CASE Reports

Study and Reports on the VAT Gap in the EU-28 Member States: 2017 Final Report

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List of Acronyms and Abbreviations

CASE	Center for Social and Economic Research (Warsaw)
CEE	Central and Eastern Europe
COICOP	Classification of Individual Consumption according to Purpose
CPA	Statistical Classification of Products by Activity in accordance with Regulation (EC) No 451/2008 of the European Parliament and of the Council of 23 April 2008 establishing a new statistical classification of products by activity)
EC	European Commission
ESA95	European System of Accounts 1995 in accordance with Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community
ESA10	European System of Accounts 2010 in accordance with Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union
EU	European Union
EU-27	Current Member States of the European Union except Cyprus
EU-28	Current Member States of the European Union
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
IC	Intermediate Consumption
MOSS	Mini One Stop Shop
MTIC	Missing Trader Intra Community
NAC	National Currency
NPISH	Non-Profit Institutions Serving Households
OECD	Organisation for Economic Cooperation and Development
ORS	Own Resource Submissions
o/w	of which
QRM	Quick Reaction Mechanism
SUT	Supply and Use Tables
TAXUD	Taxation and Customs Union Directorate-General of the European Commission
UK	United Kingdom
VAT	Value Added Tax
VTTL VAT	Total Tax Liability
VR VAT	Revenue

Executive Summary

This analysis serves as the Final Report for the DG TAXUD Project 2015/CC/131, "Study and Reports on the VAT Gap in the EU-28 Member States", which is a follow up to the reports published in 2013, 2014, 2015, and 2016.

We present new estimates of the VAT Gap and the Policy Gap for the year 2015, as well as updated estimates for the years 2011–2014. This report provides first estimates of the VAT Gap for Cyprus, using the newly revised national accounts data from the Cyprus Statistical Agency.

The VAT Gap is the difference between the amount of VAT revenue actually collected and the theoretical amount that is expected to be collected, given the observed information on the country's economy and the actual VAT legislation. The amount of VAT total theoretical liability, known as VTTL, is calculated using the so-called "top-down" approach: the national VAT rate structure is imposed on the national accounts expenditure and investment data at the most detailed level possible to derive expected liability.

VAT Gap cannot be treated as a straightforward equivalent of VAT fraud. Apart from VAT fraud and tax evasion and avoidance, the VAT Gap can be influenced by bankruptcies and tax arrears, as well as reporting problems in national accounts.

An important change in the VAT rules in 2015 came with the introduction of the MOSS regime, which changed the way VAT was invoiced for exported electronic services. VAT structure remained unchanged in most countries, with only three Member States changing the level and scope of VAT rates.

Nominal VAT revenues increased on average by 4.5 percent in the EU-27—a combination of revived economic growth (2.9 percent) and an increase in VAT compliance (2.4 percent).[1]

In nominal terms, in 2015, the VAT Gap in the EU-28 Member States amounted to EUR 151.5 billion. The VTTL accounted for EUR 1,187.8 billion, whereas VAT revenue was EUR 1,035.3 billion. Expressed as a percent of VTTL, the VAT Gap share dropped to 12.8 percent, down from 14.1 percent in 2014. In absolute values, the VAT Gap dropped by EUR 8.7 billion and is at its lowest level since 2011. The share of the VAT Gap in the VTTL decreased in 20 Member

1 Figures are not additive.

States, and increased only in 7 out of the total 27 Member States (EU-28 excluding Cyprus).

The smallest Gaps were observed in Sweden (-1.42 percent)[2], Spain (3.52 percent), and Croatia (3.92 percent). The largest Gaps were registered in Romania (37.18 percent), Slovakia (29.39 percent), and Greece (28.27 percent). Overall, half of the EU-27 Member States recorded a Gap below 10.8 percent.

2 Possible reasons for negative VAT Gap are use of cash vs accrual revenues, underestimation of GFCF liabilities, or incompleteness of national accounts.

Introduction

This Report presents the fifth follow-up of the "Study to quantify the VAT Gap in the EU Member States", which was conducted by Barbone et al. in 2013, 2014, 2015, and 2016.[3] This update contains new VAT Gap estimates for 2015, as well as updated estimates for 2011–2014. It also includes the first ever VAT Gap estimates for Cyprus.[4]

The VAT Gap is essentially the difference between expected and actual VAT revenues. One of the primary interests in the VAT Gap lies in its connection to VAT fraud, an important political and economic issue across Member States and for the EC. Numerous measures to tackle different forms of VAT tax evasion are discussed, debated, and implemented by EU Member States and the EC, such as the extension of the reverse charge mechanism, the recapitulative statement of intra-EU supplies, and the quick VAT fraud reaction mechanism (QRM), among others.

However, the VAT Gap estimates presented in this report should not be directly interpreted as VAT fraud estimates.[5] Other factors such as bankruptcies, tax arrears, and reporting problems in national accounts can contribute positively to the VAT Gap. Therefore, the VAT Gap should be more cautiously treated as an upper bound estimate of VAT non-compliance, as well as a general index of the VAT system efficiency and tax administrations capacity to collect VAT.

The structure of this report resembles that of the previous publications. Chapter I of the report presents the main economic and policy factors that affected Member States during the course of 2015. It also includes a decomposition of the change in VAT revenues into base, effective rate, and tax compliance components. The overall results are presented and

3 The first study of the VAT Gap in the EU was conducted by Reckon (2009); however, due to differences in methodology, it cannot be directly compared to these latter studies.

4 Cyprus VAT Gap estimates were omitted in the previous publications due to the absence of national accounts data.

5 VAT evasion – generally comprises illegal arrangements where tax liability is hidden or ignored, i.e. the taxpayer pays less tax than he/she is supposed to pay under the law by hiding income or information from the tax authorities; VAT fraud - is a form of deliberate evasion of tax which is generally punishable under criminal law. The term includes situations in which deliberately false statements are submitted or fake documents are produced; VAT avoidance – acting within the law, sometimes at the edge of legality, to minimise or eliminate tax that would otherwise be legally owed. It often involves exploiting the strict letter of the law, loopholes and mismatches to obtain a tax advantage that was not originally intended by the VAT legislation.

briefly described in Chapter II. Chapter III provides detailed results and outlines trends for individual countries coupled with analytical insights. In Chapter IV, we examine the Policy Gap and the contribution that VAT reduced rates and exemptions have made to this Gap. Annex A contains methodological considerations on the VAT Gap and the Policy Gap. Annex B provides statistical data and a set of comparative tables.

1. Background: Economic and Policy Context in 2015

a. Economic Conditions in the EU during 2015

2015 marked the third year of recovery since the economic crisis of 2011. Combined real GDP growth in the EU was 2.2 percent in 2015, up from 1.7 percent in 2014 and 0.2 percent in 2013. At the same time, nominal final consumption increased by approximately 4 percent and nominal GFCF by roughly 6 percent (see Table 1.1).

The highest growth rate of 26 percent in Ireland stands out as an accounting artefact, which occurred when several multinational companies moved their headquarters to Ireland and appeared on the investment balance sheet. The nominal final consumption expenditure in Ireland increased at a much moderate rate of 4 percent. For the remaining Member States, excluding Greece, real GDP growth rates were positive and ranged from 0 percent (Finland) to 7.3 percent (Malta).

The only country to experience a downturn in 2015 was Greece, with negative growth in final consumption as well as investment and intermediate consumption.

Table 1.1 also illustrates a well-known general fact about the nature of investment: changes in investment are much more variable than changes in consumption, both across countries and across time. In this example, it would hold true even if we compare variations without taking extreme GFCF growth rates into account (i.e. as in Ireland and Malta). If we were to examine the variation of GFCF over time for a particular sector: investment by government, households, or financial enterprises, among others, the picture would look even more complicated. It is mainly because of this feature that it is necessary to revise VAT Gap estimates whenever new information on actual investment figures becomes available.

Table 1.1. Real and Nominal Growth in the EU-28 in 2015

Member State	Real GDP Growth (%)	Nominal Growth (%)			
		GDP	Final Consumption	GFCF	Intermediate Consumption Consumption
Belgium	1.5	2.4	1.2	2.9	0.9
Bulgaria	3.6	5.9	4.8	5.4	3.2
Czech Republic	5.3	6.5	3.8	12.2	3.5
Denmark	1.6	2.5	2.2	2.9	0.8
Germany	1.7	3.7	3.0	3.2	0.3
Estonia	1.4	2.5	5.5	-0.5	-1.4
Ireland	26.3	32.4	4.5	37.0	58.4
Greece	-0.2	-1.3	-1.9	-1.6	-5.4
Spain	3.2	3.7	2.8	6.9	4.9
France	1.1	2.2	1.5	0.9	0.6
Croatia	2.2	2.3	0.1	4.1	1.7
Italy	0.8	1.5	1.0	1.8	-0.1
Cyprus	1.7	0.4	-0.1	14.1	0.7
Latvia	2.7	3.1	3.5	-1.8	1.8
Lithuania	1.8	2.0	3.8	6.3	-6.1
Luxembourg	4.0	4.7	3.0	0.6	15.0
Hungary	3.1	4.9	3.7	4.3	4.9
Malta	7.3	9.8	6.3	58.2	7.4
Netherlands	2.3	3.1	1.4	10.8	0.2
Austria	1.0	2.9	2.0	2.3	-0.1
Poland	3.8	4.6	2.3	6.5	3.2
Portugal	1.6	3.7	2.8	5.5	0.7
Romania	3.9	6.4	6.3	8.4	2.3
Slovenia	2.3	3.3	0.6	2.9	2.0
Slovakia	3.8	3.6	3.1	16.9	5.4
Finland	0.0	2.0	1.6	1.1	-2.3
Sweden	4.1	6.2	4.3	9.0	n/a
United Kingdom	2.2	2.8	2.3	4.8	n/a
EU-28	2.2	5.1	4.1	6.0	n/a

Source: Eurostat.

b. VAT Regime Changes

One of the most important changes in 2015 was the EU-wide change in regulation regarding "place of supply" of electronic services.[6] Before 2015, VAT charged on electronic services was invoiced to the country where the provider of services is registered, like for any other good. Since 2015, however, the VAT is to be paid to the country of customer residence. A voluntary MOSS system was set up in each EU country to facilitate VAT accounting. During the transitional period, the countries could retain 30 percent of the VAT revenues generated under the old regime. This change had a profound effect on the countries with a large export of electronic services, such as Luxembourg and Malta. The methodological issues regarding the introduction of the MOSS system concerning VAT Gap estimations are discussed in Section a of Annex A.

Luxembourg was one of the three Member States that implemented changes to the VAT rates structure, partly to counteract the loss of revenue due to MOSS. Except for the super reduced rate, all other rates in Luxembourg were raised by two percentage points.

In Greece, the government raised the rates in July 2015 as part of the bailout agreement with the EU. In particular, rates were raised for several of the food products and for hotels and accommodation services. Additionally, Greece's mainland rate was established on several of the islands, where a 30 percent lower rate had been in use before.

The Czech Republic has introduced a lower 10 percent reduced rate for special items, such as pharmaceuticals, vaccines, and baby food (see Table 1.2).

Another noticeable change in VAT rules in 2015 was the expansion of the reverse charge mechanism across several countries (the process began in 2013-2014). In particular, the application of the reverse charge was extended in the Czech Republic, Italy, Hungary, Poland, and Slovenia. Importantly, the introduction of the reverse charge can have a negative temporary effect on VAT revenues due to delays in tax collection.

Across the EU, the standard VAT rate varied from 17 percent in Luxembourg to 27 percent in Hungary. The median standard rate remained at 21 percent. However, the median effective VAT rate was equal to 12.5 percent.

6 Council Directive 2008/8/EC – place of supply of services and subsequent regulations (Council Implementing Regulation (EU) No 1042/2013 – place of supply of services; Council Implementing Regulation (EU) No 967/2012 – obligations under the one-time registration scheme (MOSS); Commission Implementing Regulation (EU) No 815/2012 - standardised information for registrations and returns).

Table 1.2. VAT Rate Structure as of 31 December 2014, and Changes during 2015

Member State	Standard Rate (SR)	Reduced Rate(s) (RR)	Super Reduced Rate	Parking Rate	Changes during 2015	Weighted Average Rate[1]
Belgium	21	6 / 12	-	12	-	10.0
Bulgaria	20	9	-	-	-	14.5
Czech Republic	21	10/15		-	new RR 10	12.7
Denmark	25	-	-	-	-	14.7
Germany	19	7	-	-	-	10.6
Estonia	20	9	-	-	-	12.8
Ireland	23	9 / 13.5	4.8	13.5	-	11.2
Greece	23	6 / 13	-	-	RR 6.5 to 6	10.8
Spain	21	10	4	-	-	8.5
France	19.6	5.5 / 10	2.1	-		9.6
Croatia	25	5/13	-	-		16.0
Italy	22	10	4	-	-	10.2
Cyprus	19	5 / 9	-	-		10.4
Latvia	21	12	-	-	-	12.2
Lithuania	21	5 / 9	-	-	-	14.2
Luxembourg	17	8	3	14	SR 15 to 17, RR 6 to 8, PR 12 to 14	12.9
Hungary	27	5 / 18	-	-	-	15.8
Malta	18	5 / 7	-	-	-	12.3
Netherlands	21	6	-	-	-	10.1
Austria	20	10	-	12	-	11.2
Poland	23	5 / 8	-	-	-	11.9
Portugal	23	6 / 13	-	13	-	11.5
Romania	24	5 / 9	-	-	-	18.0
Slovenia	22	9.5	-	-	-	11.9
Slovakia	20	10	-	-	-	12.6
Finland	24	10 / 14	-	-	-	12.2
Sweden	25	6 / 12	-	-	-	13.0
United Kingdom	20	5	-	-	-	9.4

Source: TAXUD, VAT Rates Applied in the Member States of the European Union: Situation of 1st January 2016.

7 Ratio of VTTL and tax base. See methodological considerations in Section d in Annex A.

c. Sources of Change in VAT Revenue Components

The value of actual VAT revenue can be expressed as the product of three components:

Actual Revenue = Net Base * Effective Rate * Compliance Gap, where Effective Rate is the ratio of theoretical VTTL to the Net Base. The Net Base (which is the sum of final consumption and investment by households, NPISH, and government), in turn, is calculated as the difference between Gross Base, which includes VAT, and VAT revenues actually collected.

Table 1.3 presents the decomposition of the total changes in nominal VAT revenues into these three components: change in net taxable base, change in the effective rate applied to the base, and change in the compliance gap (Table 1.3 does not include Cyprus, for which the figures for 2014 are not available).

The highest contributing factor to the increase in revenues was growth in nominal net base: across the EU, this was about 2.9 percent. In two Member States, Greece and Croatia, the base shrank by 2.4 and 1.2 percent, respectively.

Malta and Luxembourg experienced the biggest negative change in effective rate, an effect generated by the loss of VTTL due to the MOSS regime introduction. The biggest positive increase in the effective rate — by 8.5 percent — was in Greece, which had made changes in its VAT rate structure. The 6.5 percent increase in the effective rate in Croatia, despite any changes to the VAT legislation, is explained in greater detail in the footnote.[8]

Excluding Malta and Luxembourg, the EU average increase in the effective rate was just 0.6 percent.

Finally, increase in VAT compliance was the second major contributor to the growth in revenues, in total 1.5 percent in the EU-28.

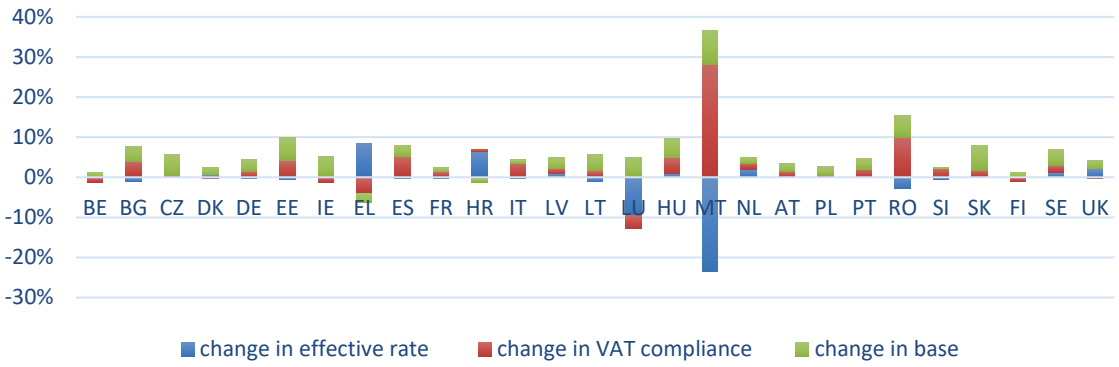
8 The increase in the effective rate in Croatia occurred as a result of the combination of a stagnant gross base, a stagnant VTTL, and a simultaneous increase in nominal revenues. Subsequently, the net base, calculated as the difference between the gross base and the VAT revenues, has contracted, and the effective rate has increased.

