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VAT GAP IN THE EU

2023 REPORT

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Introduction

Value Added Tax (VAT) in the European Union (EU) is a broad-based tax levied on goods and services used or consumed in the territory of the EU. Its role shall not be undervalued. It serves as one of the core revenue sources for the EU Member States and VAT rules play a very important role in the EU Single Market. In 2021, the contribution of VAT accounted for approximately 27 percent of the total yearly tax receipts for general government in the EU.[1] It is also used as a reference to calculate the EU's own resources. A rate of 0.3 percent applies to each EU member's harmonised VAT base. Thus, VAT-based resources in 2021 amounted to 17.97 EUR billion and 11 percent of the EU's total own resources.

One of the key challenges of meeting the fiscal objective of VAT and the main issue addressed by the estimates presented in this report is taxpayer non-compliance with VAT payment obligations. The forms of such non-compliance, which are the underlying drivers of the *VAT compliance gap,* range from the legal exploitation of loopholes in tax systems to evasion or organised large-scale tax fraud. Non-compliance could also be non-intentional and result, among others, from administrative errors, omissions, and non-fraudulent bankruptcies. Tax fraud, evasion, and avoidance, which are the core interest of this study, cost EU Member States' budgets billions of euros every year. They also threaten the principle of fair taxation and impede fairness of competition between businesses.

Other important sources of the forgone VAT revenue are the policy decisions narrowing the tax base or reducing VAT liability for certain parts of the tax base. These choices are made to meet distributional objectives or to provide certain incentives for taxpayers at the cost of VAT revenue. They could also be taken due to difficulties imposing payments on certain taxpayers or on certain types of goods and services. The policy decisions reducing tax revenue are often referred to as *tax expenditures*. The fiscal cost of the VAT expenditures is highly inter-related with the broad measure of the departure of the VAT base and effective rates from the notional VAT system, the so-called *VAT policy gap*, which is also addressed by this report.

The relevance of the problem of lost VAT revenue due to non-compliance and the design of the VAT rules would be largely unknown without tax gap estimates. These estimates not only serve as a useful tool to understand the overall size of the revenue losses in VAT but also help to understand their nature, which is crucial for making well-grounded policy decisions and improvements to tax administration. The estimates of the tax gap components and their evolution in time provide insights on the strategies and measures that improve the efficiency of VAT collection.

This report aims to support tax administrations in their VAT gap monitoring efforts. It scrutinises VAT compliance gaps and VAT policy gaps in all EU Member States using a standardised methodology and data sources, which allows for comparisons across time and against other Member States. The estimates provided in this report serve for some administrations as a reference point for own analyses. For other administrations that do not prepare own estimates of the VAT compliance gap and VAT expenditures, the estimates presented in this report are the primary source information on VAT gaps.

[1] *Eurostat GOV_10A_TAXAG dataset.*

The headline figures of this report are the yearly VAT compliance gap estimates for the EU and its Member States covering the five-year period of 2017-2021. The report also includes estimates using a simplified methodology – *fast estimates* – for the year immediately preceding the publication date. These estimates are presented for the 20 Member States for which the available data allowed to proxy the change in effective rates. In addition, the report presents the estimates from 10 preceding vintages of the study rescaled to account for the corrections and improvements in the full calculations covering the 2017-2021 period. VAT policy gaps are also presented for the same five-year period and are decomposed to disentangle the impact that specific rate reductions and exemptions made to the theoretical VAT revenue losses. We also present estimates of the overall collection efficiency (the *C-efficiency* ratio) and investigate changes in yearly VAT revenue due to basic components, which are the tax base, tax rates, and taxpayer compliance.

On top of presenting the VAT gaps, this report also investigates the sources of these gaps. The report includes four case studies devoted to important problem areas and patterns observed in selected Member States. The analysis covers four Central and Eastern European Member States that, by implementing similar measures, were able to narrow their compliance gaps significantly in relatively short time frames. The report also examines specifically Romania, where the estimated VAT compliance gap has remained high and largely unchanged over several years. In addition to the analysis of longer time periods, two case studies look at the impact of the COVID-19 pandemic. More specifically, the case studies analyse changes in the VAT compliance gap in Germany, which significantly decreased the VAT burden after the outbreak of the pandemic, and the six Members States with the largest contribution of tourism and hospitality to GDP, the sectors most heavily affected by the pandemic.

This is the 11th consecutive publication of the European Commission presenting VAT gap estimates. It follows the seminal study of EC/Reckon (2010) and the subsequent publication of EC/CASE (2013) that established the methodological approach to the tax gap calculations presented in this report. It also includes the methodological improvements and novelties introduced by the study teams working on previous VAT gap reports. This report also benefits from consultations with Member State authorities and the validation of the estimates with the results available from national administrations.

This is the first study presenting the VAT gap estimates for the EU that did not take advantage of the Own Resource Submissions as the primary source of information for estimating the parameters of the VTTL model, as in the earlier studies. Due to the discontinuation of the submissions containing granular information on the VAT base structure in the EU, the information necessary to obtain compliance and policy gap estimates was gathered directly from Member State administrations. During the course of this study, the majority of the information was made available to the study team, which allowed to ensure the accuracy of estimates for most of the Member States.

The report consists of nine chapters. The first chapter discusses the methodological approach. The second chapter describes the economic and policy contexts, which are important drivers of the gaps presented in the followings chapters. VAT compliance gaps and the analysis of the sources of their evolution are discussed in the third and fourth chapters, respectively. In the fifth chapter, we analyse the VAT policy gap, the role of its components, and the C-efficiency. The sixth chapter brings together the findings presented in the preceding chapters and provides a decomposition of the VAT revenue components. The seventh chapter presents the detailed results of the VAT gap estimates

and outlines trends for individual countries coupled with analytical insights. The eighth chapter discusses data availability and reliability and reassesses the methodological approach. The ninth chapter assesses various designs of the web front-end for visualisation and dissemination. Annex A complements the second chapter by presenting the detailed methodological considerations underlying all components of the analysis. Annex B contains external reviews of the inception and draft final reports by two external reviewers. Annex C provides the statistical data and a set of comparative tables.

I. Methodology

I.a. Preliminaries

The calculation of the VAT compliance and policy gaps uses a methodology well-established by earlier VAT gap studies – the *top-down consumption-side* approach. The approach has relatively low data requirements, making it one of the most popular methods, which can be applied in many countries with the main condition of available, up-to-date, and accurate national accounts figures. The advantage of the method is simplicity, the possibility to standardise the approach across Member States, and accuracy in deriving the overall size of the gap. In many countries, the consumption-side approach is treated as the most reliable resource on the overall scale of the VAT gap, while its components are derived using other methods. The method also poses some challenges that are listed and discussed in Annex A.

The top-down consumption-side approach is used to derive the VAT Total Tax Liability (VTTL), i.e., the theoretical VAT revenue in a counterfactual situation of full tax compliance, for the core period covered by the study. The estimates for the preceding period (2000-2016) reported in Annex C and the estimates for 2022 use different methodologies. The latter element is estimated based on the VAT compliance gap estimates for the core period (2017-2021) rather than on the direct estimation of the VTTL. The methodological approach to calculating these numbers is discussed in Annex A.

The VAT compliance gap is a measure of overall non-compliance in VAT. It represents more than just fraud and evasion and their associated policy measures. The VAT compliance gap also covers VAT lost due to, for example, insolvencies, bankruptcies, administrative errors, and legal tax optimisation. It is the difference between the tax revenue that would be collected in the case of full compliance (assuming an unchanged tax base), referred to as the VTTL, and the actual revenue. Most often, the compliance gap is expressed in absolute terms (1) or in relation to the benchmark, i.e., in relation to the VTTL (2):

$$VAT\ compliance\ gap\ = VTTL - VAT\ revenue \quad (1)$$

$$VAT\ compliance\ gap\ (\%) = \frac{VTTL - VAT\ revenue}{VTTL} \quad (2)$$

To avoid potential inaccuracies, the VTTL and VAT revenues must be aligned in terms of timing. For this reason, the revenue included in the calculations follows accrual rather than cash accounting. Thus, if ESA 2010 (European System of National and Regional Accounts from 2010) revenue figures are reported without accounting for certain elements such as late payments, they are amended accordingly using data obtained from Member State authorities.

The VAT policy gap is an indicator of the additional VAT revenue that could theoretically (i.e., under the assumption of perfect tax compliance) be generated if a uniform VAT rate were applied to the final domestic use of all goods and services by households, government and non-profit institutions serving households (NPISH). To assess the relative impact of reduced rates and exemptions on revenue losses, the liability according to the tax law needs to be compared with the potential revenue that could be collected in a VAT system with a uniform rate and the broadest possible base. This benchmark, called *notional ideal revenue*, assumes that the VAT is imposed on the entire final consumption and household, government and NPISH investment given the current standard VAT rate. The difference between the notional ideal revenue and the VTTL is the VAT policy gap; this captures the effects of applying multiple rates and exemptions on the theoretical revenue that could be levied in a given VAT system. The VAT policy gap can also be expressed in absolute (3) or in relative terms (4):

$$VAT\ policy\ gap\ = notional\ ideal\ revenue - VTTL \quad (3)$$

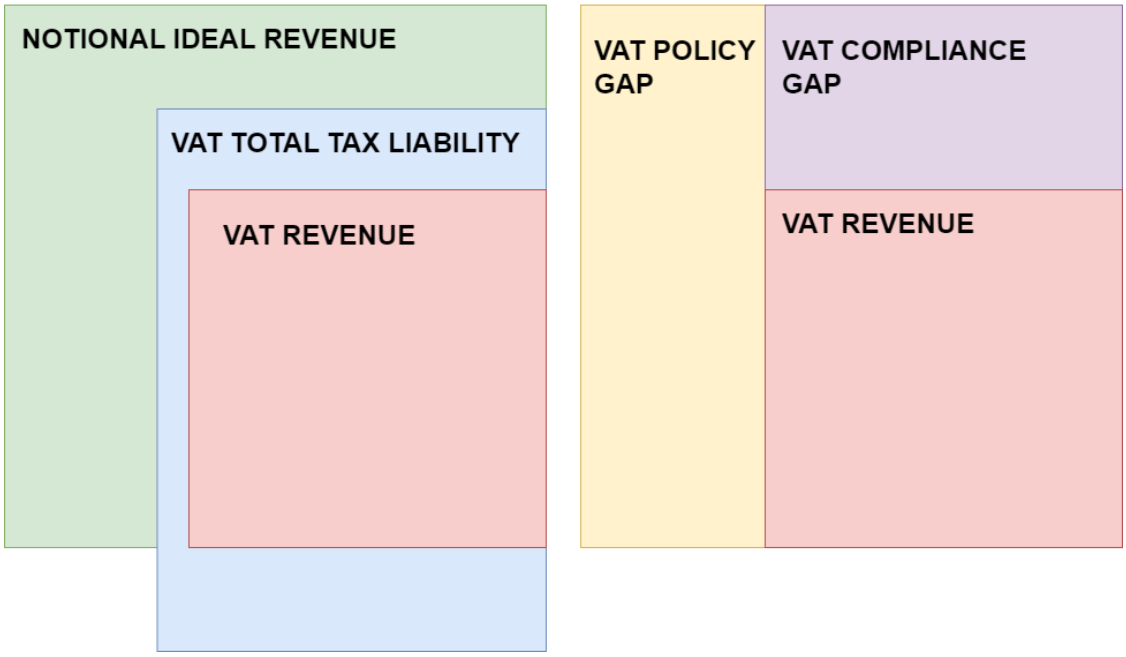
$$VAT\ policy\ gap\ (\%) = \frac{notional\ ideal\ revenue - VTTL}{notional\ ideal\ revenue} \quad (4)$$

The policy gap includes a broad range of exemptions, exclusions from the tax base, and preferential treatment. Many of these can be named as tax expenditures. Others are implemented for goods and services that are difficult to be taxed because, for example, the goods and services are not offered at market prices (public services), or it is difficult to define the tax base (financial and insurance services), or it is too cumbersome to define the place of supply (international transport). In contrast to the VAT compliance gap when estimated following the consumption-side approach, the policy gap can be decomposed to examine the impact of different types of preferential treatment or to analyse their impact on certain parts of the tax base.

