 2008, the European Commission decided to review the legislation on VAT reduced rates in the EU Member States taking into account arguments pro and contra for their application and initiated public consultations in this regard. In the conditions of decreasing VAT efficiency in some EU Member States, a need was perceived to broaden the tax base and to remove unjustified VAT preferences. According to the summary report published in 2017, only 14% of VAT stakeholders strongly support the current VAT rate structure in the European Union and do not see any need for reform (Summary Report, 2017, p. 6). In view of the results of the consultation, the European Commission recommended granting the member states more autonomy on setting VAT rates, subject to appropriate safeguards, to prevent distortions of competition on the Single Market and excessive complexity of tax rules.

4 VAT fraud and VAT evasion in the European Union

For nearly 2 decades, VAT fraud and VAT evasion have represented an unprecedented challenge for the tax authorities of the European Union Member States. The main sources of these phenomena were defined and their scale measured; however, countries were so far unable to devise effective methods to prevent their occurrence. One of the 1st authors to list VAT evasion practices was Tait (1988, pp. 306–313). A typology of VAT fraud and VAT evasion schemes is also presented in the publication by Keen and Smith (2007, pp. 7–10). Such schemes include, in particular, failure to register, tax collected but not remitted, underreported sales, imported goods not included in tax, omission of self-deliveries, misclassification of commodities, bogus traders (invoice mills), false claims for credit or refund, and credit claimed for VAT on purchases that are not acceptable for such credit.

The most serious, complex, and frequent schemes in the European Union are related to the so-called missing trader intracommunity fraud (MTIC). According to Bukhsh and Weigan, the following categories of this fraud exist: acquisition fraud, carousel fraud, and contra trading. Acquisition fraud is the simplest form of MTIC. It consists of intracommunity acquisition and, following this acquisition, the domestic sale of goods by the same entrepreneur without supplying a tax return or a recapitulative statement and without accounting for the VAT due in the country of destination.

Carousel fraud occurs when goods are acquired zero-rated and sold in the country of destination by an entrepreneur conducting its taxable activity in one of the European Union Member States. When this type of fraud is committed, the acquirer goes missing without remitting the VAT due on both the intracommunity acquisition and supply of goods to another domestic entrepreneur. However, the goods are not consumed in the country of acquisition but are sold through a series of traders and then exported outside the European Union or supplied to a trader from another EU Member State. This procedure can be repeated over and over again and, as a result, goods may be circulating in a carousel.

Contra trading involves 2 overlapping carousels (fictitious and legitimate) that are used to evade detection by tax authorities, as a result of the concealment of the fraud and applying an accounting scheme aimed at the neutralization of input and output VATs. The so-called “contra trader” takes part in 2 different types of the transaction chain at the same time. Within the 1st type, the trader deducts input VAT on purchases from domestic traders and makes zero-rated supplies to customers in other EU Member States (tax loss chain), and within the 2nd, the same trader acquires goods from another EU Member State and sells them domestically, generating an output tax liability (contra chain). The 1st chain will trace back to a missing trader or another contra trader.

VAT fraud and VAT evasion are the principal factors generating a VAT gap that reached nearly 159.5 billion euros in the EU-27 in 2014. Table 5 illustrates its value for Germany and Poland in the years 2010–2014. The VAT gap (compliance gap) and the policy gap, analyzed in the section on “Evaluating VAT performance in Germany, Poland, and the other European Union Member States”, are closely interrelated. Multiple and diversified tax rates and exemptions may increase the complexity of the tax system and, at the same time, the scale of tax noncompliance. Reducing the policy gap could be considered as a method to minimize the

compliance gap. On the other hand, attempts to curtail the scale of tax noncompliance may encourage taxpayers to exploit opportunities offered by preferential tax measures.