Table 1.3. Change in VAT Revenue Components (2015 over 2014)

Member State	Change in Effective Rate (%)	Change in VAT Compliance (%)	Change in Base (%)	Change in Revenue (%)
Belgium	-0.1	-1.1	1.3	0.1
Bulgaria	-1.1	3.9	3.7	6.6
Czech Republic	0.2	0.2	5.3	5.7
Denmark	0.6	-0.4	1.9	2.1
Germany	-0.3	1.5	2.9	4.2
Estonia	-0.6	4.2	5.6	9.4
Ireland	0.2	-1.3	5.0	3.8
Greece	8.5	-4.0	-2.4	1.6
Spain	-0.3	5.2	2.7	7.8
France	-0.3	1.4	1.0	2.1
Croatia	6.5	0.4	-1.2	5.7
Italy	-0.3	3.5	0.8	4.1
Latvia	0.9	1.3	2.7	5.0
Lithuania	-1.2	1.6	4.0	4.5
Luxembourg	-9.5	-3.3	5.0	-8.0
Hungary	0.8	4.0	4.8	9.8
Malta	-23.4	28.2	8.5	6.5
Netherlands	2.1	1.4	1.5	5.1
Austria	0.0	1.5	1.8	3.3
Poland	0.0	0.5	2.1	2.6
Portugal	-0.1	2.0	2.8	4.7
Romania	-2.8	9.9	5.4	12.6
Slovenia	-0.4	2.1	0.3	2.0
Slovakia	0.1	1.6	6.1	7.9
Finland	0.0	-1.0	1.1	0.1
Sweden	1.2	1.7	4.1	7.2
United Kingdom	2.1	-0.3	2.2	4.0
EU-27 (total)	**2.1**	**1.5**	**4.0**	**7.9**

Source: own calculations.

Figure 1.1. Change in VAT Revenue Components (2015 over 2014)



Source: own calculations.

2. The VAT Gap in 2015

The VAT Gap measured in this study was estimated using essentially the same methodology as in the previously cited VAT Gap studies. The VAT Gap is defined as the difference between the VAT total tax liability (VTTL, sometimes also known as VAT total theoretical liability) and the amount of VAT actually collected. We compute VTTL in a "top-down" approach by deriving the expected VAT liability from the observed national accounts data, such as supply and use tables (SUT). In particular, VAT liability is estimated for final household, government, and NPISH expenditures; non-deductible VAT from intermediate consumption of exempt industries; and VAT from GFCF of exempt sectors. We also account for country-specific tax regulations, such as exemptions for small business under the VAT thresholds (if applicable); non-deductible business expenditures on food, drinks, and accommodation; and restrictions to deduct VAT on leased cars, among others. The precise formula is given in Section d in Annex A.

The availability and quality of SUT data varies greatly country by country and year by year. In the course of our computations, some expenditure and investment figures, which are not available for the latest years, are estimated using industry- and sector-specific growth rates and taxable shares.[9] This requires the frequent revision of previous estimates whenever actual national accounts data is published or new information on the taxable investment becomes available.

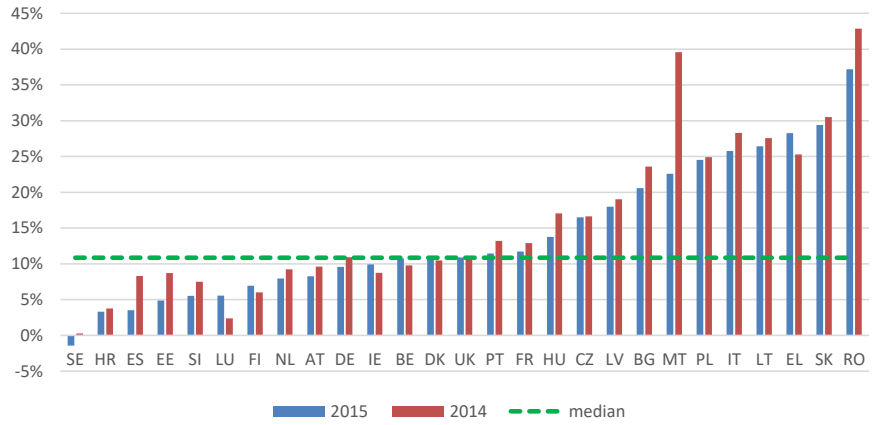
In nominal terms, in 2015, the VAT Gap in the EU-28 Member States amounted to EUR 151.5 billion. The VTTL accounted for EUR 1,187.8 billion, whereas VAT revenue was EUR 1,035.3 billion. In relative terms, the VAT Gap share dropped to 12.8 percent down from 14.1 percent in 2014, and is at its lowest value since 2011. In absolute values, the nominal VAT Gap has dropped by EUR 8.7 billion and is at its lowest value since then. Of the EU-27 (excluding Cyprus), the VAT Gap share decreased in 20 countries and increased in only 7—namely, Belgium, Denmark, Ireland, Greece, Luxembourg, Finland, and the UK (see Figure 2.2).

9 The SUT are estimated using the RAS method, an iterative scaling procedure whereby a matrix is adjusted until its column sums and row sums equal to pre-specified totals. The GFCF VAT liability is estimated based on national accounts investment data in the specific sector combined with the shares of investment taxed at different rates, which, in turn, are derived from ORS.

The smallest Gaps were observed in Sweden (-1.42 percent), Spain (3.52 percent), and Croatia (3.92 percent). The largest Gaps were registered in Romania (37.18 percent), Slovakia (29.39 percent), and Greece (28.27 percent). Overall, half of the EU-27 Member States recorded a Gap below 10.8 percent (see Figure 2.1).

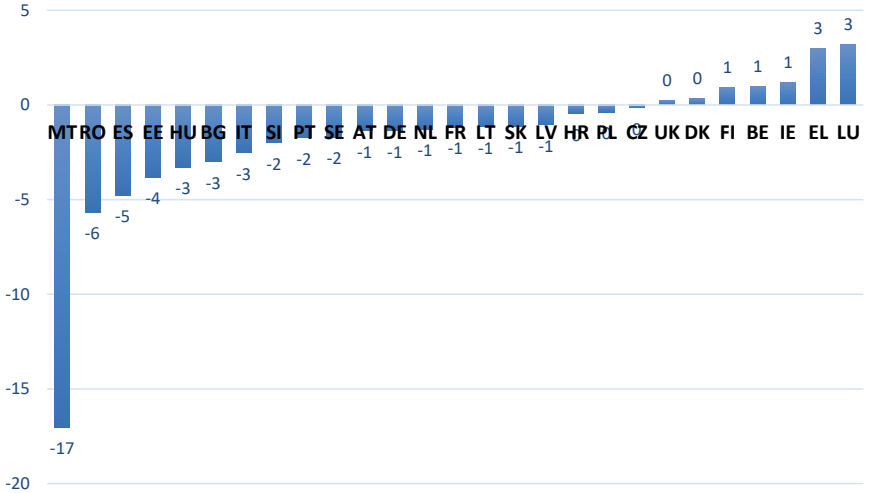
The biggest decline in the VAT Gap share occurred in Malta, as the result of a 17 percent decline in VTTL due to the effect that the introduction of the MOSS regime had on the e-gambling industry. The second biggest decline in VAT Gap (5.7 percentage points) occurred in Romania.

Figure 2.1. VAT Gap as a percent of the VTTL in EU-27 Member States, 2015 and 2014



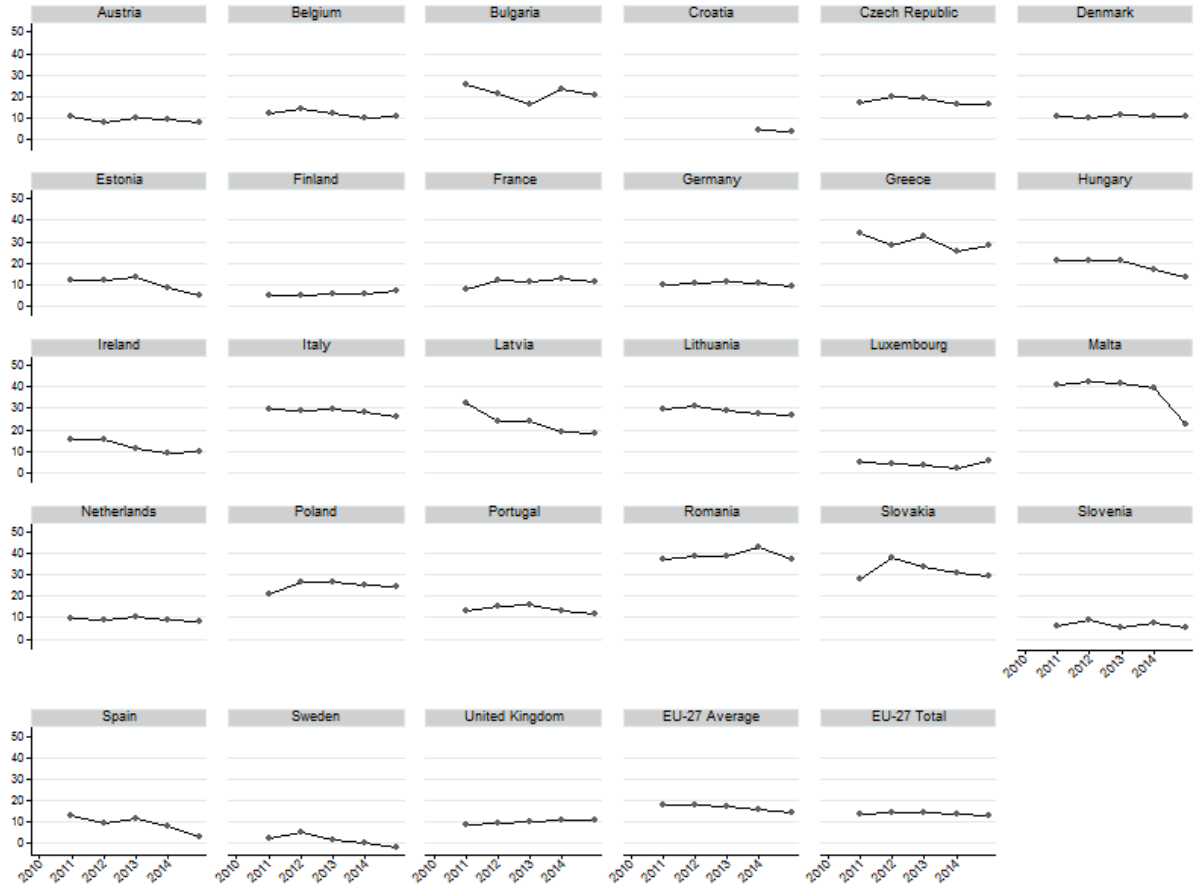
Source: own calculations.

Figure 2.2. Percentage Point Change in VAT Gap (2015 over 2014)



Source: own calculations.

Figure 2.3. VAT Gap in EU Member States, 2011–2015



Source: own calculations.

Table 2.1. VAT Gap Estimates, 2014–2015 (EUR million)

MS	2014				2015				VAT Gap Change (pp)
	Reve-nues	VTTL	VAT Gap	VAT Gap (%)	Reve-nues	VTTL	VAT Gap	VAT Gap (%)	
BE	27518	30496	2978	9.77	27547	30869	3323	10.76	0.99
BG	3810	4986	1176	23.59	4059	5111	1052	20.58	-3.01
CZ	11602	13916	2313	16.62	12382	14826	2444	16.48	-0.14
DK	24950	27868	2919	10.47	25470	28562	3092	10.83	0.36
DE	203081	227979	24898	10.92	211616	233982	22366	9.56	-1.36
EE	1711	1874	163	8.70	1873	1969	96	4.88	-3.82
IE	11521	12628	1106	8.76	11955	13275	1319	9.94	1.18
EL	12676	16966	4290	25.29	12885	17964	5079	28.27	2.98
ES	63643	69400	5757	8.30	68589	71092	2503	3.52	-4.78
FR	148454	170435	21981	12.90	151622	171735	20113	11.71	-1.19
HR	5368	5611	243	4.33	5689	5921	232	3.92	-0.41
IT	97071	135376	38305	28.30	101034	136127	35093	25.78	-2.52
CY					1517	1639	122	7.44	7.44
LV	1787	2207	420	19.03	1876	2287	411	17.97	-1.06
LT	2764	3816	1052	27.57	2888	3925	1037	26.42	-1.15
LU	3732	3823	90	2.35	3432	3634	202	5.56	3.21
HU	9754	11757	2003	17.04	10669	12369	1700	13.74	-3.30
MT	642	1063	421	39.60	684	883	199	22.54	-17.06
NL	42708	47050	4342	9.23	44879	48751	3872	7.94	-1.29
AT	25386	28084	2699	9.61	26232	28589	2357	8.24	-1.37
PL	29317	39032	9715	24.89	30075	39840	9765	24.51	-0.38
PT	14682	16914	2232	13.20	15368	17357	1989	11.46	-1.74
RO	11496	20116	8620	42.85	12939	20599	7659	37.18	-5.67
SI	3155	3411	256	7.51	3219	3406	188	5.52	-1.99
SK	5021	7227	2206	30.52	5420	7677	2256	29.39	-1.13
FI	18948	20159	1211	6.01	18974	20392	1418	6.95	0.94
SE	38846	38956	110	0.28	40501	39933	-568	-1.42	-1.70
UK	157478	176193	18715	10.62	181945	204156	22210	10.88	0.26
Total EU-27[10]	977121	1137342	160220	14.09	1033822	1185230	151408	12.77	-1.31
Total EU-28					1035339	1186869	151530	12.77	
Median				10.92				10.85	

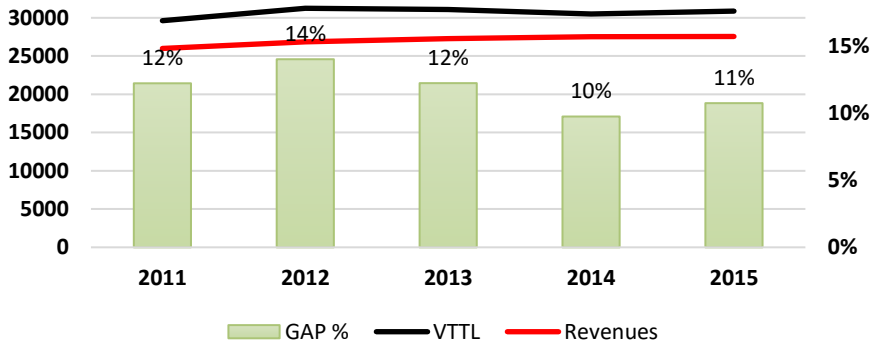
10 EU-28 without Cyprus.