Due to the idealistic assumption of perfect tax compliance and a very broad base, which captures all final consumption and gross fixed capital formation (GFCF) by households, government and NPISH, this term *notional ideal revenue*, and the practical interpretation of the policy gap in general, have drawn criticism. Since it is very difficult or impossible to collect VAT on some components of the notional ideal revenue, the VAT policy gap is often broader than the estimates of VAT expenditures. Nonetheless, the simplicity of the policy gap measure allows to compare different tax systems, which is not possible for other tax expenditure measures that often vary in their definition of the tax benchmark.

There is an apparent relationship between the VAT gaps and the respective benchmarks, the VTTL, and the notional ideal revenue. The difference between the notional ideal revenue and the VAT receipts is the sum of the policy and compliance gaps, which accounts for all revenue losses in a given VAT system (see Figure 1). As shown by Figure 1, the VTTL, although in practice always smaller, spans partially beyond the notional ideal revenue. This is the effect of the shift in the actual base caused by the exemptions without the right to deduct (see Figure 2).

Figure 1: Components of the notional ideal revenue



Source: own elaboration.

I.b. Estimation of the VTTL

The VTTL is estimated as the sum of the liability from six main components: final consumption by households (HHC), government (GOV), and non-profit institutions serving households (NPISH), intermediate consumption (IC), gross fixed capital formation (GFCF) and other, largely country-specific, adjustments like limited right to deduct VAT on fuel (net adjustments). To estimate the VTTL, around ten thousand parameters are estimated for each year. Estimated parameters include weighted average rates[2] for each 2-digit CPA group of products and services and *propexes* (aka *pro-ratas*), which stand for the share of the sector's exempt output. Under the employed approach, the VTTL is estimated using the following formula (5):

[2] *Weighted average rate is understood as the ratio of tax liability to net tax base, i.e., the value of the respective types of use in national accounts.*

$$VTTL = \sum_{i=1}^{N}(HHC\ VAT\ rate_i \times HHC\ value_i) + \sum_{i=1}^{N}(GOV\ VAT\ rate_i \times GOV\ value_i) + \sum_{i=1}^{N}(NPISH\ VAT\ rate_i \times NPISH\ value_i) + \sum_{i=1}^{N}\sum_{j=1}^{M}\left(IC\ VAT\ rate_i \times Propex_j \times IC\ value_{i,j}\right) + \sum_{i=1}^{N}\sum_{j=1}^{M}\left(GFCF\ VAT\ rate_i \times Propex_j \times GFCF\ value_{i,j}\right) + net\ adjustments$$

(5)

where:

i denotes groups of products (goods and services),

j denotes industries and sectors of economic activity,

N denotes number of groups of products and services, *M* denotes numbers of industries and number of sectors,

(HHC, GOV, NPISH, IC, GFCF) Value are the respective components of the final use – household, government, NPISH final consumption, intermediate consumption, and gross fixed capital formation (denoted in net [of VAT] terms),

(HHC, GOV, NPISH, IC, GFCF) VAT rate are the effective VAT rates for the respective sub-aggregates of the economy and groups of products and services,

Propex represents the percentage of output exempt from VAT in a given sector.

Household consumption liability

The core component of the VTTL, and the first component of Equation (5), is household final consumption liability.[3] It is a product of the effective VAT rates and household consumption values of each of the groups of products and activities. Households' consumption values, similar to other components of the use tables, are recorded in purchaser's prices, thus requiring correction for the included VAT component. Moreover, one must also adjust for non-taxable consumption, in particular self-supply and imputed rents.

Government and NPISH consumption liability

The government and NPISH consumption liabilities are estimated as a product of their respective VAT rates and the government and NPISH consumption values. Contrary to household consumption,

[3] *See e.g., EC/CASE (2013) for a comparison of the VTTL components in EU Member States.*

most government and NPISH transactions do not constitute a taxable event. One exception is transfers in kind, which constitute one of the components of individual government consumption.

Intermediate consumption liability

The liability from intermediate consumption is computed for each industry as a product of the intermediate use of each of the inputs, the average VAT rate for these groups of inputs, and the industry average proportion of non-deductible VAT in intermediate consumption. It is important to note that intermediate consumption is reported in purchaser's prices, and thus it includes non-deductible VAT, which needs to be excluded from the use tables to reflect the net tax base.

Gross fixed capital formation liability

Similar to intermediate consumption liability, non-deductible investment is estimated as a product of the tax rate, the propex, and the base, i.e., the industry's GFCF. Its main components include housing and public investment.

Net adjustments

In addition to the core components of the base, the estimation method involves corrections that are accounted for outside of the main formula of the VAT compliance gap model. More specifically, these adjustments are: (1) the limited right to deduct VAT on accommodation and restaurant services (e.g., representation expenses), (2) the correction for small businesses under the VAT threshold, (3) non-deductible expenditures on business cars and fuel expenses, (4) the special VAT regime on selected territories (such as the Greek islands, Corsica island), (5) netting out non-VAT taxes from the reported VAT revenue (e.g., revenue from Canary Islands Tax that is included in Eurostat-reported VAT revenue).

The liability on hospitality services (1) is estimated by multiplying the intermediate use of these services by the applicable rates. The small business correction (2) is estimated by multiplying the share of small companies' output in the overall output of economic operators by the gross VTTL before the adjustment. The business cars and fuel adjustments (3) are calculated by multiplying the VAT base by the applicable rate. The calculation most often uses data sourced from national administrations. If unavailable, this correction is calculated as a product of the GFCF expenditure on cars and fuel, applicable rates, and pro-rata coefficients. Adjustments for selected territories (4) are calculated by adjusting the national VTTL by the estimated share of the VTTL generated by those territories.

As a source of information to estimate the VTTL, figures from national accounts (as a source of information on the tax base) as well as data from fiscal registers and various surveys (as an evidence base for estimating the parameters of the model) are used. In contrast to the *production-side* approach which estimates the VTTL payments for all sectors, the *consumption-side* approach looks at the final liability in a product breakdown and corrects the liability estimates for the non-deductible VAT hidden at the intermediate stage.

The main sources of information on the tax base are the national accounts' supply and use tables (SUT). The data for estimating model parameters for 2021 comes from the dedicated survey for tax administrations and national statistical agencies (see Table 1). For other years, the primary source of information on the tax rules and the structure of the tax base were the Own Resource

Submissions.[4] Due to the simplification of procedures implemented by DG BUDG, comprehensive information for estimating effective VAT rates is no longer available on a yearly basis. Instead, a detailed calculation of the VAT weighted average rate will be conducted every seven years.

Table 1: Data sources for the VTTL calculation

DESCRIPTION	PURPOSE	SOURCE	COMMENT
Household expenditure by CPA/COICOP category	Estimation of effective VAT rates for household final consumption for each 2-digit CPA category	MS tax administrations / Eurostat	*Information requested in questionnaires for tax administrations. In cases where this is unavailable, Eurostat figures (NAMA_10_CO3_P3) in 3-digit breakdown will be used.*
The intermediate consumption of industries for which VAT on inputs cannot be deducted, pro-rata coefficients, alternatively share of exempt output	Estimation of propexes	MS tax administrations / Eurostat	*Information requested in questionnaires for tax administrations and national statistical agencies (previously sourced from ORS). Eurostat (SUT) will be used as a source of information on the structure of, among others, R&D output.*
Investment (gross fixed capital formation) of exempt sectors	Estimation of VAT liability from investment	MS tax administrations / Eurostat	*Information requested in questionnaires for tax administrations and statistical agencies. In the past studies, values were forecasted two years ahead of available time series.*
Government expenditure by CPA/COICOP category	Estimation of effective VAT rates for government final consumption for each 2-digit CPA category	MS tax administrations	*Information requested in questionnaires for tax administrations and statistical agencies. Only individual government consumption and social transfers in kind specifically are a part of the tax base. However, the weighted average rate is estimated using a broad definition of the base which includes entire government consumption.*
NPISH expenditure by CPA/COICOP category	Estimation of effective VAT rates for NPISH final consumption for each 2-digit CPA category	MS tax administrations	*Information requested in questionnaires for tax administrations.*
VTTL adjustment due to small business exemption, business expenditure on cars and fuel, and other country-specific adjustments	Estimation of net adjustments	MS tax administrations	*Information requested in questionnaires for tax administrations. In general, adjustments are forecast two years ahead of available time series.*

[4] *"Own Resource Submissions" are files submitted by Member States' administrations containing calculations of VAT own resources which are later used as a base for estimating Member States' contributions to the EU budget. These files contain a standardised summary statement with ca. 40 components of the VAT final base and its adjustments in accordance with the Directive 2006/112 EC. For each of the components and adjustments, detailed country-specific calculations are included.*

DESCRIPTION	PURPOSE	SOURCE	COMMENT
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 include confidential values, they are imputed using the latest national account industry level growth rates.*

Source: own elaboration.

I.c. VAT policy gap and its decomposition

The policy gap can be decomposed to further understand how different elements of the tax system contribute to the loss of VAT revenue. In this study, the VAT policy gap is decomposed into "additive" components (summing up to the total policy gap).[5] The main components of this decomposition are the rate gap and the exemption gap, which capture the forgone VAT liability due to the application of reduced rates and the implementation of exemptions or the exclusion of part of household final consumption from the tax base.

The rate gap is defined as the difference between what would have been obtained in a counterfactual situation in which the standard rate had been applied to the total final consumption and the VTTL. The exemption gap is defined as the difference between what would have been obtained in a counterfactual situation in which the standard rate had been applied to exempt products and services and no restriction of the right to deduct were applicable and the VTTL.

The notional ideal revenue can be expressed as (6):

$$notional\ ideal\ revenue = VAT\ standard\ rate \times \sum_{i=1}^{N} FC\ value_i \quad (6)$$

where:

$i \in (1; 65)$ – groups of products and services,

$FC\ value$ – final consumption (including HHC, GOV, and NPISH).

The policy gap, the exemption gap, and the rate gap can be expressed in absolute terms as the difference between the counterfactual liabilities assuming the withdrawal of reduced rates and/or exemptions and the VTTL (7, 8, 9):

$$VAT\ policy\ gap = notional\ ideal\ revenue - VTTL \quad (7)$$

$$VAT\ rate\ gap = VTTL^R - VTTL \quad (8)$$

[5] *In contrast to the decomposition proposed by Keen (2013).*

$$VAT\ exemption\ gap = VTTL^{E} - VTTL \tag{9}$$

As shown in (6), the counterfactual liability used for estimating the VAT policy gap (i.e., notional ideal revenue) assumes that final consumption and GFCF by households, government and NPISH are subject to the standard rate and that there is no non-deductible input VAT. The estimation of the rate gap (8) requires estimating the counterfactual VAT liability ($VTTL^{R}$) for the situation when no reduced rates are applied to all final consumption categories and non-private sector GFCF (see (10)). In this counterfactual case, the liability on intermediate inputs and companies' GFCF does not change compared to the actual liability (i.e., the VTTL). This has two implications. First, the rate gap does not account for the fact that the withdrawal of reduced rates could increase the non-deductible VAT of companies that do not have the right to deduct. Second, thanks to this assumption, the rate and exemption gaps are additive. As a result, there is no residual effect, which would be conceptually problematic to be attributed either to exemptions or reduced rates.