Table 5. VTTL, VR, and VAT gap in Germany and Poland in the years 2010–2014

Country	Specification		Year				
			2010	2011	2012	2013	2014
Germany	VTTL	million euros	199390	213145	218749	221107	226570
		V (VTTL)%	–	6.90	2.63	1.08	2.47
	VAT revenue	million euros	180213	189910	194034	197005	203081
		V (VAT revenue) %	–	5.38	2.17	1.53	3.08
	VAT gap	million euros	19177	23235	24715	24102	23489
		V (VAT gap) %	–	21.16	6.37	−2.48	−2.54
	VAT gap, as % of VTTL		10%	11%	11%	11%	10%
Poland	VTTL	million euros	32582	36526	37063	36834	38090
		V (VTTL) %	–	12.11	1.47	-0.62	3.41
	VAT revenue	million euros	25863	28910	27406	27487	28916
		V (VAT revenue) %	–	11.78	-5.20	0.29	5.20
	VAT gap	million euros	6719	7615	9657	9348	9174
		V (VAT gap) %	–	13.34	26.81	-3.20	-1.86
	VAT gap, as % of VTTL		21%	21%	26%	25%	24%

1 euro = 4.2423 PLN, as on 04 August 2017.

VTTL – VAT total (theoretical) tax liability.

V (value) = ($Vt_2 - Vt_{1)}/Vt_1 \times 100$, where Vt_2 represents the VTTL, VAT revenue, and VAT gap in year t_2, and Vt_1 represents the VTTL, VAT revenue and VAT gap in year t_1.

Source: TAXUD/2015/CC/131, 2016, pp. 25 and 43.

In Germany, the VAT gap as a percentage of the theoretical revenue has been relatively stable. In Poland, however, it has increased considerably in the past 10 years. It accounted for as much as 26% of VTTL in 2012. This value places Poland among the member states with the highest VAT gap in the European Union. In 2014, the VAT gap was higher only in 6 countries: Romania, Lithuania, Malta, Slovak Republic, Greece, and Italy. In Germany, the VAT gap was lower than the EU-27 average in 2014 (Figure 3).

5 Conclusion

From the revenue collection point of view, VAT is an indispensable element of the tax systems in all the European Union Member States. To reiterate Keen and Lockwood, it may be confirmed that in both Germany and Poland, VAT "is a money machine" (2006, p. 905). Germany raises its VR in a relatively efficient way, while, in Poland, the VAT system is still far from being perfect. All the VAT efficiency indicators in Germany are markedly higher than in Poland. Moreover, Poland is one of the countries in the EU with the lowest VAT efficiency ratios. Such a situation is a consequence of diverse factors, in particular, a comparatively wide range of VAT preferences and the growing scale of VAT fraud and evasion.

In the EU-27, the policy gap is more than twice as high as the VAT gap. It indicates that the most considerable loss of revenue in the member states is due to the application of reduced VAT rates and exemptions and not due to VAT noncompliance. Germany and Poland are in a group of countries with a policy gap exceeding the EU-27 average. Differences may be noticed in respect to the structure of the policy gap. Its main component in Germany is the exemption gap, which is approximately 5 times as high as the rate gap. In Poland, the relation between these 2 gaps is not as substantial. The exemption gap is definitely higher than the rate gap.

Extensive revenue loss in Poland is caused by VAT fraud and evasion. The VAT gap in Poland in the past 5 years due to these phenomena was twice as much as the EU-27 average and nearly 13.7 percentage points higher than in Germany in 2014. This gap grew from only 9% of theoretical tax liability in 2005 to 26% in