3. Individual Country Results

This Chapter reviews the individual results for each EU-27 Member State, highlighting statistical trends and the most important changes in the particular VAT systems. The results are presented in the following order:

Table 3.1. Belgium: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Belgium	2011	2012	2013	2014	2015
VTTL	29604	31229	31057	30496	**30869**
o/w liability on household final consumption	16666	17219	17576	17480	**17870**
o/w liability on government and NPISH final consumption	1452	1482	1419	1441	**1469**
o/w liability on intermediate consumption	5983	6117	6278	5924	**6069**
o/w liability on GFCF	4007	4895	4725	4992	**5088**
o/w net adjustments	1496	1516	1059	660	**373**
VAT revenue	25979	26844	27250	27518	**27547**
VAT GAP	3625	4385	3807	2978	**3323**
VAT GAP as a percent of VTTL	12%	14%	12%	10%	**11%**
VAT GAP change since 2011					**- 1 pp**

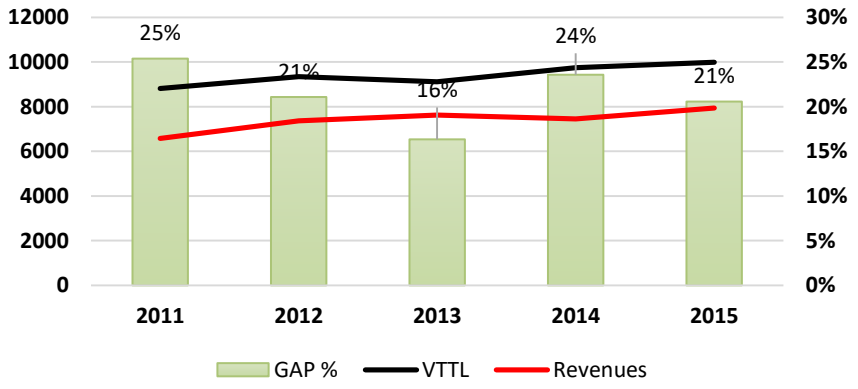


Highlights

- In the second half of 2015, the reduced rate on electricity for household consumption (implemented in 2014) was eliminated. The VTTL rebounded up 1 percent from a decline in 2014. However, VAT revenues remained stagnant, which led to a slight increase in the VAT Gap by 1 percentage point.

Table 3.2. Bulgaria: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (BGN million)

Bulgaria	2011	2012	2013	2014	2015
VTTL	8812	9340	9114	9751	**9997**
o/w liability on household final consumption	6577	7031	6648	6961	**7149**
o/w liability on government and NPISH final consumption	314	384	413	421	**393**
o/w liability on intermediate consumption	903	876	930	1118	**1070**
o/w liability on GFCF	905	935	1020	1164	**1295**
o/w net adjustments	113	114	103	87	**90**
VAT revenue	6575	7371	7624	7451	**7940**
VAT GAP	2237	1970	1490	2300	**2057**
VAT GAP as a percent of VTTL	25%	21%	16%	24%	**21%**
VAT GAP change since 2011					**-4 pp**

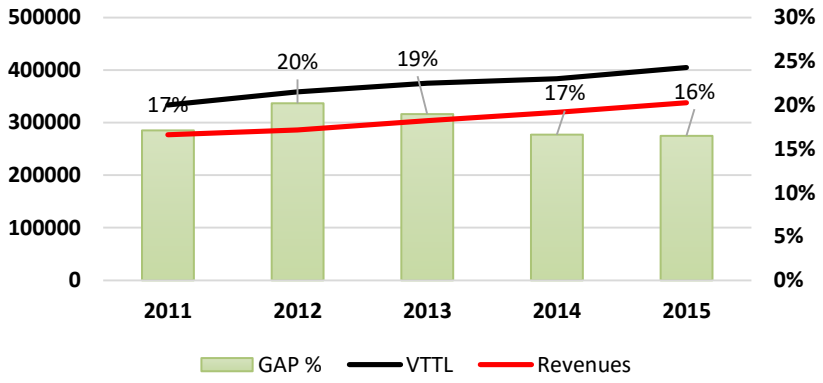


Highlights

- In 2015, Bulgaria's VAT revenue rebounded by 6 percent, after a 3 percent decline in 2014. The VTTL increased at a slower pace, which resulted in a 3 percentage point drop in the VAT Gap. However, it is still 5 percentage points above the minimum level reached in 2014.
- No systemic changes were introduced to the VAT system parameters in 2015.

Table 3.3. Czech Republic: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (CZK million)

Czech Republic	2011	2012	2013	2014	2015
VTTL	333607	358555	374939	383182	**404443**
o/w liability on household final consumption	208391	227951	241691	245538	**253480**
o/w liability on government and NPISH final consumption	16408	17834	18903	19387	**21485**
o/w liability on intermediate consumption	69164	67714	70455	70219	**72978**
o/w liability on GFCF	38706	44831	43902	48678	**56826**
o/w net adjustments	939	224	-12	-640	**-325**
VAT revenue	276533	286116	303823	319485	**337774**
VAT GAP	57074	72439	71116	63697	**66669**
VAT GAP as a percent of VTTL	17%	20%	19%	17%	**16%**
VAT GAP change since 2011					**-1 pp**

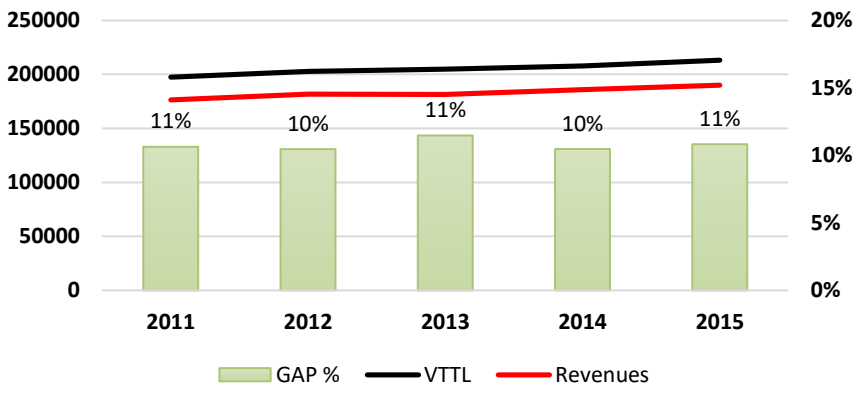


Highlights

- In 2015, the VAT Gap continued its downward trend for the fourth consecutive year.
- In 2015, the reverse charge mechanism was amended to extend to domestic sales of electronics and similar goods, a measure to deter the MTIC type of VAT fraud.
- Since 2014, fraudulent companies are publicly listed on tax authority websites. Moreover, in 2014, electronic VAT reporting became compulsory.

Table 3.4. Denmark: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (DKK million)

Denmark	2011	2012	2013	2014	2015
VTTL	197446	202841	204895	207753	**213038**
o/w liability on household final consumption	113365	117004	119265	120912	**124077**
o/w liability on government and NPISH final consumption	5182	5230	5222	5327	**5419**
o/w liability on intermediate consumption	49611	51888	51269	51860	**53032**
o/w liability on GFCF	24531	23656	23709	24421	**25128**
o/w net adjustments	4757	5064	5430	5234	**5381**
VAT revenue	176448	181618	181378	185994	**189974**
VAT GAP	20998	21223	23517	21759	**23064**
VAT GAP as a percent of VTTL	11%	10%	11%	10%	**11%**
VAT GAP change since 2011					**0 pp**

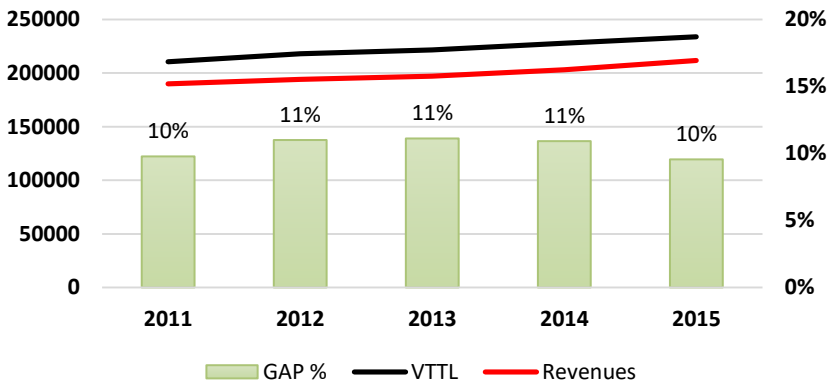


Highlights

- The VAT Gap for Denmark continues to fluctuate between 10 and 11 percent of the VTTL, increasing by merely 0.3 percentage points in 2015.
- Denmark did not implement any significant changes to VAT rates in 2015; however, in 2014, it extended its VAT reverse charge to domestic supplies of high value goods.

Table 3.5. Germany: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Germany	2011	2012	2013	2014	2015
VTTL	210499	218025	221654	227979	**233982**
o/w liability on household final consumption	134224	137795	139195	142349	**146246**
o/w liability on government and NPISH final consumption	5634	5694	5891	5801	**6053**
o/w liability on intermediate consumption	37000	37914	39101	40936	**41581**
o/w liability on GFCF	32277	35350	36084	37575	**38792**
o/w net adjustments	1363	1274	1384	1317	**1310**
VAT revenue	189910	194034	197005	203081	**211616**
VAT GAP	20589	23991	24649	24898	**22366**
VAT GAP as a percent of VTTL	10%	11%	11%	11%	**10%**
VAT GAP change since 2011					**0 pp**

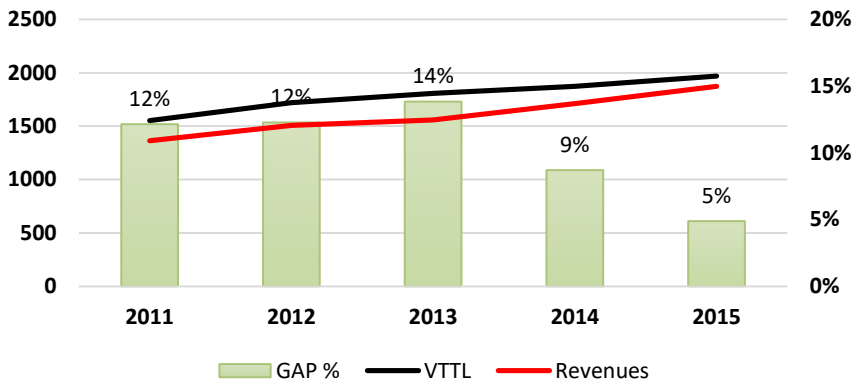


Highlights

- The nominal growth of VAT revenues increased from 3.1 percent to 4.2 percent in 2015, surpassing the 3.7 percent growth of gross national expenditures and the 2.6 percent growth of VTTL.
- The VAT Gap for Germany decreased 1 percentage point during 2015, or about EUR 2.5 billion. This amount comprised 29 percent of the total EU decrease in the VAT Gap.
- In 2014, Germany toughened penalties for late returns and unpaid VAT due and introduced a reverse charge on mobile phones. No substantial changes were made to the rate structure in 2015.

Table 3.6. Estonia: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Estonia	2011	2012	2013	2014	2015
VTTL	1551	1719	1808	1874	**1969**
o/w liability on household final consumption	1098	1202	1273	1322	**1378**
o/w liability on government and NPISH final consumption	15	16	26	28	**29**
o/w liability on intermediate consumption	209	219	222	229	**237**
o/w liability on GFCF	220	272	278	285	**315**
o/w net adjustments	10	10	8	9	**9**
VAT revenue	1363	1508	1558	1711	**1873**
VAT GAP	188	211	250	163	**96**
VAT GAP as a percent of VTTL	12%	12%	14%	9%	**5%**
VAT GAP change since 2011					**-7 pp**

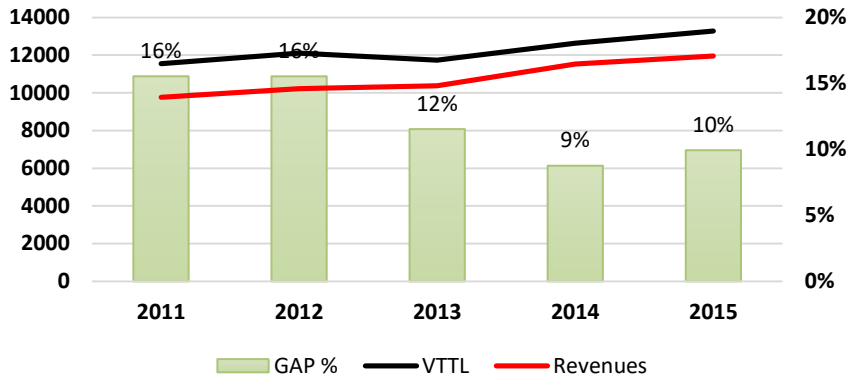


Highlights

- In 2015, Estonia experienced yet another remarkable decrease in VAT Gap for the second year in a row. As VTTL increased by 5 percent year to year, VAT revenues increased by 9 percent in nominal terms. As a result, the VAT Gap dropped below EUR 100 million, or less than 5 percent of the VTTL.
- No substantial changes were introduced to the VAT structure in 2015.
- In 2014, several new measures, namely, a single database and a new system for digital invoice collection targeting tax evasion and fraud were introduced.

Table 3.7. Ireland: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Ireland	2011	2012	2013	2014	2015
VTTL	11550	12099	11725	12628	**13275**
o/w liability on house-hold final consumption	7127	7405	7281	7520	**7973**
o/w liability on government and NPISH final consumption	224	232	181	176	**185**
o/w liability on intermediate consumption	2742	3229	3072	3490	**3485**
o/w liability on GFCF	1304	1079	1031	1289	**1468**
o/w net adjustments	153	154	160	153	**165**
VAT revenue	9755	10219	10372	11521	**11955**
VAT GAP	1795	1880	1353	1106	**1319**
VAT GAP as a percent of VTTL	16%	16%	12%	9%	**10%**
VAT GAP change since 2011					**-6 pp**

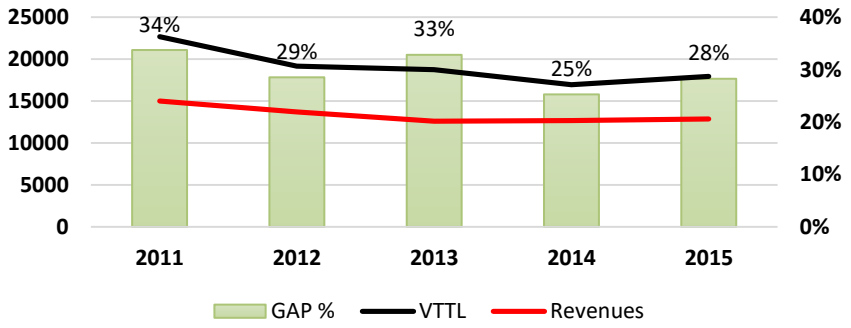


Highlights

- Ireland's VAT Gap stabilised at the 10 percent level in 2015, after falling 7 percentage points from 2012 to 2014.
- In 2014, the Irish government introduced several measures through its Finance Bill to improve VAT compliance, such as the VAT Fraud Quick Reaction Response Mechanism.
- No substantial changes to VAT structure occurred in 2015.

Table 3.8. Greece: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Greece	2011	2012	2013	2014	2015
VTTL	22677	19192	18751	16966	**17964**
o/w liability on household final consumption	16125	14017	13498	12381	**13199**
o/w liability on government and NPISH final consumption	876	819	582	431	**567**
o/w liability on intermediate consumption	2001	1886	1722	1598	**1676**
o/w liability on GFCF	3307	2220	2682	2312	**2256**
o/w net adjustments	368	250	267	244	**266**
VAT revenue	15021	13713	12593	12676	**12885**
VAT GAP	7656	5479	6158	4290	**5079**
VAT GAP as a percent of VTTL	34%	29%	33%	25%	**28%**
VAT GAP change since 2011					-6 pp

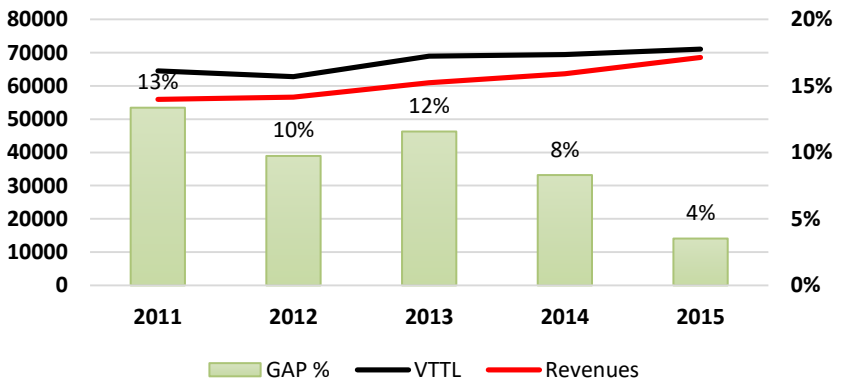


Highlights

- In 2015, Greek real GDP continued its contraction, having fallen almost 10 percent since 2011.
- In July 2015, several VAT rates were raised as a measure to increase revenue. The super reduced rate for accommodation was raised to the reduced level, and the rates on several food products, fertilisers, and other goods were raised to the full level. Also, the mainland rate was set on five islands that previously had 30 percent lower rates.
- These two opposing factors resulted in EUR 1 billion of additional VTTL. However, actual revenues increased by only EUR 200 million. Hence, the VAT Gap increased by 3 percentage points, from 25 to 28 percent.