The VTTL can be calculated as follows:

$$\begin{aligned} VTTL^{R} = & \sum_{i=1}^{N} (HHC\ VAT\ rate_{i}^{R} \times HHC\ value_{i}) \\ & + \sum_{i=1}^{N} (GOV\ VAT\ rate_{i}^{R} \times GOV\ value_{i}) \\ & + \sum_{i=1}^{N} (NPISH\ VAT\ rate_{i}^{R} \times NPISH\ value_{i}) \\ & + \sum_{i=1}^{N} \sum_{j=1}^{M} \left(IC\ VAT\ rate_{i} \times Propex_{j} \times IC\ value_{i,j}\right) \\ & + \sum_{i=1}^{N} \sum_{j=1}^{M} \left(GFCF\ VAT\ rate_{i}^{R} \times Propex_{j} \times GFCF\ value_{i,j}\right) \end{aligned} \tag{10}$$

where:

$i \in (1; 65)$ – groups of products and services,

$j \in (1; 65)$ – sectors of economic activity,

$HHC/GOV/NPISH/GFCF\ VAT\ rate_{i}^{R}$ – stand for average rates for product group *i* for household, government, NPISH, and GFCF, respectively, in the situation when reduced rates are discontinued. It is assumed that all products and services subject to reduced rates (including the exemption with the right to deduct) become taxed at standard rate at the final stage.[6]

[6] *For other notation see Equation (5).*

$$VTTL^E = \sum_{i=1}^{N}(HHC\ VAT\ rate_i^E \times HHC\ value_i) + \sum_{i=1}^{N}(GOV\ VAT\ rate_i^E \times GOV\ value_i) + \sum_{i=1}^{N}(NPISH\ VAT\ rate_i^E \times NPISH\ value_i) + \sum_{i=1}^{N}\sum_{j=1}^{M}\left(GFCF\ VAT\ rate_i^E \times GFCF\ value_{i,j}\right) \quad (11)$$

where:

$i \in (1; 65)$ – groups of products and services,

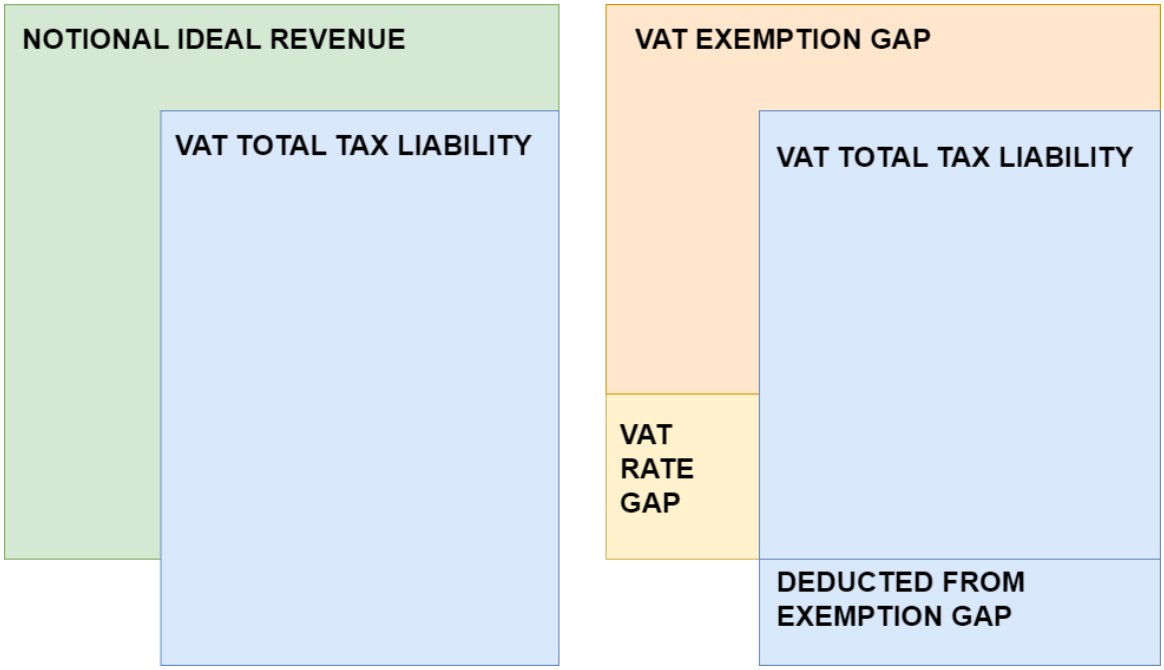
$j \in (1; 65)$ – sectors of economic activity,

$HHC/GOV/NPISH/GFCF\ VAT\ rate_i^E$ – stand for average rates for product group *i* for household, government, NPISH, and GFCF, respectively, in the situation when exemptions without the right to deduct are terminated and VAT registration thresholds are abandoned. It is assumed that $GFCF\ value_{i,j}$ contains only household, government, and NPISH GFCF, which are not deductible per se. It is also important to note that there is no liability component attributed to intermediate consumption (as all companies could deduct input VAT).[7]

The nature of the rate gap and exemption gap differs, as visualised by Figure 2. Due to exemptions without the right to deduct, part of the revenue could be considered as disjunctive from the notional ideal revenue. This is because the actual revenue is partially collected at the intermediate stage, due to the inability to deduct VAT accrued at the intermediate stage. In an ideal system, this revenue would not have been collected. Yet, the revenue collected instead at the final stage would be higher. As shown previously in Figure 1, the VAT policy gap, i.e., the sum of the rate and exemption gaps, equals the difference between the notional ideal revenue and the VTTL.

[7] *For other notation see Equation (5).*

Figure 2: Visualisation of the rate and exemption gaps



Source: own elaboration.

Using the above convention, one can decompose the rate gap and the exemption gap into components indicating the loss of the notional ideal revenue due to the implementation of reduced rates and exemptions on specific goods and services. Such additive decomposition is carried out for the computation of, as defined by EC/CASE (2015), the actionable exemption gap, which excludes the services and notional values that are unlikely to be taxed even in an ideal world. These measures exclude liability from the final consumption of "imputed rents" (the notional value of home occupancy by homeowners), the provision of public goods and services, and financial services. For these specific groups of services, charging VAT is impractical or currently goes beyond the control of national authorities.

I.d. C-efficiency

C-efficiency is an indicator of the departure of the VAT from a perfectly enforced tax levied at a uniform rate on all consumption. It is expressed as:

$$E^C = \frac{VAT\ revenue}{tC} \tag{12}$$

where, *VAT revenue* stands for VAT revenue (ESA 2010 standard), *t* for statutory standard rate, and *C* for final consumption (household, government and NPISH, net of VAT). The values of the measure could range from zero to one. However, values larger than 65 percent are rarely observed (Keen, 2013). Even in a utopian situation of full compliance and a flat rate system, C-efficiency should be considerably lower than one, as domestic final consumption in the denominator of C-efficiency is broader than the actionable VAT base.[8] In other words, if C-efficiency equalled one, revenue would be higher than the notional ideal revenue.

[8] *Total domestic final consumption includes government and NPISH consumption, which to a large extent cannot be taxed.*

II. Economic and policy context

This section presents the analysis of the economic and policy context, which are important determinants of the compliance and policy gaps. The content of this chapter is focused on 2021 and 2022, i.e., the years for the most recent full and fast estimates, respectively, not presented in the earlier vintages of the *VAT gap in the EU* study.

In 2021, both real and nominal GDP increased in all 27 EU Member States. This growth was to a large extent a result of the gradual recovery of economies from the effects of the COVID-19 pandemic and the measures introduced to limit its spread. Given this context, macroeconomic figures for 2021 are hard to compare against any other recent year. In total, the EU-27 economy grew by 5.6 percent in real terms compared to 2020 – the largest increase in GDP was recorded in Ireland (15.1 percent), Croatia (13.1 percent), and Malta (11.7 percent) (see Table 2). The recovery was relatively fast in countries strongly impacted by the COVID-19 pandemic due to their high dependence on the tourism sector. At the same time, the growth of GDP in 2021 was slower in the Member States where the recession in 2020 was milder. The slowest GDP growth was recorded in Finland (3.2 percent), Germany (3.2 percent), and Czechia (3.6 percent). In nominal terms, GDP increased by 8.1 percent. The core component of the VAT base – household consumption – increased by 6.6 percent in nominal terms. This unusually high growth rate is the effect of both the low base and consumption patterns that differ 2021 from 2020. Even higher growth was observed for GFCF – it increased on average by 12.2 percent in nominal terms. An increase was observed in all but two Member States, namely Ireland and Cyprus.

Table 2: Real and nominal growth in the EU-27 (2021, % growth of figures in national currencies)

Member State	Real GDP growth (%)	General government balance (%)	Change in unemploy-ment rate (pp)	Nominal growth (%)		
				GDP	Final consum-ption	GFCF
BE	6.3	-5.5	0.5	9.3	7.7	17.1
BG	7.6	-3.9	-0.8	15.3	14.6	19.5
CZ	3.6	-5.1	0.2	7.0	6.6	23.6
DK	6.8	3.6	-0.5	9.9	7.3	17.1
DE	3.2	-3.7	0.0	6.3	4.5	11.5
EE	8.0	-2.4	-0.7	14.5	10.4	10.9
IE	15.1	-1.6	0.3	15.7	11.4	-36.6
EL	8.4	-7.1	-2.9	9.8	6.1	33.2
ES	5.5	-6.9	-0.7	7.9	7.3	10.3
FR	6.4	-6.5	-0.1	8.0	6.4	14.2
HR	13.1	-2.5	0.1	15.4	10.9	4.4
IT	7.0	-9.0	0.2	7.6	5.4	25.6
CY	6.6	-2.0	-0.1	9.7	7.1	-3.1
LV	4.3	-7.1	-0.5	11.1	12.7	27.6
LT	6.0	-1.2	-1.4	12.7	11.5	57.6

Member State	Real GDP growth (%)	General government balance (%)	Change in unemploy-ment rate (pp)	Nominal growth (%)		
				GDP	Final consum-ption	GFCF
LU	5.1	0.7	-1.5	11.6	9.1	14.1
HU	7.2	-7.1	0.0	14.1	11.3	28.2
MT	11.7	-7.8	-1.0	13.9	9.5	11.3
NL	6.2	-2.4	-0.7	9.3	7.8	8.2
AT	4.6	-5.8	0.2	6.6	7.1	15.5
PL	6.9	-1.8	0.2	12.6	11.6	30.5
PT	5.5	-2.9	-0.4	7.1	6.1	15.5
RO	5.8	-7.1	-0.5	11.3	11.8	16.0
SI	8.2	-4.6	-0.2	11.0	12.7	21.4
SK	4.9	-5.4	0.1	7.4	6.5	19.4
FI	3.2	-2.8	0.0	5.4	5.8	3.4
SE	6.1	0.0	0.3	8.9	7.3	12.2
EU27 (EUR)	**5.6**	**-4.8**	**-0.4**	**8.1**	**6.6**	**12.2**

Source: Eurostat, download underlying data.

Note: the data presents situation as of August 2023.