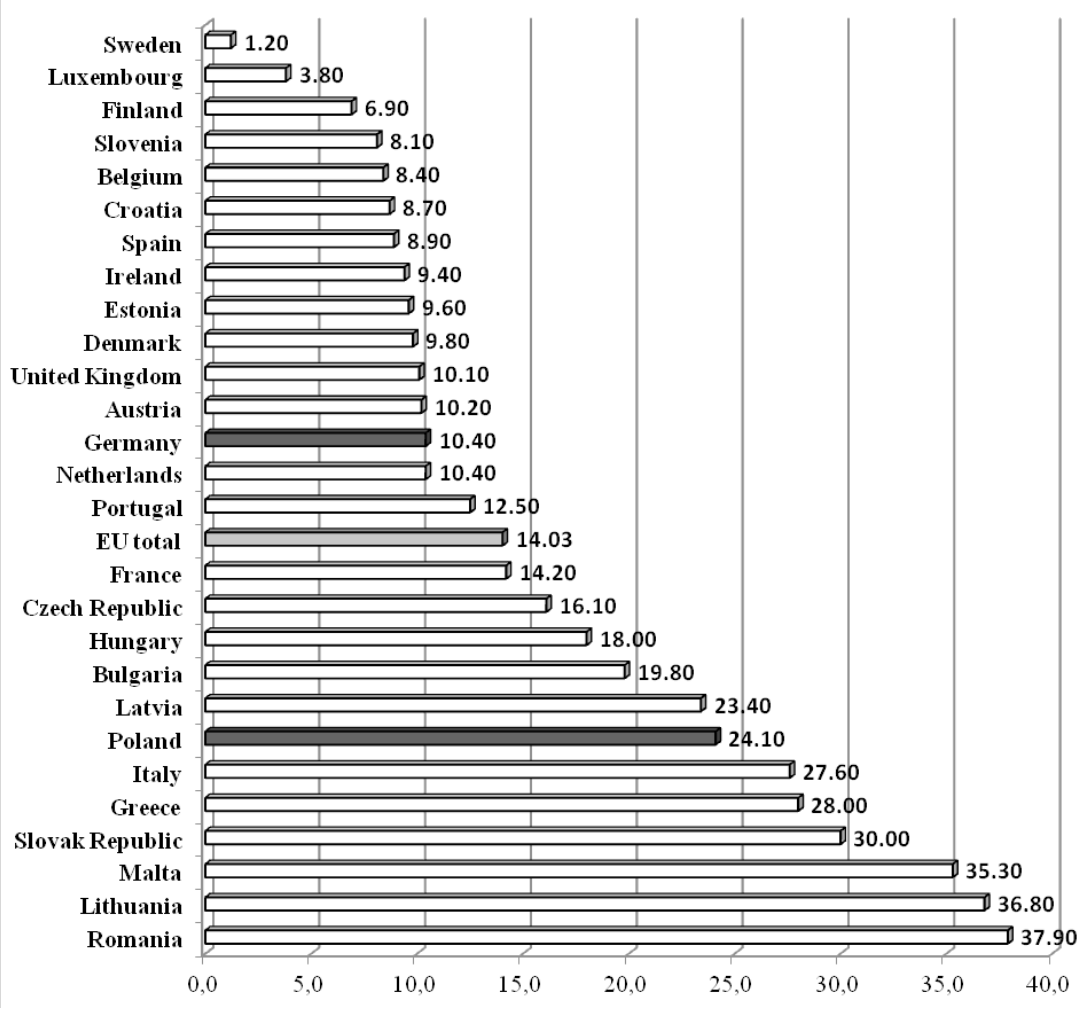

Figure 3. VAT gap in the EU-27 in 2014 (% VTTL). Source: TAXUD/2015/CC/131, 2016, p. 16.

2012. Being faced with such an astronomical rise in the scale of tax noncompliance, the Polish government is undertaking multiple measures to narrow the VAT gap by 2020. These measures include, inter alia, the following:

- tax audit organizational reform that is aimed at unifying the competencies previously assigned to 3 types of institutions, namely, tax administration (tax offices and tax chambers), fiscal audit offices, and customs administration (customs offices and customs chambers), in the hands of a new authority – National Treasury Administration;
- introduction of a standard audit file that results in an obligation being imposed on taxpayers conducting businesses to keep their books and provide predefined accounting data to the tax authorities in the electronic form;
- the so-called fuel package, which means the introduction of a set of regulations for entrepreneurs operating in the fuel sector;
- the application of a split payment mechanism that consists in dividing the payments for goods and services into 2 parts; the one corresponding to the net value of sale would be paid to the supplier's bank account and the remaining part corresponding to VAT would be transferred to the separate special account, the so-called VAT account.

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