Table 3.9a. Spain: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Spain	2011	2012	2013	2014	2015
VTTL	64526	62761	68926	69400	**71092**
o/w liability on household final consumption	44891	46291	50150	50979	**52568**
o/w liability on government and NPISH final consumption	2454	2273	2387	2376	**2447**
o/w liability on intermediate consumption	8468	8253	8639	8377	**8331**
o/w liability on GFCF	8463	5632	7353	7241	**7279**
o/w net adjustments	250	313	398	427	**467**
VAT revenue	55904	56652	60951	63643	**68589**
VAT GAP	8622	6109	7975	5757	**2503**
VAT GAP as a percent of VTTL	13%	10%	12%	8%	**4%**
VAT GAP change since 2011					**-9 pp**



Highlights

- Trends in 2015 were similar to those of 2014. The VAT Gap continued its decline due to strong revenue performance. Overall, the 8 percent growth in revenue can be decomposed into a 3 percent increase in the net base and a 5 percent increase in VAT compliance.
- In 2015, a VAT deferral regime was introduced for large importers.

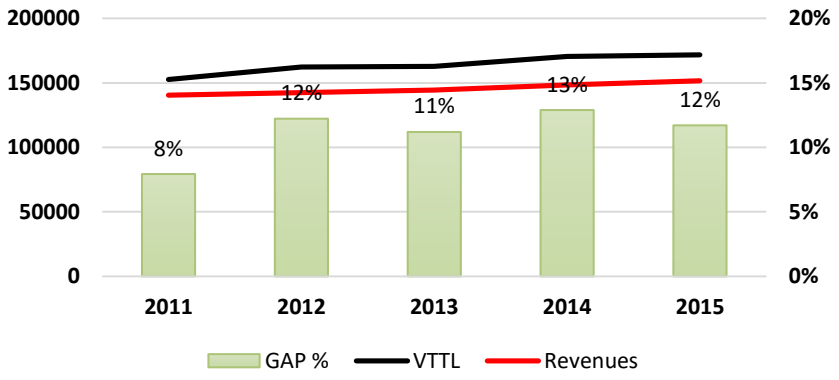
Table 3.9b. Spain: Alternative Estimates

Spain	2011	2012	2013	2014	2015
VAT Gap based on alternative data	7150	4417	4337	2645	1120
VAT Gap based on alternative data, as a percent of VTTL	11%	7%	6%	4%	2%

Note: Adjusting revenues for the continuing reduction in the stock of claims and adjusting the VTTL for the difference between national accounting and tax conventions in the construction sector based on the data received from Spanish Tax Authorities led to a downward revision of the VAT Gap for the entire period 2011–2015.

Table 3.10. France: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

France	2011	2012	2013	2014	2015
VTTL	152667	162380	162708	170435	**171735**
o/w liability on household final consumption	94180	96942	96958	101684	**103383**
o/w liability on government and NPISH final consumption	1292	1379	1426	1561	**1577**
o/w liability on intermediate consumption	24610	25760	26230	27120	**27499**
o/w liability on GFCF	28103	33496	33133	34634	**33988**
o/w net adjustments	4482	4802	4961	5436	**5288**
VAT revenue	140552	142527	144490	148454	**151622**
VAT GAP	12115	19853	18218	21981	**20113**
VAT GAP as a percent of VTTL	8%	12%	11%	13%	**12%**
VAT GAP change since 2011					**+4 pp**

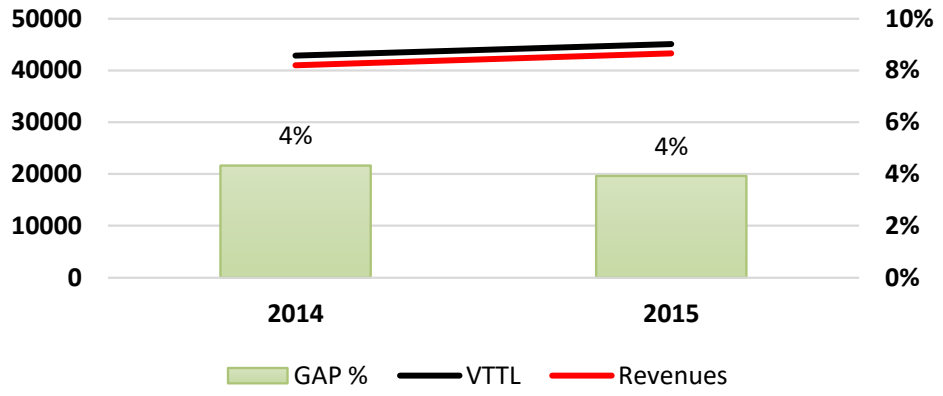


Highlights

- The VAT Gap in France has been fluctuating around 12 percent since 2012, after the 4 percentage point surge in 2011.
- A stagnant base and a moderate 2 percent increase in VAT revenue contributed to a 1 percentage point reduction in the VAT Gap in 2015.
- In January 2015, France extended electronic audit filing to non-resident VAT companies. Previously, this was only required from resident companies.

Table 3.11. Croatia: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2014–2015 (HRK million)

Croatia	2014	2015
VTTL	42835	45084
o/w liability on household final consumption	31244	32017
o/w liability on government and NPISH final consumption	1723	1690
o/w liability on intermediate consumption	5421	6782
o/w liability on GFCF	4288	4032
o/w net adjustments	159	564
VAT revenue	40983	43315
VAT GAP	1853	1769
VAT GAP as a percent of VTTL	4%	4%

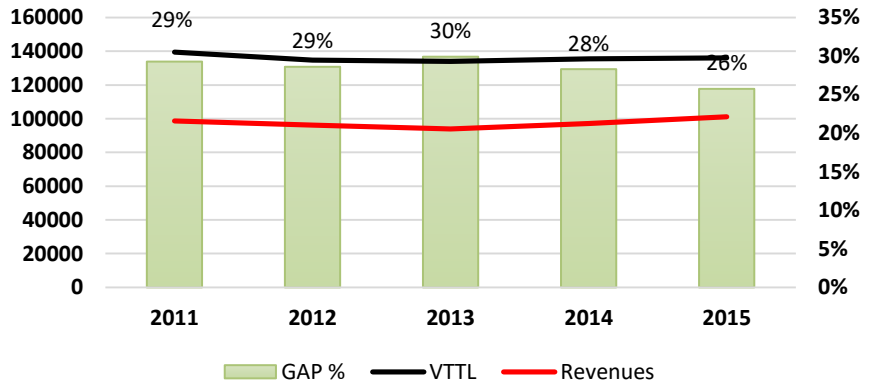


Highlights

- Croatian estimates are available as of 2014, following the publication of ESA10 standard national accounts data.
- The VAT Gap estimate for 2014 was revised downward since the previous VAT Gap report due to the correction of the weighted average rate calculation.
- The VAT Gap in Croatia decreased marginally by 0.4 percentage points in 2015.

Table 3.12a. Italy: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Italy	2011	2012	2013	2014	2015
VTTL	139468	134560	133986	135376	**136127**
o/w liability on household final consumption	99560	97624	95936	97871	**99158**
o/w liability on government and NPISH final consumption	1982	2098	2095	2070	**2003**
o/w liability on intermediate consumption	18296	17716	18282	18478	**18460**
o/w liability on GFCF	15035	12770	13564	13212	**13370**
o/w net adjustments	4594	4353	4108	3745	**3136**
VAT revenue	98650	96170	93921	97071	**101034**
VAT GAP	40818	38390	40065	38305	**35093**
VAT GAP as a percent of VTTL	29%	29%	30%	28%	**26%**
VAT GAP change since 2011					**-3 pp**



Highlights

- No systemic changes to the applicable rates were introduced to the Italian VAT system in 2015.
- As a measure to combat fraud, the VAT split payments system was implemented in 2015 through the "Italian Stability Law". It requires public bodies to pay VAT directly into a special Treasury bank account.
- In November 2015, a domestic reverse charge was imposed on sales of laptops, game consoles, and computer tablets.
- The VAT Gap for Italy decreased by 2 percentage points in 2015.

Table 3.12b. Italy: Alternative Estimates

Italy	2011	2012	2013	2014	2015
VAT Gap based on alternative data	41750	36810	37460	36856	35879
VAT Gap based on alternative data, as a percent of VTTL	30%	27%	28%	27%	26%

Note: the estimates above are based on adjusted revenues for the changes in outstanding stocks of net reimbursement claims (to better approximate accrued revenues) and Italy's own estimates of illegal activities, namely illegal drugs and prostitution activities.

Table 3.13. Cyprus: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2015 (EUR million)

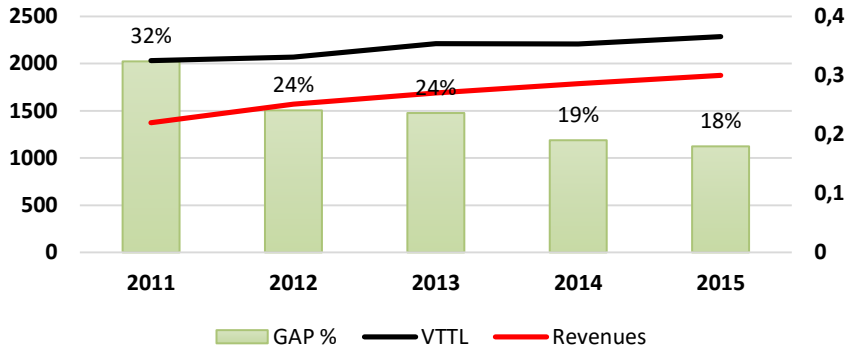
Cyprus	2015
VTTL	1639
o/w liability on household final consumption	1034
o/w liability on government and NPISH final consumption	27
o/w liability on intermediate consumption	416
o/w liability on GFCF	141
o/w net adjustments	21
VAT revenue	1517
VAT GAP	122
VAT GAP as a percent of VTTL	7%

Highlights

- Thanks to the finalisation of national accounts and figures in the ESA10 standard, estimates for Cyprus are included in the VAT Gap Report as of 2015.
- Cyprus' VAT Gap in 2015 is estimated to be 7 percent, which is 3 percentage points below the EU average.

Table 3.14. Latvia: VAT Revenue VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Latvia	2011	2012	2013	2014	2015
VTTL	2032	2068	2213	2207	**2287**
o/w liability on household final consumption	1555	1633	1679	1715	**1770**
o/w liability on government final consumption	44	47	44	45	**47**
o/w liability on intermediate consumption	303	296	317	325	**341**
o/w liability on GFCF	196	194	278	238	**246**
o/w net adjustments	-65	-102	-105	-117	**-116**
VAT revenue	1374	1570	1690	1787	**1876**
VAT GAP	658	498	523	420	**411**
VAT GAP as a percent of VTTL	32%	24%	24%	19%	**18%**
VAT GAP change since 2011					**-14 pp**

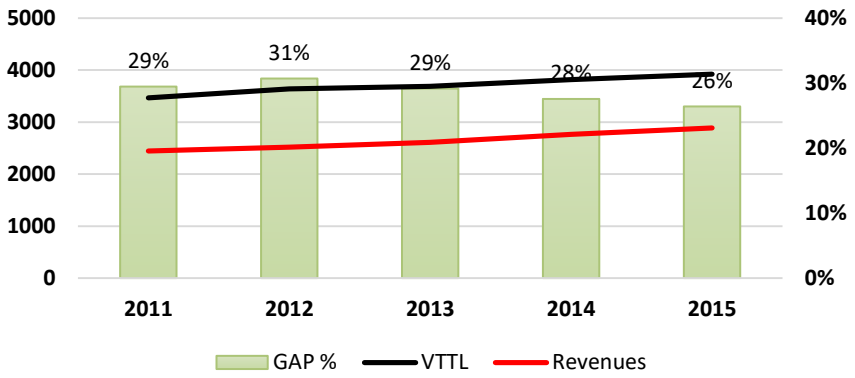


Highlights

- The VAT Gap in Latvia continued its downward trend and decreased 1 percentage point further in 2015. Since 2011, the VAT Gap has decreased by 14 percentage points.
- The previously published estimates for Latvia were revised in the current report due to the publication of updated SUT and national accounts data.
- There were no substantial changes to VAT legislation in 2015.
- Earlier in 2014, a new register of "high risk" entities was created with an obligation for the tax authorities to provide information on such individuals to the commercial register.

Table 3.15. Lithuania: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Lithuania	2011	2012	2013	2014	2015
VTTL	3465	3638	3686	3816	**3925**
o/w liability on household final consumption	2788	2941	3010	3132	**3232**
o/w liability on government and NPISH final consumption	74	68	66	69	**73**
o/w liability on intermediate consumption	341	377	341	375	**372**
o/w liability on GFCF	372	378	398	415	**454**
o/w net adjustments	-110	-126	-129	-174	**-206**
VAT revenue	2444	2521	2611	2764	**2888**
VAT GAP	1021	1117	1075	1052	**1037**
VAT GAP as a percent of VTTL	29%	31%	29%	28%	**26%**
VAT GAP change since 2011					**-3 pp**

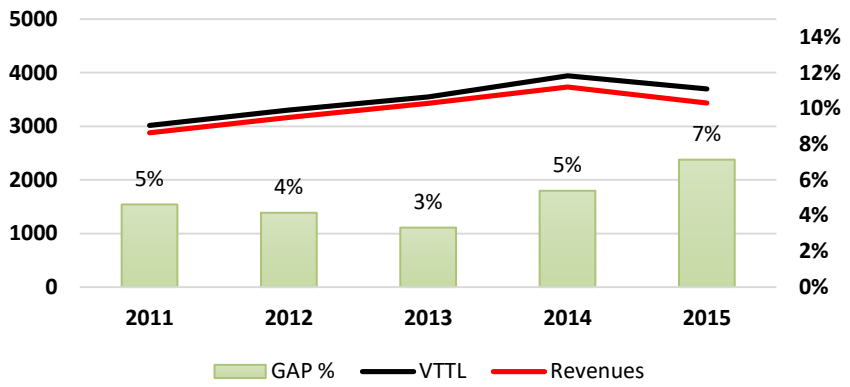


Highlights

- The estimates for Lithuania were revised significantly downward with respect to the 2016 Report due to the correction of the methodology in the application of SUT data.
- The VAT Gap in Lithuania continues a downward trend since 2012, having decreased by another 2 percentage points in 2015.
- The rate for accommodation was lowered to 9 percent in 2015.

Table 3.16. Luxembourg: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Luxembourg	2011	2012	2013	2014	2015
VTTL	3019	3301	3544	3823	**3634**
o/w liability on household final consumption	1079	1131	1143	1181	**1452**
o/w liability on government and NPISH final consumption	30	33	31	31	**34**
o/w liability on intermediate consumption	563	573	611	691	**904**
o/w liability on GFCF	305	317	306	319	**382**
o/w net adjustments	1041	1247	1453	1601	**862**
VAT revenue	2879	3164	3429	3732	**3432**
VAT GAP	140	137	115	90	**202**
VAT GAP as a percent of VTTL	5%	4%	3%	2%	**6%**
VAT GAP change since 2011					**+1 pp**

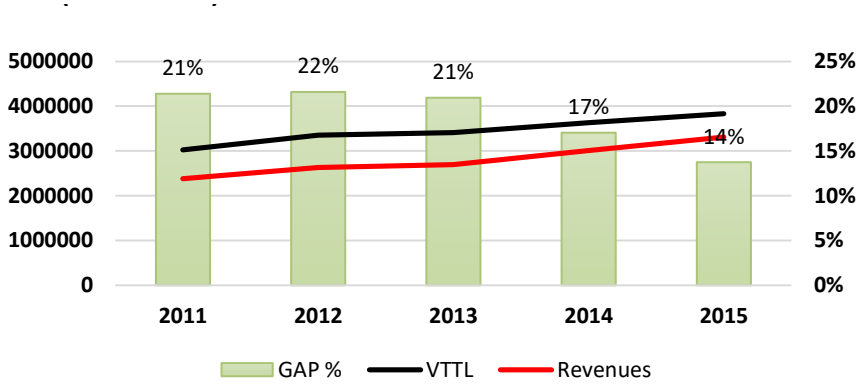


Highlights

- In 2015, Luxembourg VAT revenue suffered a EUR 738 million loss due to the introduction of the MOSS regime. MOSS obliged VAT from electronic services to be paid to the country of customer residence.
- Standard, reduced, and parking rates were increased by 2 percentage points in 2015 to partly offset the anticipated loss of revenue.
- Total liability contracted by about 5 percent in 2015; however, actual revenues dropped 8 percent. The VAT Gap increased to 6 percent of the VTTL.