Another factor influencing VAT compliance may be the level of support measures, which are often contingent on paying taxes. All in all, the **total net balance of general government** in the EU-27, which may serve as an indicator of the strength of support measures and economic situation, rose from -6.7 percent in 2020 to -4.8 percent in 2021.[9] This is a result of numerous developments, such as an improvement in the economic situation and a decline in the value of support measures in place.

VAT compliance might also be affected by changes in the structure of expenditure – changes in the share of purchases of services provided by sectors where non-compliance tends to be higher, for example those related to **tourism**, **hospitality, and entertainment** can impact overall compliance. In 2021, tourism was among the sectors that started to recover from the COVID-19 pandemic, following the easing of certain restrictions related to it, with tourist expenditure growing by 35 percent year-over-year.[10]

The number of bankruptcies – which could be treated as an indicator of broader liquidity problems – rose in the first three quarters of the year compared to the same period in 2020, with the largest increase (27.1 percent) in Q2 and smallest in Q4 (by 5.0 percent).[11] This increase could suggest that, despite the recovery, many firms suffered from the economic turbulences related to the pandemic and the gradual withdrawal of support measures.

2021 saw some important changes in EU VAT systems. From July 2021, new VAT obligations for business-to-consumer (B2C) ecommerce sellers and marketplaces are in place. These include the

[9] https://ec.europa.eu/eurostat/databrowser/view/gov_10dd_edpt1/default/table?lang=en.

[10] https://ec.europa.eu/eurostat/databrowser/view/tour_dem_extot/default/table?lang=en.

[11] https://ec.europa.eu/eurostat/databrowser/view/STS_RB_Q__custom_4329332/default/table?lang=en.

One-Stop Shop (OSS) single EU VAT return, the withdrawal of the EUR 22 import VAT exemption with the introduction of the Import One-Stop Shop (IOSS), and marketplace-deemed supplier obligations.

In 2021, several EU Member States introduced temporary changes to their VAT systems. Germany reverted to its standard rate in January 2021 after temporarily reducing it in 2020 as a measure to stimulate the economy amidst the pandemic. Ireland had a temporary reduction in VAT that lasted until February 2021, after which it reverted to its normal rate. Sector-specific adjustments were also prevalent across various countries. Several countries implemented measures to mitigate high energy costs. Cyprus, Czechia, and Spain introduced a temporary reduction in VAT rates on electricity consumption. Numerous countries introduced changes to VAT rates for products and services associated with the COVID-19 pandemic. For example, Bulgaria implemented a 0 percent rate on COVID-19 vaccines and diagnostic devices, a measure matched by Luxembourg and Austria. France extended the reduced VAT rate on masks, protective clothing, and products associated with personal hygiene until the end of 2021.

In the hospitality sector, a reduced rate was applied in Austria to non-alcoholic beverages until the end of 2021. In Hungary, VAT on takeaway meals was temporarily reduced in November 2020 to 5 percent until February 2021. Latvia introduced the use of a reduced VAT rate on specific fresh fruits, berries, and vegetables in January 2021. Several countries aimed to boost their hospitality and tourism sectors. In Czechia, Germany, Greece, and Austria, the reduced rate for tourism and hospitality services that was introduced in mid-2020 was extended until the end of 2021. In Lithuania, the rate reduction was implemented for the entire duration of 2021. In Belgium, a temporary reduced VAT rate for the demolition and reconstruction of homes, which initially applied to 32 specific areas, was expanded to cover the entire territory and extended until December 2023 (for more details, see Chapter VII and Table 3).[12]

[12] https://www.globalvatcompliance.com/globalvatnews/vat-rates-in-europe-2021/.

Table 3: VAT rate structure as of 1 January 2021 and changes during 2021 (%)

Member State	Standard rate	Reduced rate(s)	Super-reduced rate	Parking rate	Changes during 2021	Effective rate[13]
BE	21	6 / 12	-	12	-	**9.9**
BG	20	9	-	-	-	**13.5**
CZ	21	10 / 15		-	-	**11.8**
DK	25	-	-	-	-	**15.3**
DE	19	7	-	-	Statutory rates back to 19/7 from 16/5 (Jan 2021)	**10.2**
EE	20	9	-	-	-	**12.8**
IE	21	9 / 13.5	4.8	13.5	Standard rate back to 23 (Mar 2021)	**11.7**
EL	24	6 / 13	-	-	-	**10.9**
ES	21	10	4	-	-	**8.6**
FR	20	5.5 / 10	2.1	-	-	**9.7**
HR	25	5 / 13	-	-	-	**15.5**
IT	22	5 / 10	4	-	-	**9.5**
CY	19	5 / 9	-	-	-	**11.3**
LV	21	5 / 12		-	-	**11.4**
LT	21	5 / 9	-	-	-	**13.0**
LU	17	8	3	14	-	**11.5**
HU	27	5 / 18	-	-	-	**14.4**
MT	18	5 / 7	-	-	-	**13.8**
NL	21	9	-	-	-	**10.7**
AT	20	5 / 10 / 13	-	13	-	**10.4**
PL	23	5 / 8	-	-	-	**11.9**
PT	23	6 / 13	-	13	-	**11.1**
RO	19	5 / 9	-	-	-	**12.3**
SI	22	5 / 9.5	-	-	-	**11.4**
SK	20	10	-	-	-	**10.6**
FI	24	10 / 14	-	-	-	**12.2**
SE	25	6 / 12	-	-	-	**13.9**

Source: TAXUD, VAT Rates Applied in the Member States of the European Union: Situation of 1st January 2021, download underlying data.

[13] *The effective rate is the ratio of the VTTL and the tax base. See methodological considerations in Annex A.*

III. VAT compliance gap in the EU

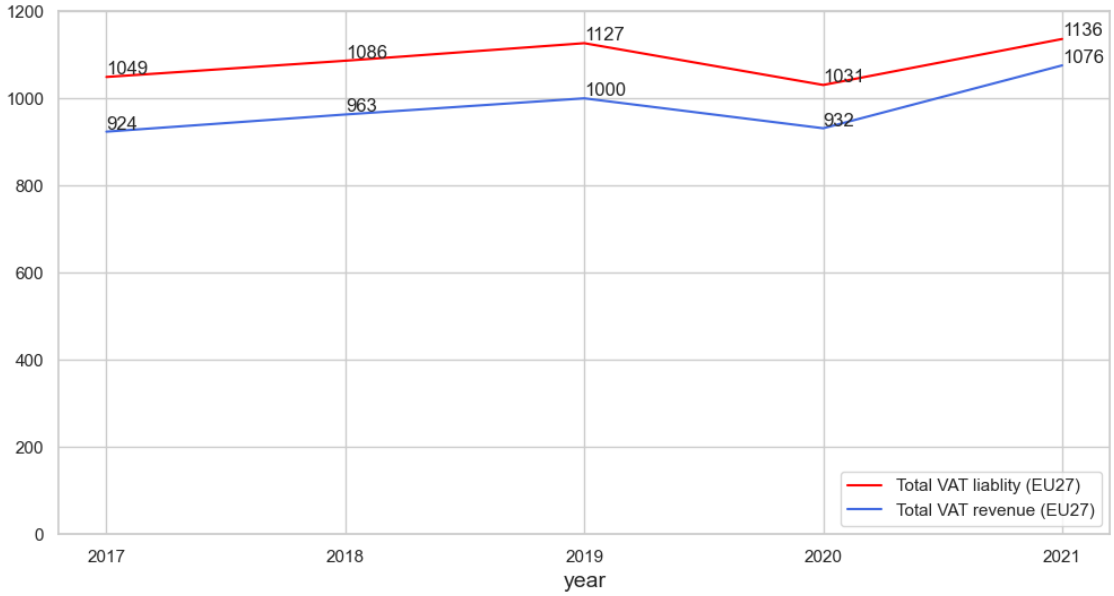
III.a. Evolution of VAT compliance between 2017 and 2021

This section looks at the evolution of the VAT compliance gap over the time horizon of 2017-2021. It aims to provide an overview, while the following Chapters VI and VI provide comprehensive insights to developments of the VAT gaps in certain Member States.

As shown by Figure 3, total EU-27 VAT revenue and VAT liability increased in all years with the exception of 2020, where both fell below the levels observed in 2017. In 2021, revenue and liability recovered and exceeded the values observed before the COVID-19 pandemic. Amid these extraordinary conditions, the VAT compliance gap continued to narrow albeit at a significantly faster pace. In fact, the rate of that narrowing was even faster in the two most recent years – 1 percentage point (pp) in 2020 and 4.3 pp in 2021 as compared to the 0.6 pp average decrease between 2017 and 2019.

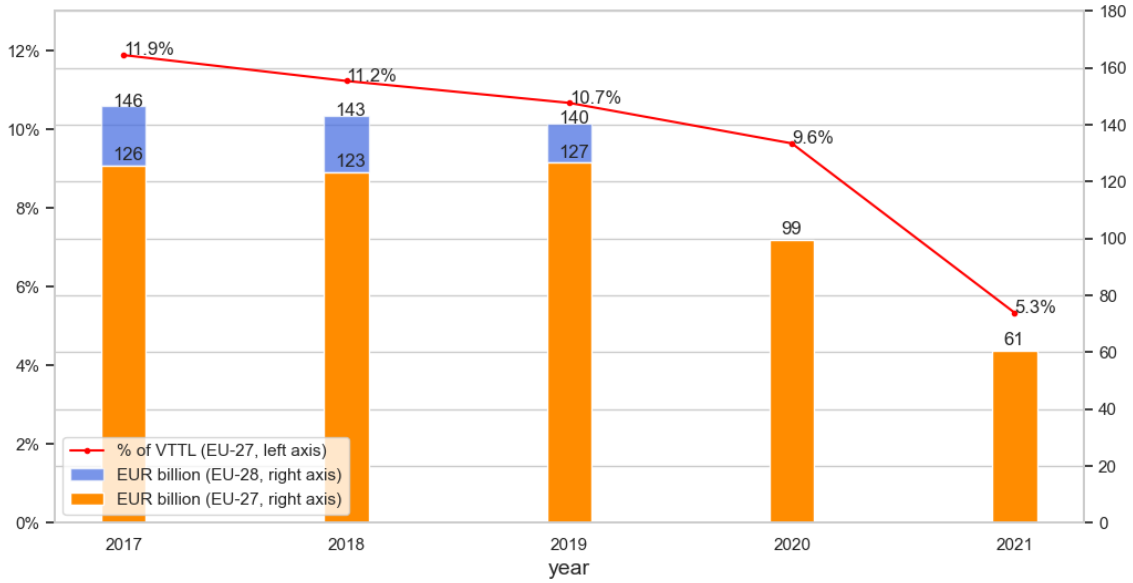
In 2021, the VAT compliance gap amounted to EUR 60.6 billion or – in relative terms – 5.3 percent of the VTTL. Compared to 2020, the gap went down by EUR 38.7 billion or 4.3 percent of the VTTL. There remains, however, some degree of uncertainty around the estimates for 2020 and 2021 due to the somewhat inconsistent treatment of deferrals and the lowered quality of national statistics owing to the turbulent conditions in these years. Because of this, the revisions in this study are comparatively larger than in previous years. Overall, between 2017 and 2021, the gap in the EU-27 declined by EUR 65 billion, or in relative terms, by 6.6 pp (see Figure 4).

Figure 3: Evolution of VAT liability and revenue in the EU-27 (EUR billion, 2017-2021)



Source: own calculations, download underlying data.

Figure 4: Evolution of the VAT compliance gap in the EU-27 and EU-28 (% of the VTTL and EUR billion, 2017-2021)[14]



Source: own calculations, download underlying data.