Table 3.17. Hungary: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (HUF million)

Hungary	2011	2012	2013	2014	2015
VTTL	3026487	3351065	3407061	3629657	**3834330**
o/w liability on household final consumption	2160869	2381684	2439438	2524595	**2612814**
o/w liability on government final consumption	122279	116969	122358	133364	**139925**
o/w liability on intermediate consumption	415184	446366	429682	465428	**490771**
o/w liability on GFCF	299953	338232	362648	455410	**543345**
o/w net adjustments	28201	67815	52935	50859	**47475**
VAT revenue	2379253	2627571	2693555	3011162	**3307312**
VAT GAP	647234	723495	713506	618495	**527019**
VAT GAP as a percent of VTTL	21%	22%	21%	17%	**14%**
VAT GAP change since 2011					**-7 pp**

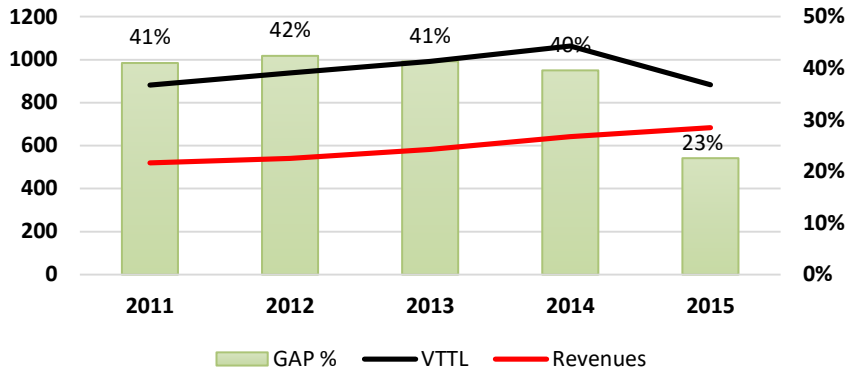


Highlights

- VAT compliance continued to improve in 2015, with the VAT Gap falling by a further 3 percentage points. Hungary remained the Member State with the highest standard rate (27 percent).
- In 2015, Hungary continued to introduce additional anti-fraud measures:
- All intra-EU movements of goods by road transport must be declared in the electronic EKAER system;
- A domestic reverse charge was introduced for steel products; and
- The threshold for reporting domestic recapitulative statements is lowered for invoices from HUF 2 to 1 million.

Table 3.18. Malta: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Malta	2011	2012	2013	2014	2015
VTTL	882	938	992	1063	**883**
o/w liability on household final consumption	386	412	429	448	**474**
o/w liability on government and NPISH final consumption	13	15	15	17	**17**
o/w liability on intermediate consumption	445	465	496	542	**318**
o/w liability on GFCF	37	45	50	55	**71**
o/w net adjustments	1	1	3	2	**3**
VAT revenue	520	540	582	642	**684**
VAT GAP	362	398	410	421	**199**
VAT GAP as a percent of VTTL	41%	42%	41%	40%	**23%**
VAT GAP change since 2011					**-18 pp**

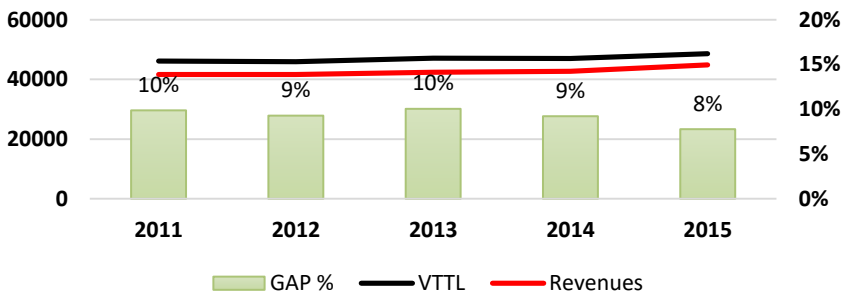


Highlights

- The new "place of supply by the residence of customer" rule for electronic services had a negative effect on the intermediate consumption liability of Malta's e-gambling industry by making a part of the input VAT recoverable (see Section a in Annex A).
- As a result of the decline in VTTL, there was a considerable drop in the VAT Gap in 2015 to 23 percent. However, it remains 13 percentage points higher than the EU average of 10 percent.
- VAT on e-books was lowered to 5 percent in 2015.

Table 3.19a. Netherlands: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Netherlands	2011	2012	2013	2014	2015
VTTL	46173	45971	47166	47050	**48751**
o/w liability on household final consumption	24285	24745	25882	25363	**25952**
o/w liability on government and NPISH final consumption	615	586	565	556	**554**
o/w liability on intermediate consumption	12054	12330	13000	13121	**13348**
o/w liability on GFCF	8750	7824	7205	7502	**8389**
o/w net adjustments	469	487	514	508	**507**
VAT revenue	41610	41699	42424	42708	**44879**
VAT GAP	4563	4272	4742	4342	**3872**
VAT GAP as a percent of VTTL	10%	9%	10%	9%	**8%**
VAT GAP change since 2011					**-2 pp**



Highlights

- The VAT Gap in the Netherlands fluctuated around 9-10 percent during 2011–2014, decreasing slightly in 2015, as the growth of revenues outpaced the growth of the VTTL.
- During the course of 2015, the 6 percent reduced rate for the renovation and repair of buildings was increased to the standard 21 percent rate. There were no other substantial changes implemented in the VAT structure.

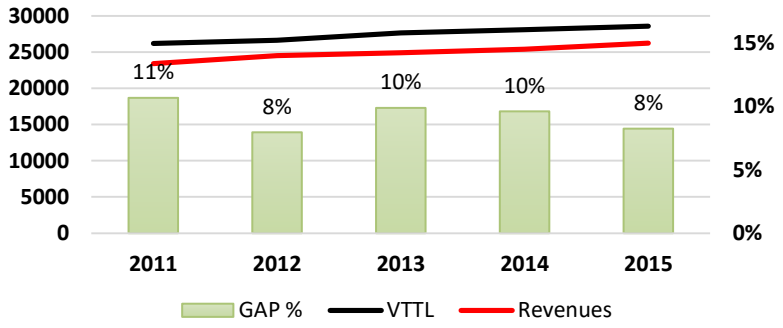
Table 3.19b. Netherlands: Alternative Estimates

Netherlands	2011	2012	2013	2014	2015
VAT Gap based on alternative data	4023	3724	4168	3772	**3296**
VAT Gap based on alternative data, as a percent of VTTL	9%	8%	9%	8%	**7%**

Note: These estimates are obtained under alternative assumptions regarding the limited right to deduct benefits in kind and business entertainment, which are limited to EUR 227 per employee annually. To calculate a lower bound estimate of the VAT Gap, we assume that such deductions were applied to all employees currently working in Netherlands.

Table 3.20. Austria: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Austria	2011	2012	2013	2014	2015
VTTL	26189	26625	27624	28084	**28589**
o/w liability on household final consumption	17767	18307	18995	19305	**19470**
o/w liability on government and NPISH final consumption	778	794	758	951	**986**
o/w liability on intermediate consumption	3626	3750	3888	3956	**4091**
o/w liability on GFCF	2477	2296	2545	2562	**2621**
o/w net adjustments	1541	1477	1438	1310	**1421**
VAT revenue	23394	24507	24895	25386	**26232**
VAT GAP	2795	2118	2730	2699	**2357**
VAT GAP as a percent of VTTL	11%	8%	10%	10%	**8%**
VAT GAP change since 2011					**-3 pp**

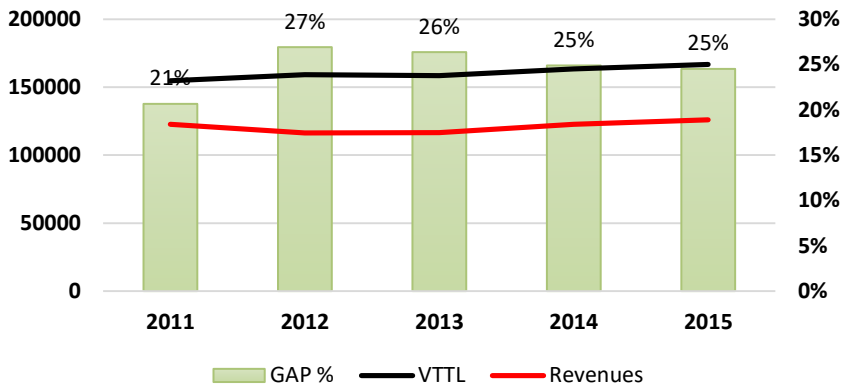


Highlights

- The VAT Gap in Austria averaged 9.2 percent over the five year period.
- In 2015, the VAT Gap decreased by 1.4 percentage points.
- During 2014, Austria introduced reverse VAT charges on a range of goods, including: the supply of gas and electricity, the supply of precious metals, and sales of laptops, tablets, and games consoles.
- There were no major changes in the VAT rules during 2015.

Table 3.21. Poland: VAT Revenue VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (PLN million)

Poland	2011	2012	2013	2014	2015
VTTL	154570	159072	158351	163321	**166694**
o/w liability on household final consumption	102061	108658	109749	112706	**114645**
o/w liability on government and NPISH final consumption	6737	6864	6716	7005	**7269**
o/w liability on intermediate consumption	22252	22923	22385	23723	**24950**
o/w liability on GFCF	19524	16423	15306	16938	**17522**
o/w net adjustments	3996	4203	4195	2949	**2308**
VAT revenue	122647	116265	116607	122671	**125836**
VAT GAP	31923	42807	41744	40650	**40858**
VAT GAP as a percent of VTTL	21%	27%	26%	25%	**25%**
VAT GAP change since 2011					**+4 pp**

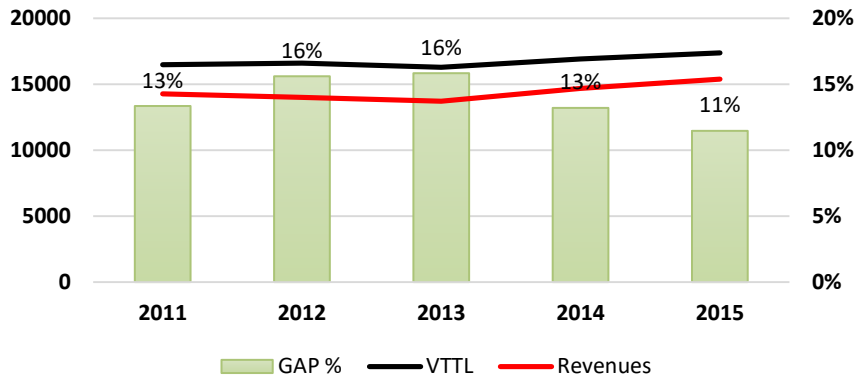


Highlights

- Since 2012, the VAT Gap fell by approximately PLN 2 billion and 2 percentage points of the VTTL. However, it remained almost unchanged in 2015.
- Reverse charges on the sales of laptops, mobile phones, and tablets were introduced in July 2015.
- Several measures concerning tax compliance and efficiency were introduced in 2014. In particular, the government consolidated organisational functions and introduced a single database of tax identification numbers.

Table 3.22. Portugal: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Portugal	2011	2012	2013	2014	2015
VTTL	16461	16581	16288	16914	**17357**
o/w liability on household final consumption	11432	12371	12239	12818	**13112**
o/w liability on government and NPISH final consumption	264	223	219	218	**265**
o/w liability on intermediate consumption	2773	2646	2606	2649	**2673**
o/w liability on GFCF	1665	981	887	894	**955**
o/w net adjustments	328	359	336	334	**352**
VAT revenue	14265	13995	13710	14682	**15368**
VAT GAP	2196	2586	2578	2232	**1989**
VAT GAP as a percent of VTTL	13%	16%	16%	13%	**11%**
VAT GAP change since 2011					**-2 pp**

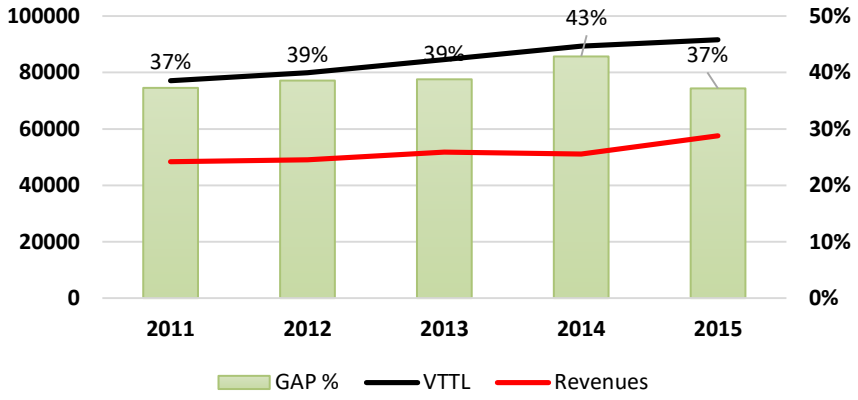


Highlights

- Portugal's VAT Gap decreased by over 3 percentage points in 2014 to its lowest level since 2011. Roughly half of the growth of VAT revenue can be attributed to the growing economy, with the other half due to increased VAT compliance.
- No substantial changes were introduced to the VAT regime in 2015.

Table 3.23. Romania: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (RON million)

Romania	2011	2012	2013	2014	2015
VTTL	77123	79881	84547	89390	**91569**
o/w liability on household final consumption	46751	49115	49611	54031	**55053**
o/w liability on government and NPISH final consumption	3943	4932	4502	4625	**4658**
o/w liability on intermediate consumption	7870	7823	7674	9548	**9106**
o/w liability on GFCF	15762	15105	20944	18266	**19915**
o/w net adjustments	2797	2906	1816	2920	**2836**
VAT revenue	48375	49066	51745	51086	**57520**
VAT GAP	28749	30815	32802	38304	**34049**
VAT GAP as a percent of VTTL	37%	39%	39%	43%	**37%**
VAT GAP change since 2011					**0 pp**

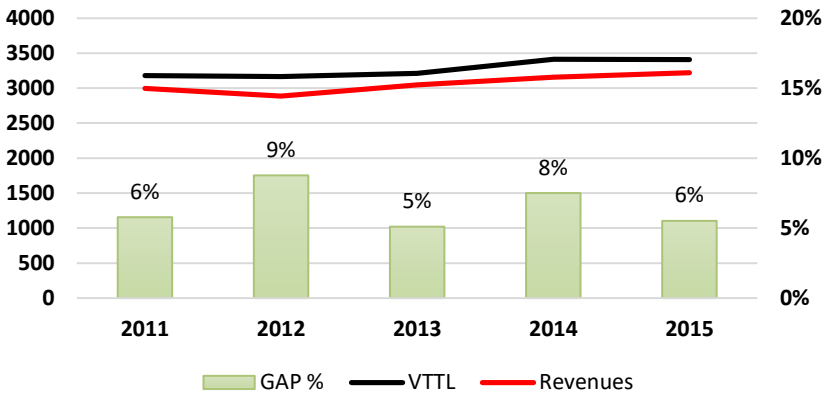


Highlights

- In 2015, VAT revenues increased by a record level of 12.6 percent per year, twice as high as nominal GDP growth. The estimated VAT Gap returned to its 2011 level. However, Romania's VAT Gap of 37 percent remains one of the highest in the EU.
- In 2014, the reverse charge mechanism was introduced by the Romanian government for the supply of energy, for green certificates, and in the wood industry.
- In 2015, the VAT rate for touristic services was lowered to 9 percent. There were no other substantial changes.

Table 3.24. Slovenia: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Slovenia	2011	2012	2013	2014	2015
VTTL	3179	3165	3209	3411	**3406**
o/w liability on household final consumption	2271	2285	2284	2412	**2411**
o/w liability on government and NPISH final consumption	65	61	62	63	**64**
o/w liability on intermediate consumption	407	410	428	445	**453**
o/w liability on GFCF	322	303	334	403	**399**
o/w net adjustments	113	106	101	88	**78**
VAT revenue	2995	2888	3046	3155	**3219**
VAT GAP	184	277	164	256	**188**
VAT GAP as a percent of VTTL	6%	9%	5%	8%	**6%**
VAT GAP change since 2011					**0 pp**

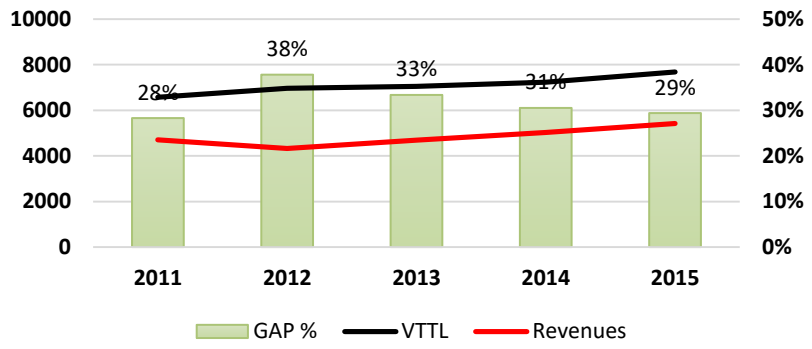


Highlights

- During the 2011-2015 period, the VAT Gap in Slovenia fluctuated around the average level of 6.5 percent.
- A moderate increase in VAT revenues combined with stagnant expenditures resulted in the 2 percentage point decrease of the VAT Gap in 2015.
- In 2015, the reverse charge mechanism was introduced for domestic sales on carbon trading transactions as an anti-VAT fraud measure.
- In 2015, Slovenia remained among the top five Member States with the lowest VAT Gap in the EU.

Table 3.25. Slovakia: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Slovakia	2011	2012	2013	2014	2015
VTTL	6570	6960	7048	7227	**7677**
o/w liability on household final consumption	4873	5029	5101	5239	**5357**
o/w liability on government final consumption	249	238	308	326	**345**
o/w liability on intermediate consumption	822	928	903	932	**997**
o/w liability on GFCF	607	745	725	751	**994**
o/w net adjustments	19	19	11	-22	**-17**
VAT revenue	4711	4328	4696	5021	**5420**
VAT GAP	1859	2632	2352	2206	**2256**
VAT GAP as a percent of VTTL	28%	38%	33%	31%	**29%**
VAT GAP change since 2011					**+1 pp**

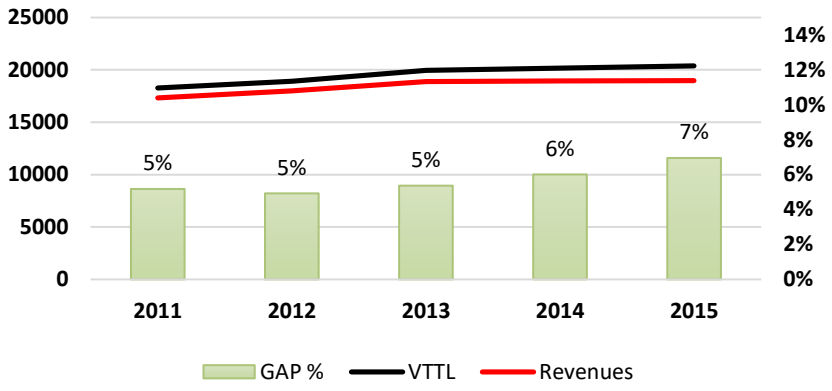


Highlights

- The VAT Gap in Slovakia continued its decrease in 2015 since its peak in 2012. In 2015, the VAT Gap fell by an additional 2 percentage points, with growth in revenues more than twice as high as growth in nominal GDP and VTTL.
- No substantial changes were made to the VAT regime in 2015.
- Several measures to improve VAT compliance were introduced earlier in 2014.
- Among others, Slovakia's 2014 tax reforms included a wider introduction of cash registers. Furthermore, starting from the fourth quarter of 2013, the government launched the VAT receipt lottery.

Table 3.26. Finland: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (EUR million)

Finland	2011	2012	2013	2014	2015
VTTL	18261	18919	19959	20159	**20392**
o/w liability on household final consumption	10154	10513	11041	11074	**11323**
o/w liability on government and NPISH final consumption	367	372	456	465	**468**
o/w liability on intermediate consumption	3895	3987	4293	4433	**4453**
o/w liability on GFCF	3295	3570	3622	3583	**3537**
o/w net adjustments	550	478	547	604	**610**
VAT revenue	17315	17987	18888	18948	**18974**
VAT GAP	946	932	1071	1211	**1418**
VAT GAP as a percent of VTTL	5%	5%	5%	6%	**7%**
VAT GAP change since 2011					**+2 pp**

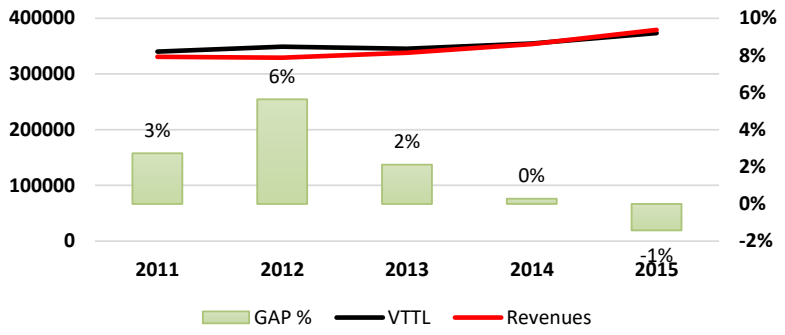


Highlights

- Finland's VAT Gap continued to increase its share in the VTTL. Despite this unfavourable trend, Finland, with its 6.9 percent Gap, remains one of the countries with the best VAT compliance in the EU.
- No systemic changes were introduced to the parameters of the Finnish VAT system in 2015.

Table 3.27. Sweden: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (SEK million)

Sweden	2011	2012	2013	2014	2015
VTTL	340051	348981	345128	354439	**373516**
o/w liability on household final consumption	181072	185455	182692	188167	**195314**
o/w liability on government and NPISH final consumption	15297	18716	19263	16245	**17115**
o/w liability on intermediate consumption	81901	81284	81022	83875	**90383**
o/w liability on GFCF	54675	55764	56775	60228	**64441**
o/w net adjustments	7105	7762	5377	5924	**6264**
VAT revenue	330770	329311	337823	353439	**378830**
VAT GAP	9281	19670	7305	1000	**-5314**
VAT GAP as a percent of VTTL	3%	6%	2%	0%	**-1%**
VAT GAP change since 2011					**-4 pp**

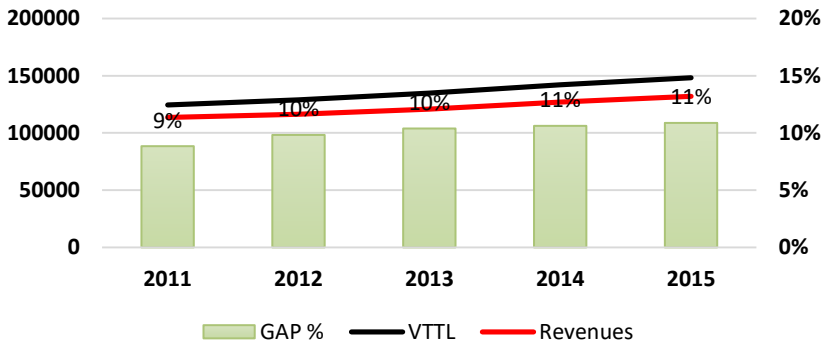


Highlights

- In 2013 and 2014, Sweden recorded the lowest VAT Gap in the EU-27, approaching a nil VAT Gap in 2014.
- Due to the record 7 percent growth in revenues combined with the much more moderate 4 percent growth in the net base, Sweden's VAT revenues exceeded the estimated VTTL in 2015. Of the SEK 25.5 billion increase in revenues, SEK 14 billion can be attributed to the decline in VAT refunds remitted by the state.
- Since 2015, import VAT is invoiced directly to the Tax Authority instead of the Customs Authority.
- Possible reasons for negative VAT Gap: use of cash vs accrual revenues, under-estimation of GFCF liabilities, or incompleteness of national accounts.

Table 3.28. United Kingdom: VAT Revenue, VTTL, Composition of VTTL, and VAT Gap, 2011–2015 (GBP million)

United Kingdom	2011	2012	2013	2014	2015
VTTL	124553	128958	134792	142033	**148184**
o/w liability on household final consumption	82373	85172	88706	94064	**99409**
o/w liability on government and NPISH final consumption	2597	2556	2537	2618	**3131**
o/w liability on intermediate consumption	29271	28730	29021	29773	**30805**
o/w liability on GFCF	8578	10267	11436	13317	**13614**
o/w net adjustments	1734	2233	3091	2262	**1226**
VAT revenue	113534	116283	120784	126946	**132063**
VAT GAP	11019	12675	14008	15087	**16121**
VAT GAP as a percent of VTTL	9%	10%	10%	11%	**11%**
VAT GAP change since 2011					**+2 pp**



Highlights

- The VAT Gap in the UK remained stable in 2015, increasing over the year by just 0.3 percentage points. Over the course of the entire period (2011-2015), the share of the VAT Gap increased by 2 percentage points.
- The VAT Gap in the UK is equal to the median Gap of EU-28 Member States.
- No substantial changes were made to the VAT regime in the UK throughout 2015.

4. Policy Gap Measures

In this Chapter, we present an update of the series of estimates of the Policy Gap and its components for the EU-28.

As discussed in *2016 Report*, the Policy Gap captures the effects of applying multiple rates and exemptions on the theoretical revenue that could be levied in a given VAT system. In other words, the Policy Gap is an indicator of the additional VAT revenue that a Member State could theoretically (i.e. in the case of perfect tax compliance) generate if it applied a uniform VAT rate on all goods and services. Due to the idealistic assumption of perfect tax compliance, the practical interpretation of the Policy Gap draws criticism. Nonetheless, the assumption of perfect VAT collectability is indispensable, as interdependencies between tax compliance and rate structure are not straightforward. Furthermore, the example of the negative VAT Gap in Sweden shows that the assumption of perfect tax compliance is not as idealistic as it may seem.

The Policy Gap could be further decomposed into different components of revenue loss, as we show in Section f in Annex A. Such elements are, for instance, the Rate Gap and the Exemption Gap, which capture the loss in VAT liability due to the application of reduced rates, and the loss in liability due to the implementation of exemptions.

Moreover, following Barbone et al. (2013), the Policy Gap and its components could be further adjusted to address the issue of the extent to which the loss of theoretical revenue depends on the decision of policymakers. Measures that exclude liability from the final consumption of "imputed rents" (the notional value of home occupancy by home-owners), financial services, and the provision of public goods and services, as charging them with VAT is impractical or beyond the control of national authorities, are named the "Action-able Gaps".

Results for 2015

The estimates of the Policy Gap, Rate Gap, Exemption Gap, Actionable Policy Gap, and Actionable Exemption Gap for the EU-28 Member States are presented in Table 4.1.

For the EU overall, the average Policy Gap level is 44 percent. In other words, VAT from final consumption and investment, even in the case of 100 percent compliance, generates just slightly more than half of what it could bring if taxed uniformly at the full rate. Of this 44 percent, 9 percentage points are due to the application of various reduced and super reduced rates (the Rate Gap). Countries with the most flat level of rates in the EU, according to the Rate Gap, are Denmark, Slovakia, Estonia, and Bulgaria. Installing a uniform Standard Rate would generate less than 3 percent of notional additional revenue in these countries. On the other side of spectrum are countries with the highest Rate Gap: Cyprus' revenue could increase by more than 30 percent, and in Italy, Poland, and Spain by about 15 percent, if only the Standard Rate were applied.

The Exemption Gap, or the average share of Ideal Revenue lost due to various exemptions, is 35 percent in the EU on average. Member States with the highest Exemption Gap are Spain (44.93 percent), UK (43.44 percent) and Finland (43.25 percent), whereas the lowest value of the Gap was observed in Cyprus (15.20 percent), Malta (15.65 percent) and Romania (20.20 percent). The Exemption Gap in Spain is relatively high due to the application of other than VAT indirect taxes in the Canary Islands, Ceuta, and Melilla (see Section c in Annex A). The largest part of Exemption gap is composed of exemptions on services that cannot be taxed in principle, such as imputed rents, the provision of public goods by the government, or financial services. The remaining level of "Actionable" Exemption Gap is about 8 percent, on average.

The Actionable Policy Gap, a combination of the Rate Gap and the Actionable Exemption Gap, is, on average, 16 percent. This figure shows the combined reduction of Ideal Revenue due to reduced rates and the exemptions that can possibly be removed.

Table 4.1. Policy Gap, Rate Gap, Exemption Gap, and Actionable Gaps

	A Policy Gap (%)	B Rate Gap (%)	C Exemption Gap (%)	D o/w Imputed Rents (%)	E o/w Public Services (%)	F o/w Financial Services (%)	G Actionable Exemption Gap (C - D - E - F) (%)	H Actionable Policy Gap (G + B) (%)
BE	52.53	11.97	40.56	6.93	25.72	3.77	4.14	16.11
BG	27.95	2.27	25.68	9.78	8.20	1.15	6.55	8.83
CZ	38.77	5.50	33.27	8.27	15.40	2.29	7.30	12.81
DK	41.63	0.75	40.89	7.33	28.60	5.02	-0.06	0.69
DE	44.33	7.07	37.26	6.62	21.02	2.91	6.71	13.78
EE	36.07	2.56	33.51	7.06	14.84	1.98	9.63	12.19
IE	51.62	9.05	42.57	10.15	23.37	-0.33	9.37	18.42
EL	53.28	11.25	42.03	11.00	15.87	2.95	12.21	23.45
ES	59.53	14.59	44.93	10.91	18.85	2.77	12.40	27.00
FR	52.63	11.66	40.97	9.25	22.51	3.17	6.05	17.70
HR	36.05	8.80	27.24	8.28	14.47	1.63	2.86	11.66
IT	53.90	15.47	38.43	10.80	19.21	1.33	7.09	22.57
CY	45.04	29.83	15.20	9.22	17.98	-4.61	-7.39	22.44
LV	38.52	3.15	35.37	9.93	14.33	0.86	10.25	13.40
LT	28.27	4.01	24.26	5.26	12.38	-3.51	10.13	14.14
LU	42.25	16.25	26.00	4.96	26.56	-15.23	9.71	25.96
HU	42.10	4.61	37.49	7.14	16.35	3.72	10.29	14.90
MT	31.31	15.66	15.65	4.73	16.34	-12.66	7.24	22.90
NL	51.93	11.08	40.86	6.44	26.05	6.01	2.36	13.44
AT	45.61	10.99	34.62	7.01	21.73	2.35	3.53	14.52
PL	48.75	15.45	33.31	3.44	14.39	3.03	12.43	27.88
PT	50.75	11.58	39.17	8.68	20.03	2.99	7.47	19.05
RO	25.99	5.79	20.20	9.49	7.60	0.09	3.01	8.81
SI	46.81	11.68	35.14	6.62	16.40	2.68	9.44	21.12
SK	36.65	1.47	35.19	7.06	13.10	2.79	12.24	13.71
FI	50.33	7.07	43.25	11.29	22.25	4.70	5.01	12.08
SE	48.11	7.81	40.31	5.76	27.33	3.83	3.38	11.19
UK	52.45	8.68	43.77	11.40	20.13	3.68	8.56	17.24
EU-28	44.04	9.50	34.54	8.03	18.61	1.05	6.86	16.36

Annex
A. Methodological Considerations

The Methodological Annex is structured as follows. Subsection a describes the impact of the introduction of the MOSS system on the VAT Gap estimates. Subsection b discusses sources of revisions to figures published in the 2016 Report. Subsection d, e and f repeat the overview of the VAT Gap and Policy Gap estimation methodology, which remained the same as published in the 2016 Report (Poniatowski et al. 2016).

a. New rule for place of supply of electronic services and its application to the VAT Gap

The new rule for taxation of electronic and digital services came into force on 1st January 2015. Since the amendment of the rules, telecommunications, broadcasting and electronically supplied services (including e-gambling) were taxed in the country where the customer (either business or consumer) resided. In order to ease the compliance burden, each MS had installed an Internet portal – the MOSS, the only place where the company would need to register and pay its VAT liability.