Looking at Member State-level estimations, in 2021, the variation and scale of the VAT compliance gap year-over-year changes were much larger compared to previous years – changes ranged from -10.7 pp to 0.7 pp. In most (16) Member States, the year-over-year change in the VAT compliance gap exceeded 3 pp (see Table 4 and Figure 6). In a typical year in the last decade the number of countries with such significant change in VAT compliance gap did not exceed eight. Overall, the VAT compliance gap increased in only two EU-27 Member States – Denmark (by 0.7 pp) and Sweden (by 0.2 pp).

The largest decreases in the size of the VAT compliance gap were observed in Italy (-10.7 pp), Cyprus (-9.2 pp), Poland (-7.8 pp), Belgium (-6.7 pp), and Ireland (-6.0 pp). Such large decreases in the gap in times of economic recession may seem unintuitive – difficult economic conditions should decrease in theory the liquidity of businesses, which would result in a failure to fulfil some obligations, including VAT liabilities. Positive changes in compliance might have been caused by support measures contingent on paying taxes and reducing the frequency of bankruptcies. Another cause of the observed fall in the VAT compliance gap might be related to changes in the structure of household consumption towards categories and channels where compliance is generally higher (e.g., online shopping) and the increased share of cashless payments.

The estimates of the VAT compliance gap for the majority of the Member States ranged from 0 to 10 percent of the VTTL (see Figure 5). The smallest compliance gap was observed in the Netherlands (-0.2 percent), Finland (0.4 percent), Spain (0.8 percent) and Estonia (1.4 percent). Negative estimates are clearly not possible, but in Member States where non-compliance is already very low, they can occur due to statistical and measurement errors (see further discussion in Section VII.c). On the opposite side of the ranking are Romania (36.7 percent), Malta (25.7 percent), Greece

[14] *It is important to note that the 2020 results are presented for the EU-27, accounting for BREXIT in January 2020. As a reference, the EU-28 estimates including the UK are presented in some graphs and tables until year 2019.*

(17.8 percent), and Lithuania (14.5 percent). In nominal terms, the largest gaps were estimated in Italy (EUR 14.6 billion), France (EUR 9.5 billion) and Romania (EUR 9.0 billion). The median VAT compliance gap was 4.9 percent of the VTTL, which is now closer to the average, showing some convergence of the Member States with higher VAT compliance gaps.

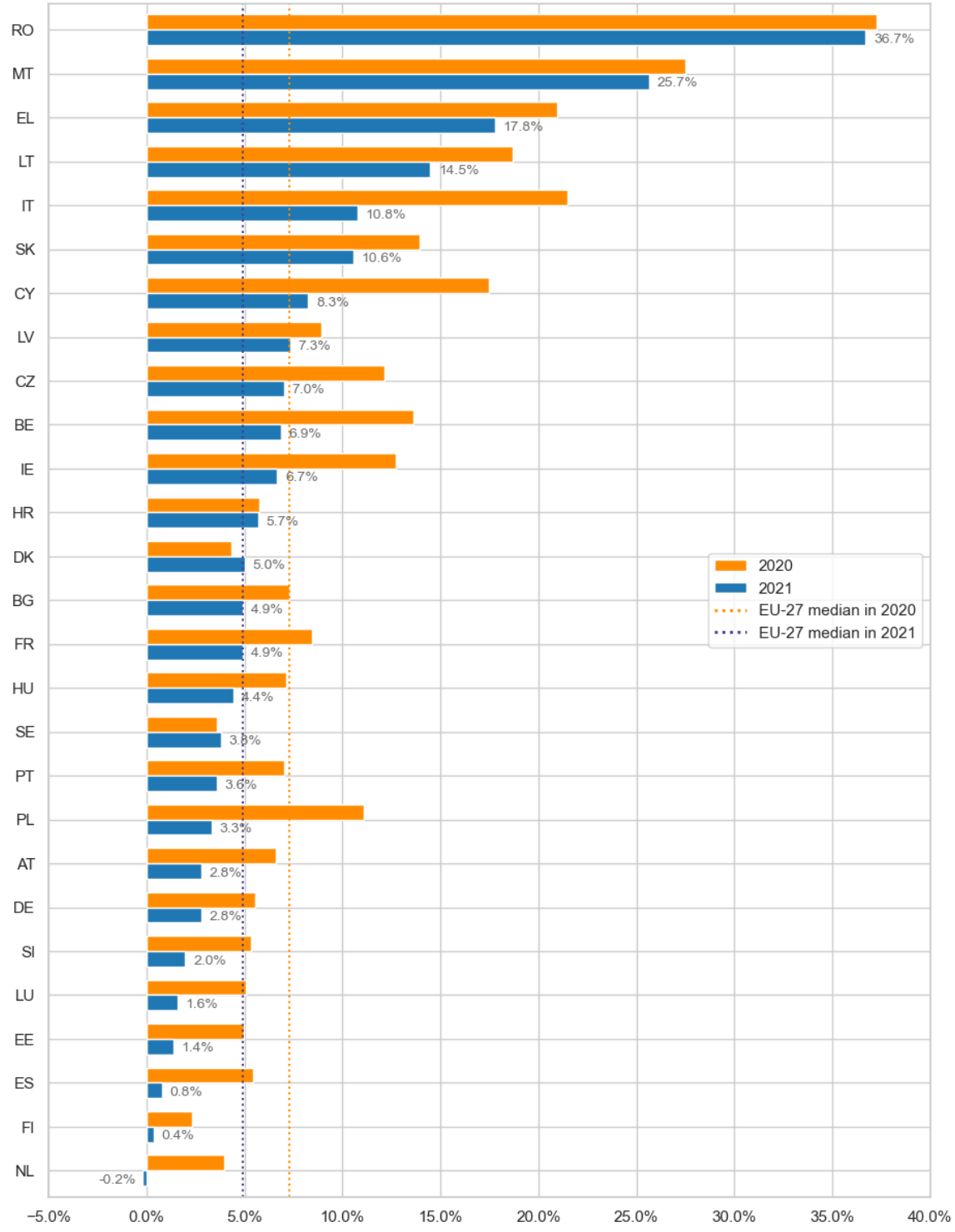
Table 4: VAT compliance gap as a percent of the VTTL in EU-27 Member States (2020 and 2021)

	2020				2021				VAT gap change (pp)
MS	VTTL (EUR mln)	Revenues (EUR mln)	VAT gap (EUR mln)	VAT gap (%)	VTTL (EUR mln)	Revenues (EUR mln)	VAT gap (EUR mln)	VAT gap (%)	
BE	33 898	29 282	4 616	13.6%	36 834	34 304	2 530	6.9%	-6.7
BG	6 076	5 635	442	7.3%	7 018	6 671	347	4.9%	-2.3
CZ	18 236	16 022	2 214	12.1%	19 440	18 078	1 362	7.0%	-5.1
DK	32 475	31 073	1 402	4.3%	35 398	33 618	1 780	5.0%	0.7
DE	234 602	221 562	13 040	5.6%	266 845	259 385	7 460	2.8%	-2.8
EE	2 599	2 469	129	5.0%	2 887	2 847	40	1.4%	-3.6
IE	15 770	13 765	2 004	12.7%	16 708	15 592	1 116	6.7%	-6.0
EL	16 351	12 925	3 426	21.0%	18 173	14 942	3 231	17.8%	-3.2
ES	73 447	69 435	4 012	5.5%	82 912	82 250	662	0.8%	-4.7
FR	176 449	161 537	14 912	8.5%	194 283	184 731	9 552	4.9%	-3.5
HR	6 710	6 322	388	5.8%	8 108	7 647	461	5.7%	-0.1
IT	126 968	99 669	27 299	21.5%	135 580	120 980	14 600	10.8%	-10.7
CY	2 164	1 786	378	17.5%	2 378	2 182	197	8.3%	-9.2
LV	2 790	2 541	250	9.0%	3 079	2 854	225	7.3%	-1.6
LT	4 929	4 009	920	18.7%	5 482	4 688	795	14.5%	-4.2
LU	3 941	3 741	200	5.1%	4 414	4 344	70	1.6%	-3.5
HU	14 460	13 429	1 031	7.1%	15 938	15 230	709	4.4%	-2.7
MT	1 171	849	322	27.5%	1 346	1 001	345	25.7%	-1.8
NL	61 407	58 971	2 436	4.0%	65 254	65 400	- 146	-0.2%	-4.2
AT	30 133	28 136	1 997	6.6%	31 551	30 668	883	2.8%	-3.8
PL	47 085	41 856	5 229	11.1%	51 010	49 317	1 694	3.3%	-7.8
PT	18 071	16 804	1 267	7.0%	19 821	19 108	713	3.6%	-3.4
RO	21 304	13 368	7 936	37.3%	24 507	15 511	8 996	36.7%	-0.5
SI	3 754	3 553	201	5.4%	4 386	4 299	87	2.0%	-3.4
SK	7 925	6 820	1 104	13.9%	8 236	7 366	871	10.6%	-3.4
FI	22 527	22 005	522	2.3%	23 641	23 551	90	0.4%	-1.9
SE	45 625	43 981	1 644	3.6%	51 151	49 215	1 935	3.8%	0.2
Total (EU-27)	**1 030 868**	**931 545**	**99 323**	**9.6%**	**1 136 381**	**1 075 778**	**60 603**	**5.3%**	**-4.3**
Median (EU-27)				**7.3%**				**4.9%**	

Source: own calculations, download underlying data.

Note: numbers may not add up due to rounding.

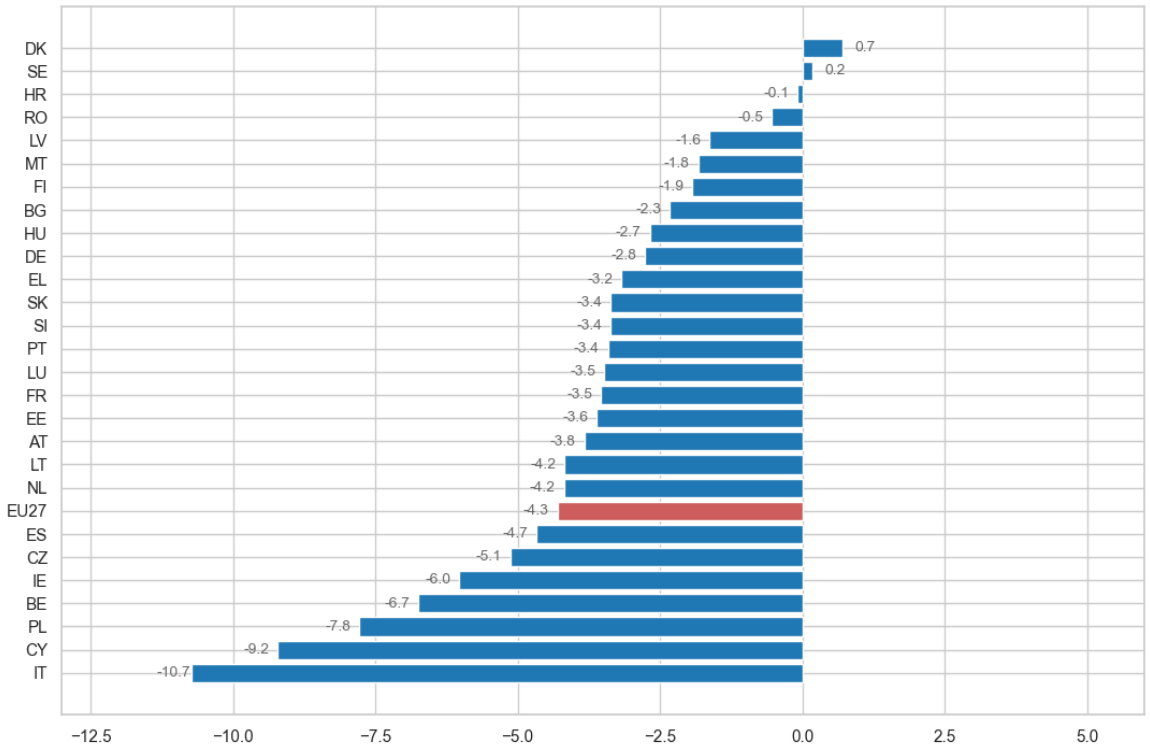
Figure 5: VAT compliance gap by Member State (as % of VTTL, 2020 vs. 2021)



Source: own calculations, download underlying data.

Note: The dotted lines depict the median VAT compliance gap in the EU-27 in 2010 (orange) and 2021 (blue). Labels indicate the VAT compliance gap in 2021 in the respective Member State.

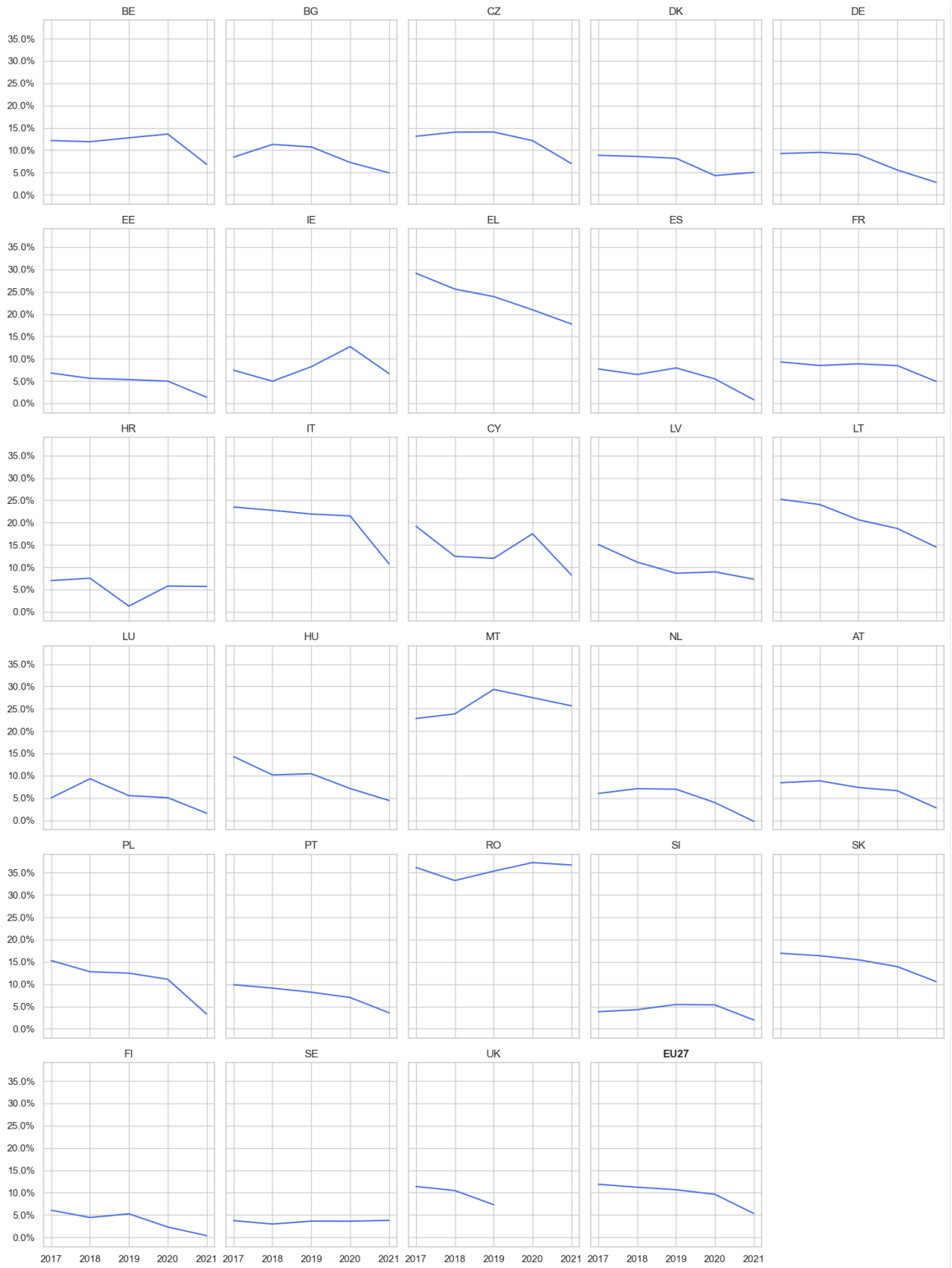
Figure 6: Change in the VAT compliance gap (in percentage points, 2021 vs. 2020)



Source: own calculation, download underlying data.

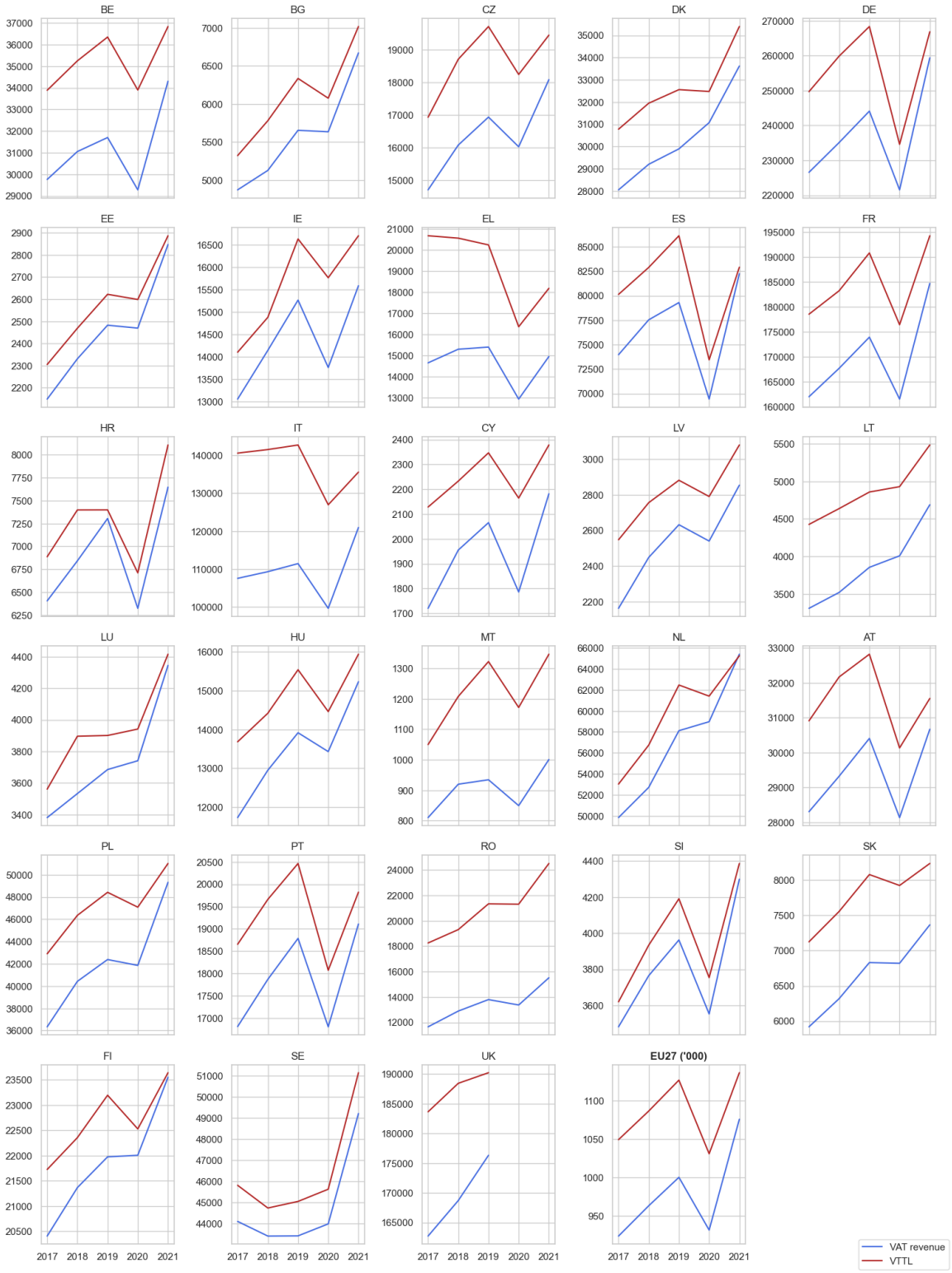
Note: EU-27 figure stands for the simple average.

Figure 7: VAT compliance gap in EU Member States (as % of VTTL, 2017-2021)



Source: own calculations, [download underlying data](#).

Figure 8: VAT revenue and VTTL in EU Member States (EUR million, 2017-2021)



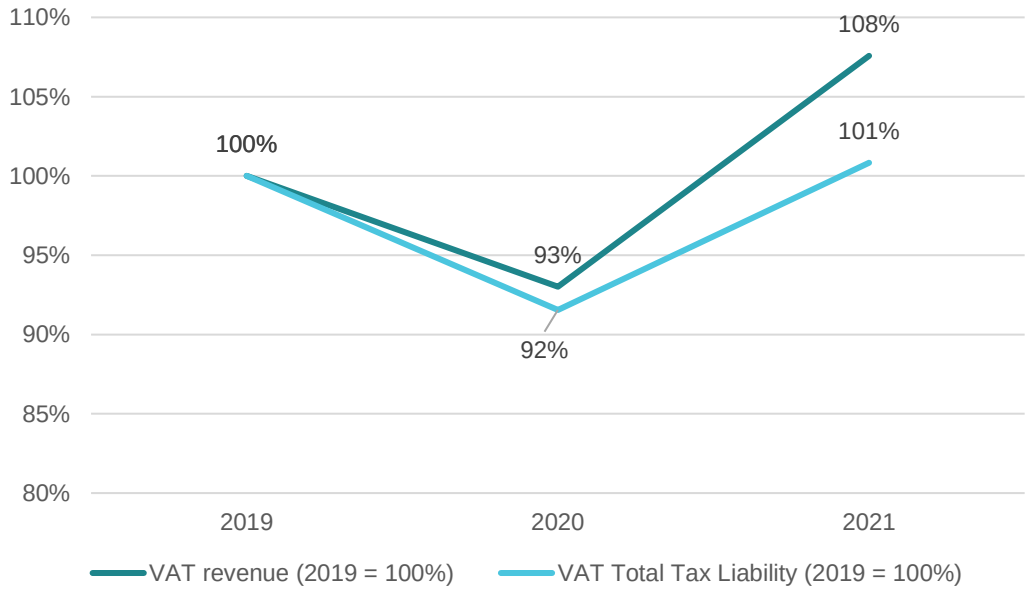
Source: own calculations, [download underlying data](#).

III.b. Robustness of the decline in the EU-wide compliance gap between 2019 and 2021

The unprecedented decline of the EU-wide VAT compliance gap of over EUR 65 billion and over 5 pp between 2019 and 2021 calls for a thorough examination of the underlying data sources and assumptions. This section looks at both the potential drivers of this change and the accuracy issues that might have affected the estimated trajectory of the VAT compliance gap in recent years. A more comprehensive discussion on the accuracy of the VAT compliance gap estimates is presented in Section VII and the analysis of determinants of the VAT compliance gap trajectories in selected groups of countries is discussed in Sections III.c-f.