Currently, Member States take the responsibility to remit VAT to each other Member State, according to the customer's residence. In the transition year of 2015, Member States were allowed to keep 30 percent of the e-services VAT revenue for themselves.

From the VAT Gap perspective, the new rule had an impact on overall household consumption liability, and on the special cases of Luxembourg and Malta.

1. The VAT liability estimates derived from the final consumption from USE tables actually became more accurate. This can be illustrated by an example. Suppose, a household in Germany had purchased a EUR 200 worth of digital services of which half was supplied from Germany, half from Luxembourg.

   Before 2015, the actual liability was split between EUR 16 paid to Germany and 15 euro paid to Luxembourg.

   After 2015, all of the liability is paid to Germany (except for EUR 5 temporary retention fee left to Luxembourg).

In both cases, SUT would attribute the whole amount of EUR 200 to the final household consumption, implying EUR 31 of the VAT liability to Germany. Therefore, the household liability estimates derived from SUT become closer to the actual liability under the new rule.

The overall effect of this correction to the household liability is rather small: taxable digital services fall unto category "J69_J60: Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services", which on average make up for just a half of the percent of total household consumption.

2. In the case of **Luxembourg**, the effect was quite substantial as Luxembourg with its lowest statutory VAT rate in the EU was the top registration destination for digital services companies. All in all, in 2014 Luxembourg derived additional EUR 1,200 million from the VAT on e-services, making up almost one-third of the total VTTL. In order to account for this additional revenue, in this, as well as in previous VAT Gap reports, we inflated the VTTL estimates by the special adjustment, using the official "e-commerce" revenue provided by the Authorities. As a result of the implementation of the new rules as of 2015, the value of adjustment fell significantly. Luxembourg still kept a portion of the revenue according to the transitional retention rate in 2015, but it is expected to decline in 2016 and further years.
3. In the case of **Malta**, the new rule had an effect via the third channel, namely the change in the amount of non-deductible intermediate consumption of the gambling and games of chance industry. Unlike other digital services, gambling and betting is exempt in all EU Member States. Moreover, the intermediate consumption of these companies was to a large extent non-deductible. Malta stands out from other EU Member States due to the importance of e-gambling industry in the economy. Before the new rule, the IC of "R90-R92 industry", which includes gambling and betting together with creative arts, museums, entertainment and other cultural services made up more than 47 percent of all intermediate consumption liability in Malta.

Despite a large reduction in the estimated VTTL the amount of actually collected, revenue in Malta did not show a decline in 2015. This could suggest, that the e-gambling industry had previously found ways to deduct VAT even before the new rule was implemented.

b. Source of revisions of VAT Gap estimates

Every year, the estimates of the VAT Gap are updated and revised backwards. There are three different sources of such revisions:

1. Updates in the underlying national accounts data published by Eurostat: updates in VAT revenues, new supply and use tables, revised industry specific growth rates, etc.
2. Updates in the estimated GFCF liability, based on the new information from the ORS submissions on taxable shares of GFCF by five sectors: households, government, NPISH and exempt financial and non-financial enterprises.
3. Revision of the parameters of the VTTL model: weighted average rates, pro-rata coefficients and net adjustments, either due to new information from ORS or due to correcting errors in the previous computation.

The breakdown of three different components of the revisions in 2014 figures are presented in Table A.1.

Table A.1. Source of revisions of VAT Gap estimates

	2016 estimates for 2014	2017 estimates for 2014	Changes due to updates in national accounts data	Changes due to revised estimates in GFCF	Changes to revision of other parameters
BE	8.4	9.8	-0.7	-0.9	0.3
BG	19.8	23.6	-0.6	-1.8	-1.4
CZ	16.1	16.6	0.2	-0.7	0.0
DK	9.8	10.5	-1.0	-0.3	0.6
DE	10.4	10.9	-0.2	-0.7	0.4
EE	9.6	8.7	0.0	-0.4	1.2
IE	9.4	8.8	0.6	0.1	0.0
EL	28.0	25.3	2.3	-1.5	1.9
ES	8.9	8.3	1.1	-1.3	0.7
FR	14.2	12.9	0.3	-0.2	1.2
HR	8.7	4.3	-0.4	-0.9	5.6
IT	27.6	28.3	0.9	-0.4	-1.2
LV	23.4	19.0	5.3	-1.3	0.4
LT	36.8	27.6	-4.1	-0.2	13.6
LU	3.8	2.4	0.2	0.5	0.7
HU	18.0	17.0	0.0	0.4	0.5
MT	35.3	39.6	-3.1	-0.3	-0.9
NL	10.4	9.2	1.2	0.3	-0.4
AT	10.2	9.6	0.2	-0.7	1.1
PL	24.1	24.9	-1.1	0.1	0.2
PT	12.5	13.2	-1.2	0.8	-0.3
RO	37.9	42.9	-2.1	-2.1	-0.9
SI	8.1	7.5	-0.6	-0.1	1.3
SK	30.0	30.5	1.1	-0.5	-1.2
FI	6.9	6.0	2.6	-1.7	0.0
SE	1.2	0.3	0.3	0.1	0.6
UK	10.1	10.6	1.7	-1.7	-0.5
EU-27	16.3	15.9	0.1	-0.6	0.9

c. Country specific issues

Tank tourism from Germany, France and Belgium to Luxembourg – the adjustment of the VTTL in Luxembourg due to fuel and services, which is exported from within the country to non-residents, but still generate VAT. These transactions, which are subject to VAT, but not accounted for in Eurostar increase the VTTL in Luxembourg. However, due to unavailability of data on the share of tourism by their residence, amendments have not been applied to Belgian, French and German figures.

Exemption Gap in Spain – both the Exemption Gap and the Actionable Exemption Gap in Spain include the loss of ideal VAT due to non-application of VAT in the Canary Islands, Ceuta, and Melilla. The value of both gaps would be reduced by 5.6 percentage points if this loss was excluded the estimation.

d. Decomposition of VAT Revenue

As VAT Revenue (VR) is the difference between the VTTL and the VAT Gap ($VR = VTTL - VAT\ Gap$, and the VTTL is a product of the effective rate and the base ($VTTL = effective\ rate \times base$), VAT revenue could be decomposed using the following formula:

$$VR = VTTL \times VAT\ compliance = effective\ rate \times base \times \left(1 - \frac{VAT\ Gap}{VTTL}\right)$$

Thus, the year-over-rear relative change in revenue is denoted as:

$$\frac{\Delta VR}{VR} = \frac{\Delta(effective\ rate)}{effective\ rate} \times \frac{\Delta base}{base} \times \Delta\left(1 - \frac{VAT\ Gap}{VTTL}\right) \Big/ \left(1 - \frac{VAT\ Gap}{VTTL}\right)$$

where $\frac{\Delta(effective\ rate)}{effective\ rate}$ denotes change in effective rate, $\frac{\Delta base}{base}$ denotes change in base, and $\Delta\left(1 - \frac{VAT\ Gap}{VTTL}\right) \Big/ \left(1 - \frac{VAT\ Gap}{VTTL}\right)$ denotes change in VAT compliance.

e. Data Sources and Estimation Method

The "top-down" method that is utilised for VAT Gap estimation relies on national accounts figures. These figures are used to estimate the VAT liability generated by different sub-aggregates of the total economy. The VTTL is estimated as the sum of the liability from six main components: household, government, and NPISH final consumption; intermediate consumption; GFCF; and other, largely country-specific, adjustments.

In the "top-down" approach, VTTL is estimated using the following formula:

$$VTTL = \sum_{i=1}^{N}(rate_i \times Value_i) + \sum_{i=1}^{N}(rate_i \times propex_i \times IC\ Value_i) + \sum_{i=1}^{N}(rate_i \times propex_i \times GFCF\ Value_i) + net\ adjustments$$

Where:

Rate is the weighted average tax rate i.e. the effective rate,

Value is the final consumption value,

IC Value is the value of intermediate consumption,

Propex is the percentage of output in a given sector that is exempt from VAT,

GFCF Value is the value of gross fixed capital formation, and

index *i* denotes sectors of the economy.

To summarise, VTTL is a product of the VAT rates and the propexes multiplied by the theoretical values of consumption and investment (plus country specific net adjustments).

For the purpose of VAT Gap estimation, roughly 10,000 parameters are estimated for each year, including the weighted average rates for each 2-digit CPA (i.e. $rate_i$ in the VTTL formula presented above) group of products and services and the percentage of output in a given sector that is exempt from VAT for each type of consumption (i.e. $propex_i$ in the VTTL formula presented above). For instance, for *Education services* (CPA no. 85) in Croatia, like for

any other country and group of products and services, we estimated weighted average rates in household, government and NPISH final consumption, as well as the percentage of output that is exempt from VAT. The main source of information is national accounts data and Own Resource Submissions (ORS), i.e. VAT statements provided by the Members States to the European Commission. In a number of specific cases where the ORS information was insufficient, additional data provided by the Member States was used. As these data are not official Eurostat publications, we decline responsibility for inaccuracies related to their quality.

A complete description of data and sources is shown in Table A.2.

Table A.2. Data Sources

	DESCRIPTION	PURPOSE	SOURCE	COMMENT
1	Household expenditure by CPA/COICOP category.	Estimation of effective rates for household final consumption for each 2-digit CPA category.	ORS / HBS[11]	...
2	The intermediate consumption of industries for which VAT on inputs cannot be deducted, pro-rata coefficients, alternatively share of exempt output.	Estimation of propexes.	ORS / assumptions common for all EU Member States	...
3	Investment (gross fixed capital formation) of exempt sectors.	Estimation of VAT liability from investment.	ORS / Eurostat	Values forecasted two years ahead of available time series.
4	Government expenditure by CPA/COICOP category.	Estimation of effective rates for government final consumption for each 2-digit CPA category of products and services.	ORS	...
5	NPISH expenditure by CPA/COICOP category.	Estimation of effective rates for NPISH final consumption for each 2-digit CPA category of products and services.	ORS	...
6	VTTL adjustment due to small business exemption, business expenditure on cars and fuel, and other country-specific adjustments.	Estimation of net adjustments.	ORS	In general, adjustments forecasted two years ahead of available time series.
7	Final household consumption, government final consumption, NPISH final consumption, and intermediate consumption.	Estimation of VTTL.	Eurostat	As national accounts figures do not always correspond to the tax base, two corrections to the base are applied: (1) adjustments for the self-supply of food and agricultural products and (2) adjustments for the intermediate consumption of construction work due to the treatment of construction activities abroad. If use tables are not available for a particular year or available use tables include confidential values, use tables are imputed using the RAS method.[12]
8	VAT revenue.	VAT revenue.	Eurostat	...

11 *Household Budget Survey, Eurostat.*

12 RAS method (use the definition from above)

f. Derivation of the Policy Gap

In this section of Annex, we define the concepts used in Chapter IV and discuss some of the methodological considerations.

We begin with the **Notional Ideal Revenue** that, by definition, should indicate an upper limit of VAT revenue (i.e. the revenue levied at a uniform rate in the environment of perfect tax compliance). As shown in Figure A1, ideal revenue is larger than VTTL and subsequently larger than VAT collection. However, due to the existence of exemptions, it does not capture the entire VTTL and tax collection. If no exemptions were applied, neither intermediate consumption nor the GFCF of business sector would be the base for computing VTTL.

The problem arises when deciding whether investment by the non-business sector should be a part of the VAT base. According to the OECD (2014), notional ideal revenue is defined as the standard rate of VAT times the aggregate net final consumption. Multiplying the standard rate and final consumption would yield, however, lower liability than in the case where a country applied no exemptions, no reduced rates, and was able to enforce all tax payments. In real life, VTTL is comprised partially from VAT liability from investment made by households, government, and NPISH. In the case of the non-inclusion of this investment to the base, VTTL would be partially extended beyond the ideal revenue despite "no exemptions" present in the system (see Figure A1 (c)).

Policy makers can see the upper limit of VAT revenue by considering all final use categories of households, non-profit, and government sectors. Thus, in this report, Notional Ideal Revenue is defined as the standard rate of VAT times the aggregate net final and net GFCF of the household, non-profit, and government sectors, as recorded in the national accounts (interdependence among the various concepts presented is shown in Figure A1).[13]

The **Policy Gap** is defined as one minus the ratio of the "legal" tax liability (i.e. the chunk of the Notional Ideal Revenue that, in the counterfactual case of perfect tax compliance, is not collected due to the presence of exemptions and reduced rates). The Policy Gap is denoted by the following formula:

Policy Gap = (Notional Ideal Revenue – VTTL)/Notional Ideal Revenue

The **Policy Gap** could be further decomposed to account for the loss of revenue. Such components are the **Rate Gap** and the **Exemption Gap**, which capture the loss in VAT liability due to the application of reduced rates and the loss in liability due to the implementation of exemptions.

13 National accounts for most countries report final consumption on a gross (i.e. VAT-inclusive) basis. Net consumption is estimated on the basis of the gross consumption recorded in the use tables, from which VAT revenues are subtracted.

The Rate Gap is defined as the difference between the VTTL and what would be obtained in a counterfactual situation, in which the standard rate, instead of the reduced, parking, and zero rates, is applied to final consumption. Thus, the Rate Gap captures the loss in revenue that a particular country incurs by adopting multiple VAT rates instead of a single standard rate (Barbone et al., 2015).

The Exemption Gap is defined as the difference between the VTTL and what would be obtained in a counterfactual situation, in which the standard rate is applied to exempt products and services, and no restriction of the right to deduct applies.[14] Thus, the Exemption Gap captures the amount of revenue that might be lost because of exempted goods and services. Note that the Exemption Gap is composed of the loss in the VAT on the value added of exempt sectors, minus the VAT on their inputs, minus the VAT on GFCF inputs for these sectors. Thus, in principle, the Exemption Gap might be positive or negative (if the particular sector had negative value added, or if it had large GFCF expenditures relative to final consumption) (Barbone et al., 2015).

In algebraic terms, we have the following:

Definitions:

$T_i^{*,E} = \frac{VTTL_i^{*,E}}{C_i}$ – effective rate for group i of products in the case where the standard rate instead of the zero rate, parking rate, or reduced rate is applied (for final consumption and the GFCF of non-business activities).

$VTTL_i^{*,E}$ – liability from final consumption GFCF of non-business activities of group i of products, in the case of the standard rate instead of the zero rate, parking rate, or reduced rate is applied. Actual liability from intermediate consumption and GFCF of business activities is assumed.

$T_i^{*,R} = \frac{VTTL_i^{*,R}}{C_i}$ – effective rate for group i of products in the event where exempt products within the group are taxed at the standard rate.

$VTTL_i^{*,R}$ – liability from final consumption of group i when exempt products within the group are taxed at the standard rate. Actual liability from final consumption GFCF of non-business activities is assumed.