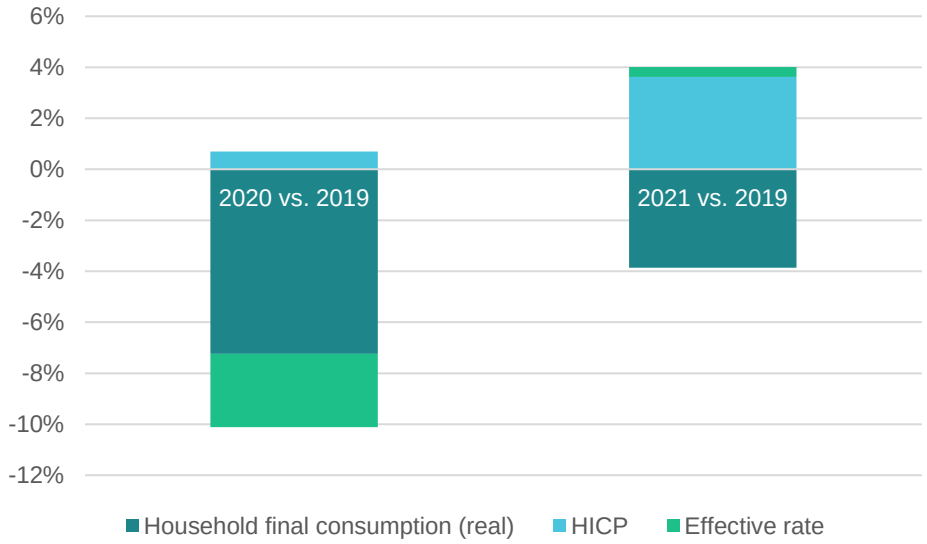
An analysis of the evolution of the VAT revenue, the VTTL, and its components could help illuminate the reasons behind this sharp decline. First, as shown by Figure 9, the change in the VAT compliance gap between 2019 and 2021 was driven primarily by shifts in the VAT revenue, whereas the estimated VTTL in 2021 was nearly identical to its value observed in 2019, before the COVID-19 pandemic. This suggests that the changes in the VAT compliance gap result from shifts in "recorded values" rather than changes in the estimated "unobserved" revenue potential. The stability of the VTTL was accompanied by the stability of its two main components, the nominal base and the effective rate. The former element, the estimation of which is the main analytical task of this study, has remained nearly identical to that of 2019 (a slight increase of 0.4 percent). The base remained stable as the growth of prices was neutralized by the decline in the real values of household final consumption (see Figure 10).

Figure 9: Evolution of the VTTL and VAT revenue (2019 = 100%)



Source: own elaboration.

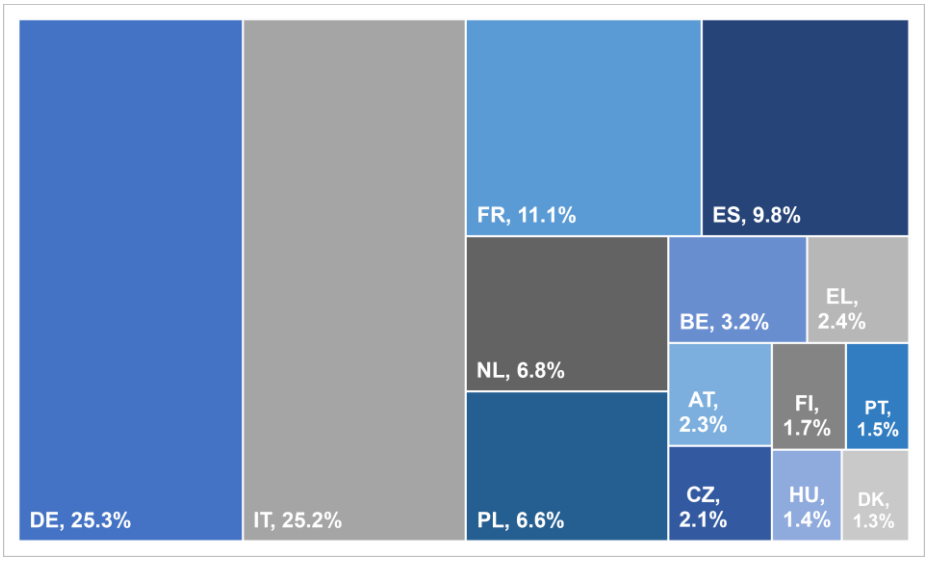
Figure 10: Evolution of the tax base components (% change)



Source: own elaboration.

The contributions to the decline of the EU-wide VAT compliance gap broken down by Member State could shed some more light on the pattern observed. This examination shows that two Member States contributed to over 50 percent of the decline of the EU-wide compliance gap between 2019 and 2021, with six Member States contributing to over 80 percent of this change (see Figure 11). While the impact of the shifts of the gap in Germany, France, and the Netherlands are not greater than the relative sizes of their VAT bases, the contribution of Italy, Poland, and Spain is substantially above the relative size of their tax bases (11.9 percent, 7.3 percent, and 4.5 percent, respectively, in 2021). Thus, the change in the EU-wide VAT compliance gap can be primarily explained by the rapid developments in these relatively large economies.

Figure 11: Contributions to VAT compliance gap decline between 2019 and 2021 by Member State



Source: own elaboration.

The estimated drop in the baseline VAT compliance gap estimates in Italy reached 11.1 pp in the two-year period between 2019 and 2021. Yet, according to the information shared by the Italian authorities, the baseline estimates for 2021 based on Eurostat VAT revenue figures are underestimated by approximately 2 pp. This results from the non-inclusion of changes in the stock of VAT credit not accounted for in the figures published by Eurostat. The bulk of the drop in the compliance gap, i.e., approximately 9 pp, appears to be related to a permanent increase in compliance rather than temporary unexplained shifts or inaccuracies. This is confirmed by the further increase of VAT receipts in 2022. According to the fast estimates, the VAT compliance gap continued to decline in 2022.

Similar to Italy, the pace of revenue growth in Spain in 2022 (approximately 13 percent growth, as compared to 11.5 percent growth in household final consumption) suggests that the decline of the gap in Spain is also not a one-off unexplained deviation. As noted by the authorities, national account figures for Spain are expected to be revised, which could lead to further revisions of the VTTL and VAT compliance gap estimates in subsequent studies.

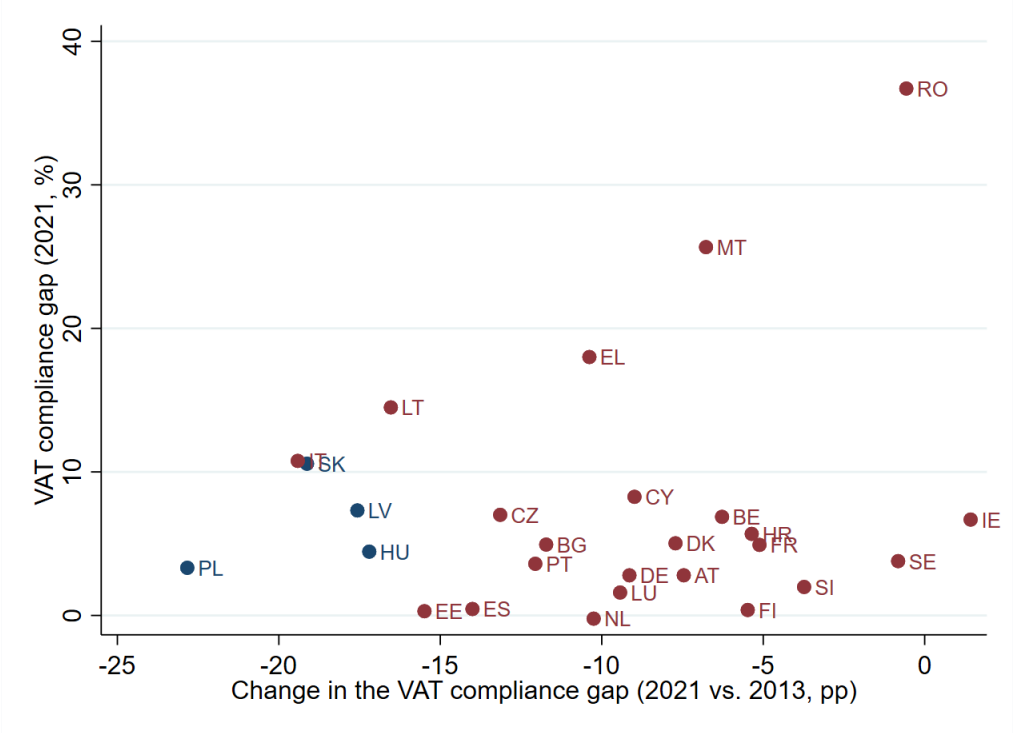
Contrary to Spain and Italy, in 2022, VAT revenue in Poland stagnated (decrease of 0.8 percent) despite a substantial increase in the tax base (estimated at 17 percent). Yet, this change is not necessarily being driven by the expected increase of the estimated VAT compliance gap. In 2022, in response to elevated consumer price inflation, Poland decreased or eliminated VAT (0 percent rate) on selected components of household consumption, including foodstuffs, electricity, heat, and fuels. Consequently, the time character of the shifts in compliance beyond 2021 cannot be accurately assessed at this stage.

To summarise, although there is some uncertainty around certain components of the calculation, much of the reduction in compliance appears to be robust and justified by the sharp increase in VAT receipts. Although the estimates of the VAT compliance gap are subject to revision due to future updates of national accounts figures, a substantial revision of the EU-wide trend of VAT compliance is unlikely.

III.c. Latvia, Hungary, Poland, and Slovakia – success stories case study

Since 2013, when the EU-wide VAT compliance gap reached the highest level (see: Figure 89), VAT compliance gaps have decreased in nearly all Member States. Despite this rather stable and homogeneous trend, four Member States stand out from the observed pattern. These Central and Eastern Europe countries, namely Latvia, Hungary, Poland, and Slovakia, recorded an exceptionally large improvement in VAT compliance, with VAT gaps falling between 2013 and 2021 by over 15 pp. Furthermore, before the steep downward trend commenced, the gaps in these four Member States were significantly above the EU median. Currently, they belong to the best performers in the EU (see Figure 12). In addition to a geographical pattern, the increase in taxpayer compliance in the comparators was in line with the intensity of the tax administration reforms and the variety of measures introduced. It was also correlated with positive economic tailwinds. Between 2013 and 2021, real GDP increase in the EU-27 by ca. 12.9 percent, while the economies of Latvia, Hungary, Poland, and Slovakia expanded by 21.7 percent, 30.3 percent, 36 percent, and 22.5 percent, respectively.

Figure 12: Level of the VAT compliance gap in 2021 and its change between 2013 and 2021 (EU-27)



Source: own elaboration.