14 The additive decomposition of the Policy Gap into the Exemption and Rate Gap presented in this report differs from that in Keen (2013). Keen (2013) defines the Rate Gap as the loss from applying reduced and zero rates to the final consumption liability, measured as a percentage of the Notional Ideal Revenue. The Exemption Gap measures unrecovered VAT accumulated in the production process as a percentage, on the contrary, of final consumption liability. Due to these definitions, the Policy Gap can be split multiplicatively into gaps attributable to reduced rates and exemptions. Since the numerator of the "[1 - Rate Gap]" and denominator of the "[1 - Exemption Gap]" are equal, multiplication of these two components yields – VAT revenue as a percentage Notional Ideal Revenue, which equals "[1 - Policy Gap]" (Barbone et al., 2015).

τ_s – statutory rate.

$i \in (1;65)$ – sectors of the economy.

Policy Gap:

$$1 - P = \left(\frac{\sum_{i=1}^{N} T_i C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)\left(\frac{\sum_{i=1}^{N} T_i^* C_i}{\sum_{i=1}^{N} T_i C_i}\right) = \left(\frac{\sum_{i=1}^{N} T_i^* C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)$$

Exemption Gap:

$$1 - P_E = \left(\frac{\sum_{i=1}^{N} T_i C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)\left(\frac{\sum_{i=1}^{N} T_i^{*,E} C_i}{\sum_{i=1}^{N} T_i C_i}\right) = \left(\frac{\sum_{i=1}^{N} T_i^{*,E} C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)$$

Rate Gap:

$$1 - P_R = \left(\frac{\sum_{i=1}^{N} T_i C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)\left(\frac{\sum_{i=1}^{N} T_i^{*,R} C_i}{\sum_{i=1}^{N} T_i C_i}\right) = \left(\frac{\sum_{i=1}^{N} T_i^{*,R} C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)$$

By definition we have:

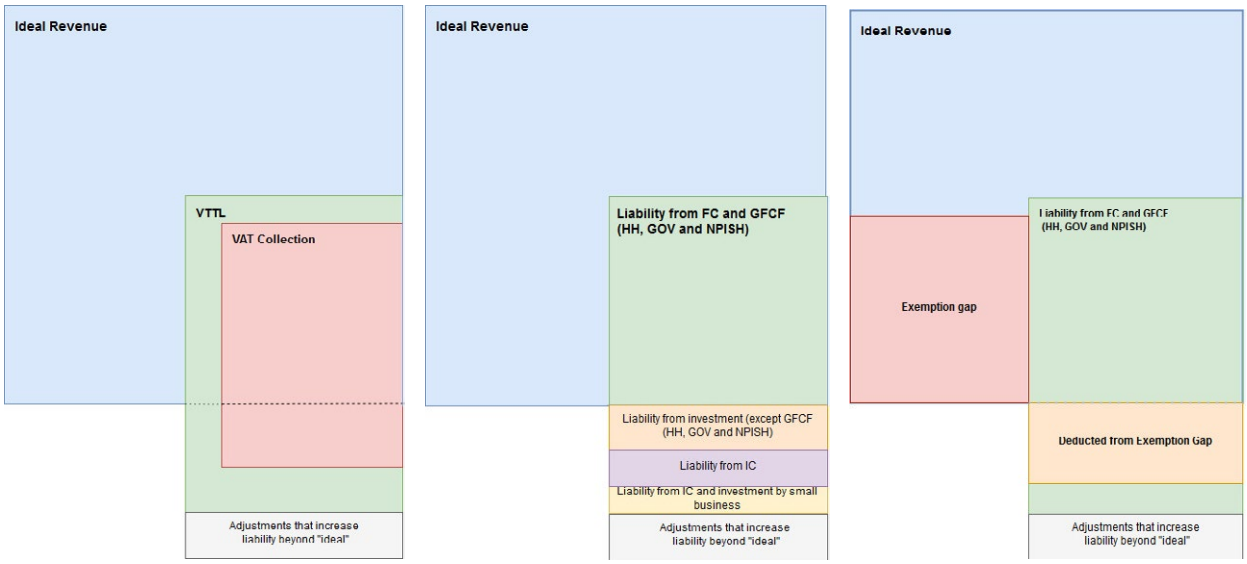
$$\tau_s \sum_{i=1}^{N} C_i = \sum_{i=1}^{N} T_i^* C_i + \left(\tau_s \sum_{i=1}^{N} C_i - \sum_{i=1}^{N} T_i^* C_i\right)$$
$$= \sum_{i=1}^{N} T_i^* C_i + \left(\tau_s \sum_{i=1}^{N} C_i - \sum_{i=1}^{N} T_i^{*,R} C_i\right) + \left(\tau_s \sum_{i=1}^{N} C_i - \sum_{i=1}^{N} T_i^{*,E} C_i\right)$$

Thus:

$$P = 1 - \left(\frac{\sum_{i=1}^{N} T_i^* C_i}{\tau_s \sum_{i=1}^{N} C_i}\right) = \left(\frac{\tau_s \sum_{i=1}^{N} C_i - \sum_{i=1}^{N} T_i^* C_i}{\tau_s \sum_{i=1}^{N} C_i}\right) = \left(\frac{2\tau_s \sum_{i=1}^{N} C_i - \sum_{i=1}^{N} T_i^{*,E} C_i - \sum_{i=1}^{N} T_i^{*,R} C_i}{\tau_s \sum_{i=1}^{N} C_i}\right)$$
$$= P_R + P_E$$

Using the above convention, one can decompose the Rate Gap and the Exemption Gap into the components indicating loss of the Notional Ideal Revenue due to the implementation of reduced rates and exemptions on specific the goods and services. Such additive decomposition is carried out for the computation of, as defined by Barbone et al. (2015), the Actionable Exempt Gap, which excludes services and notional values that are unlikely to be taxed even in an ideal world.

Figure A1. Components of Ideal Revenue, VTTL, and VAT Collection



Source: own.

Annex B. Statistical Appendix

Table B1. VTTL (EUR million)

	2011	2012	2013	2014	2015
Belgium	29604	31229	31057	30496	30869
Bulgaria	4506	4776	4660	4986	5111
Czech Republic	13567	14257	14432	13916	14826
Denmark	26501	27250	27474	27868	28562
Germany	210499	218025	221654	227979	233982
Estonia	1551	1719	1808	1874	1969
Ireland	11550	12099	11725	12628	13275
Greece	22677	19192	18751	16966	17964
Spain	64526	62761	68926	69400	71092
France	152667	162380	162708	170435	171735
Croatia	.	.	.	5611	5921
Italy	139468	134560	133986	135376	136127
Cyprus	.	.	.	.	1639
Latvia	2032	2068	2213	2207	2287
Lithuania	3465	3638	3686	3816	3925
Luxembourg	3019	3301	3544	3823	3634
Hungary	10833	11585	11477	11757	12369
Malta	882	938	992	1063	883
Netherlands	46173	45971	47166	47050	48751
Austria	26189	26625	27624	28084	28589
Poland	37512	38013	37725	39032	39840
Portugal	16461	16581	16288	16914	17357
Romania	18193	17913	19133	20116	20599
Slovenia	3179	3165	3209	3411	3406
Slovakia	6570	6960	7048	7227	7677
Finland	18261	18919	19959	20159	20392
Sweden	37659	40094	39892	38956	39933
United Kingdom	143514	159037	158717	176193	204156
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	1051055	1083057	1095853	1137342	1186869

Source: own calculations.

Table B2. Household VAT Liability (EUR million)

	2011	2012	2013	2014	2015
Belgium	16666	17219	17576	17480	17870
Bulgaria	3363	3595	3399	3559	3655
Czech Republic	8475	9064	9303	8917	9292
Denmark	15216	15719	15992	16219	16635
Germany	134224	137795	139195	142349	146246
Estonia	1098	1202	1273	1322	1378
Ireland	7127	7405	7281	7520	7973
Greece	16125	14017	13498	12381	13199
Spain	44891	46291	50150	50979	52568
France	94180	96942	96958	101684	103383
Croatia	.	.	.	4093	4205
Italy	99560	97624	95936	97871	99158
Cyprus	.	.	.	.	1034
Latvia	1555	1634	1679	1715	1770
Lithuania	2788	2941	3010	3132	3232
Luxembourg	1079	1131	1143	1181	1452
Hungary	7735	8234	8217	8178	8428
Malta	386	412	429	448	474
Netherlands	24285	24745	25882	25363	25952
Austria	17767	18307	18995	19305	19470
Poland	24769	25966	26146	26935	27400
Portugal	11432	12371	12239	12818	13112
Romania	11029	11014	11227	12159	12384
Slovenia	2271	2285	2284	2412	2411
Slovakia	4873	5029	5101	5239	5357
Finland	10154	10513	11041	11074	11323
Sweden	20053	21307	21117	20681	20881
United Kingdom	94913	105038	104451	116687	136957
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	676013	697797	703522	731701	767200

Source: own calculations.

Table B3. Intermediate Consumption and Government VAT Liability (EUR million)

	2011	2012	2013	2014	2015
Belgium	7435	7599	7697	7364	7538
Bulgaria	622	644	687	787	748
Czech Republic	3480	3402	3439	3254	3463
Denmark	7354	7673	7575	7671	7837
Germany	42634	43608	44992	46738	47634
Estonia	224	235	249	257	267
Ireland	2967	3461	3253	3666	3669
Greece	2877	2704	2304	2030	2243
Spain	10922	10526	11026	10753	10778
France	25902	27140	27655	28681	29076
Croatia	.	.	.	936	1113
Italy	20279	19815	20378	20548	20463
Cyprus	.	.	.	.	443
Latvia	346	343	360	370	388
Lithuania	415	445	407	443	445
Luxembourg	593	606	642	722	938
Hungary	1924	1948	1860	1940	2035
Malta	458	479	511	559	336
Netherlands	12669	12916	13565	13677	13902
Austria	4404	4544	4646	4907	5077
Poland	7035	7118	6933	7344	7700
Portugal	3037	2870	2826	2868	2937
Romania	2787	2860	2755	3189	3096
Slovenia	472	471	490	508	518
Slovakia	1071	1166	1211	1258	1343
Finland	4262	4358	4749	4899	4921
Sweden	10764	11489	11592	11004	11493
United Kingdom	36720	38583	37160	40181	46754
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	211652	217004	218960	226554	237154

Source: own calculations.

Table B4. GFCF VAT Liability (EUR million)

	2011	2012	2013	2014	2015
Belgium	4007	4895	4725	4992	5088
Bulgaria	463	478	521	595	662
Czech Republic	1574	1783	1690	1768	2083
Denmark	3292	3178	3179	3276	3369
Germany	32277	35350	36084	37575	38792
Estonia	220	272	278	285	315
Ireland	1304	1079	1031	1289	1468
Greece	3307	2220	2682	2312	2256
Spain	8463	5632	7353	7241	7279
France	28103	33496	33133	34634	33988
Croatia	.	.	.	562	530
Italy	15035	12770	13564	13212	13370
Cyprus	.	.	.	.	141
Latvia	196	194	278	238	246
Lithuania	372	378	398	415	454
Luxembourg	305	317	306	319	382
Hungary	1074	1169	1222	1475	1753
Malta	37	45	50	55	71
Netherlands	8750	7824	7205	7502	8389
Austria	2477	2296	2545	2562	2621
Poland	4738	3924	3647	4048	4188
Portugal	1665	981	887	894	955
Romania	3718	3387	4740	4110	4480
Slovenia	322	303	334	403	399
Slovakia	607	745	725	751	994
Finland	3295	3570	3622	3583	3537
Sweden	6055	6407	6562	6619	6889
United Kingdom	9884	12662	13466	16519	18757
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	141539	145354	150226	157235	163454

Source: own calculations.

Table B5. VAT Revenues (EUR million)

	2011	2012	2013	2014	2015
Belgium	25979	26844	27250	27518	27547
Bulgaria	3362	3769	3898	3810	4059
Czech Republic	11246	11377	11694	11602	12382
Denmark	23682	24399	24320	24950	25470
Germany	189910	194034	197005	203081	211616
Estonia	1363	1508	1558	1711	1873
Ireland	9755	10219	10372	11521	11955
Greece	15021	13713	12593	12676	12885
Spain	55904	56652	60951	63643	68589
France	140552	142527	144490	148454	151622
Croatia	.	.	.	5368	5689
Italy	98650	96170	93921	97071	101034
Cyprus	.	.	.	.	1517
Latvia	1374	1570	1690	1787	1876
Lithuania	2444	2521	2611	2764	2888
Luxembourg	2879	3164	3429	3732	3432
Hungary	8516	9084	9073	9754	10669
Malta	520	540	582	642	684
Netherlands	41610	41699	42424	42708	44879
Austria	23394	24507	24895	25386	26232
Poland	29764	27783	27780	29317	30075
Portugal	14265	13995	13710	14682	15368
Romania	11412	11003	11710	11496	12939
Slovenia	2995	2888	3046	3155	3219
Slovakia	4711	4328	4696	5021	5420
Finland	17315	17987	18888	18948	18974
Sweden	36631	37834	39048	38846	40501
United Kingdom	130818	143405	142223	157478	181945
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	906082	925531	935869	979135	1037354

Source: Eurostat.

Table B6. VAT Gap (EUR million)

	2011	2012	2013	2014	2015
Belgium	3625	4385	3807	2978	3323
Bulgaria	1144	1007	762	1176	1052
Czech Republic	2321	2880	2737	2313	2444
Denmark	2818	2851	3153	2919	3092
Germany	20589	23991	24649	24898	22366
Estonia	188	211	250	163	96
Ireland	1795	1880	1353	1106	1319
Greece	7656	5479	6158	4290	5079
Spain	8622	6109	7975	5757	2503
France	12115	19853	18218	21981	20113
Croatia	.	.	.	243	232
Italy	40818	38390	40065	38305	35093
Cyprus	.	.	.	.	122
Latvia	658	498	523	420	411
Lithuania	1021	1117	1075	1052	1037
Luxembourg	140	137	115	90	202
Hungary	2317	2501	2403	2003	1700
Malta	362	398	410	421	199
Netherlands	4563	4272	4742	4342	3872
Austria	2795	2118	2730	2699	2357
Poland	7747	10229	9945	9715	9765
Portugal	2196	2586	2578	2232	1989
Romania	6782	6910	7423	8620	7659
Slovenia	184	277	164	256	188
Slovakia	1859	2632	2352	2206	2256
Finland	946	932	1071	1211	1418
Sweden	1028	2260	844	110	-568
United Kingdom	12696	15632	16494	18715	22210
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	146983	159538	161997	160220	151530

Source: own calculations.

Table B7. VAT Gap (percent of VTTL)

	2011	2012	2013	2014	2015
Belgium	12.25	14.04	12.26	9.77	10.76
Bulgaria	25.39	21.09	16.35	23.58	20.58
Czech Republic	17.11	20.20	18.97	16.62	16.48
Denmark	10.63	10.46	11.48	10.47	10.83
Germany	9.78	11.00	11.12	10.92	9.56
Estonia	12.15	12.28	13.84	8.70	4.88
Ireland	15.54	15.54	11.54	8.76	9.94
Greece	33.76	28.55	32.84	25.29	28.27
Spain	13.36	9.73	11.57	8.30	3.52
France	7.94	12.23	11.20	12.90	11.71
Croatia	.	.	.	4.33	3.92
Italy	29.27	28.53	29.90	28.30	25.78
Cyprus	.	.	.	.	7.47
Latvia	32.38	24.07	23.63	19.01	17.97
Lithuania	29.47	30.71	29.16	27.57	26.41
Luxembourg	4.63	4.16	3.24	2.36	5.56
Hungary	21.39	21.59	20.94	17.04	13.74
Malta	41.02	42.40	41.34	39.59	22.57
Netherlands	9.88	9.29	10.05	9.23	7.94
Austria	10.67	7.96	9.88	9.61	8.24
Poland	20.65	26.91	26.36	24.89	24.51
Portugal	13.34	15.60	15.83	13.20	11.46
Romania	37.28	38.58	38.80	42.85	37.18
Slovenia	5.78	8.77	5.10	7.50	5.52
Slovakia	28.29	37.82	33.37	30.52	29.39
Finland	5.18	4.93	5.37	6.01	6.95
Sweden	2.73	5.64	2.12	0.28	-1.42
United Kingdom	8.85	9.83	10.39	10.62	10.88
EU-26 (2011-2013) EU-27 (2014) EU-28 (2015)	13.98	14.73	14.78	14.09	12.77

Source: own calculations.

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