Latvia

Since 2013, the VAT compliance gap in Latvia has decreased by 18 pp, and since 2009 – by 31 pp. The decline in the VAT compliance gap occurred alongside the introduction of new tax administration measures. Importantly, in 2011, Latvia introduced the obligation for all VAT taxable persons to submit detailed transactional data through the Electronic Declaration System.[15] Likely thanks to the economic recovery after the global financial crisis of 2007-2008 and the better availability of information on taxpayers and their transactions than in other Members States, Latvia showed its first significant signs of improvement in VAT compliance in 2010. The steep downward trend continued between 2013 and 2021, with the largest drop observed in 2016, the year when the Latvian government introduced a domestic reverse charge mechanism targeting certain IT and electronic equipment, cereals, and precious metals suspected of being traded by fraudsters (see Figure 13). The scope of the domestic reverse charge mechanism has since been further broadened. Since 2017, it also covers deliveries of scrap metal and semi-finished metal products.[16] In its reform program, apart from the crackdown on Missing Trader Intra-Community (MTIC) fraud, Latvia has also focused its efforts on VAT gap monitoring and the effectiveness of the audit function, i.e., through a program financed by the Structural Reform Support Service and conducted by the World Bank.[17] As part of this program, among others, the World Bank team assisted the State Revenue Service of Latvia in initiating an *invoice lottery*. This enabled a comparison of customer receipts with official

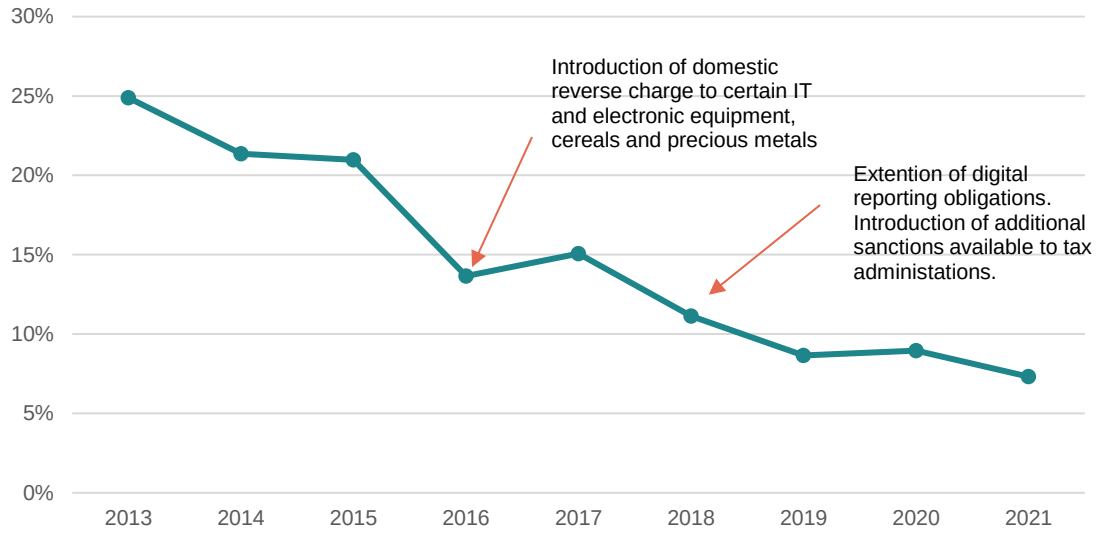
[15] https://ec.europa.eu/digital-building-blocks/wikis/display/DIGITAL/eInvoicing+in+Latvia

[16] https://eur-lex.europa.eu/resource.html?uri=cellar:81b969a5-22bf-11e8-ac73-01aa75ed71a1.0001.02/DOC_2&format=PDF

[17] https://pubdocs.worldbank.org/en/624211599709335469/Gov-Results-Story-Latvia-3.pdf

business records, targeting tax enforcement and incentivising VAT compliance. Additionally, in order to mitigate the risk of fictitious transactions, Latvia extended reporting obligations for smaller transactions. As of 2018, a detailed itemisation of all transactions is required starting from the EUR 150 registration threshold. At the same time, the rights of the tax administration to suspend economic activity of a taxpayer due to violations of laws and regulations were broadened also for cases when a taxpayer has not settled late tax liabilities subject to recovery. In 2019, the competences of tax administration were further expanded by additional rights to initiate de-registration procedures from the VAT registry.

Figure 13: Development of the VAT compliance gap in Latvia and tax administration reforms (2013-2021)



Source: own elaboration.

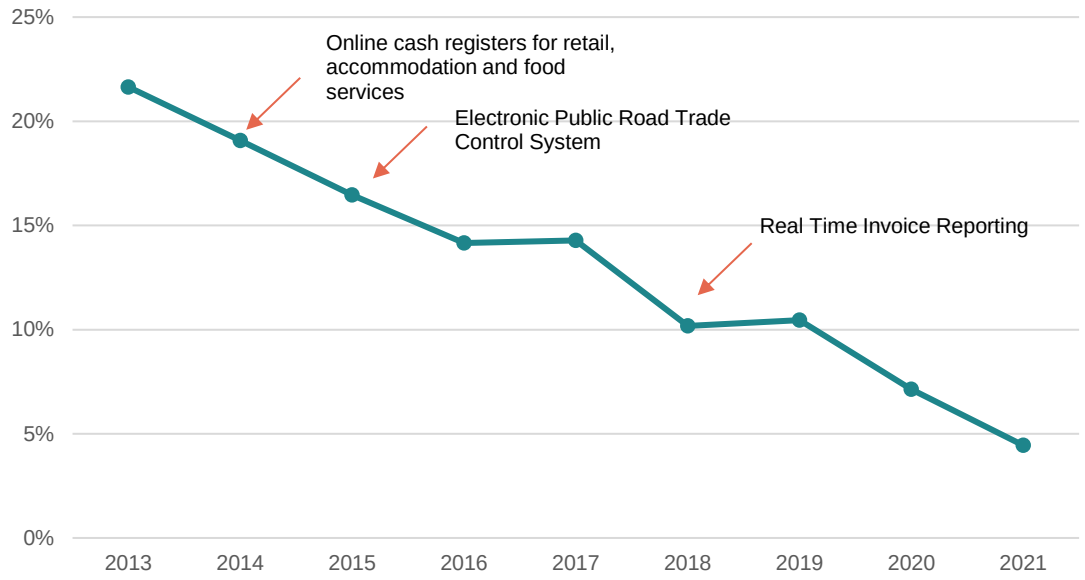
Hungary

On its path to increase VAT compliance, Hungary has implemented multiple instruments to combat MTIC fraud as well as one of the most far-reaching electronic systems for monitoring of taxpayers. In 2014, following the countries that implemented electronic fiscal devices after their first implementation in Italy in 1983, Hungary introduced online cash registers in the retail, accommodation, and food services sectors. By 2016, almost 200 000 online cash registers connected to the tax authority's systems had been introduced by around 100 000 enterprises.[18] In 2015, Hungary commenced the real-time monitoring of movements of risky goods through the Electronic Public Road Trade Control System (EKÁER). The system was a response to the large-scale MTIC fraud that often involved the phantom movements of goods. In its struggle to eliminate MTIC fraud, Hungary implemented and extended the application of the reverse charge mechanism (in 2013, 2015, and 2017). The most far-reaching tool and obligation – the real-time reporting requirement – was implemented in 2018. Thanks to this reform, companies in Hungary were required to provide data on all invoices with a VAT amount exceeding HUF 100 000 (ca. EUR 300) to the tax authorities in real time. This requirement was expanded in 2020 to cover all invoices issued,

[18] https://www.econstor.eu/bitstream/10419/241066/1/mnb-op-137-final.pdf.

regardless of the VAT amount, and from 2021, to include invoices received as well. The gradual extension of the scope of reporting obligations and monitoring to cover more sectors and smaller transactions was reflected in the trend of the VAT compliance gap. Between 2015 and 2021, the average year-over-year reduction in the VAT compliance gap was ca. 2.2 pp (see Figure 14).

Figure 14: Development of the VAT compliance gap in Hungary and tax administration reforms (2013-2021)



Source: own elaboration.

Poland

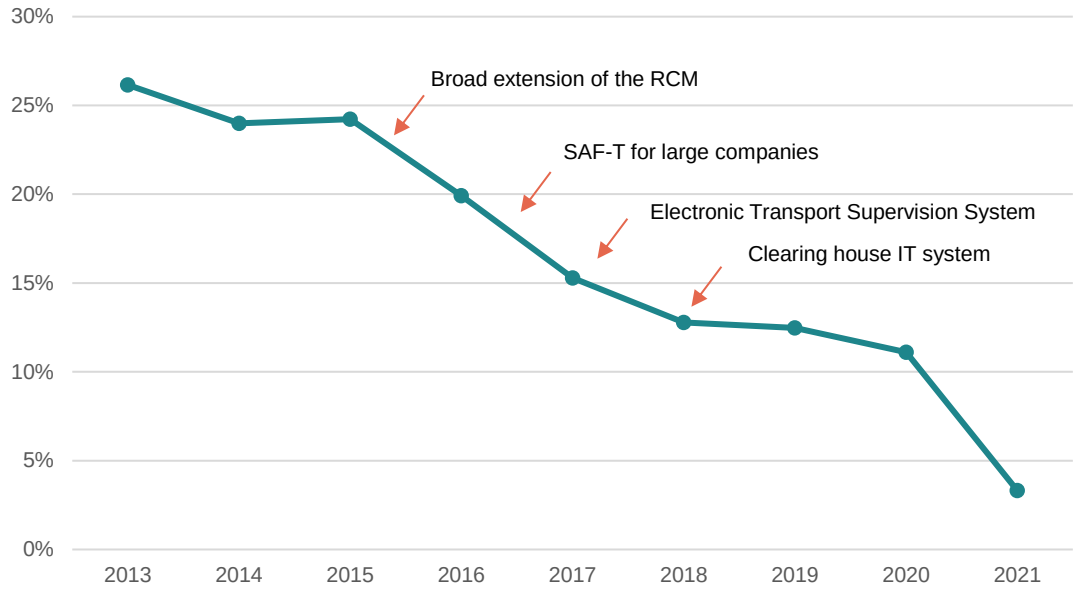
Similar to Hungary, Poland has made great strides in reducing its VAT compliance gap by extending its reporting obligations, monitoring, and implementing measures targeting large-scale intra-Community VAT fraud. Notably, in 2016, Poland introduced a national version of the Standard Audit File for Tax (SAF-T) developed by the OECD. Initially, the reporting obligation was introduced for large enterprises, but its scope was gradually extended leading to its widespread use by all 1.6 million taxpayers. By October 2020, it had entirely supplanted regular monthly VAT returns. In addition to gathering transactional data, Poland has also decided to monitor movements of goods and third-party data through the Electronic Transport Supervision System (SENT) introduced in 2017. In 2018, the government initiated a clearing house IT system designed to combat tax fraud by fostering data exchange between tax authorities and banks (STIR). Through STIR, tax authorities gained access to detailed information about companies' bank accounts, supporting the detection of fictitious transactions and enabling temporary account blockage in case of detected fraud.

The increased availability of information required an increase in the human resource capacity of the administrations. Poland decided to consolidate its tax administration, customs services, and fiscal audit services into the single National Revenue Administration with new, wider powers and improved tools. Poland has also introduced a large taxpayer office specialised in promoting and enforcing the compliance of the few taxpayers that bring in the majority of the VAT revenue.

Similar to Latvia and Hungary, Poland has implemented specific measures to combat MTIC fraud. July 2018 saw the voluntary introduction of the split payment mechanism, limited to business-to-

business (B2B) transactions. From November 2019, the use of the split payment mechanism was made mandatory for invoices surpassing PLN 15 000 (ca. EUR 3 300) for some goods or services. Additionally, the Polish Ministry of Finance issued the Whitelist of Taxpayers in 2019. This list included company names, addresses, tax IDs, and bank account numbers and required companies to verify their vendors. Poland has also implemented and extended the use of the reverse charge mechanism (in 2013, 2015, and 2017). Since 2015, when the reverse charge mechanism was extended among others to steel, steel products, scrap metal, waste, and precious metals, the VAT compliance gap has consistently decreased by 3.6 pp year-over-year on average (see Figure 15).

Figure 15: Development of the VAT compliance gap in Poland and tax administration reforms (2013-2021)



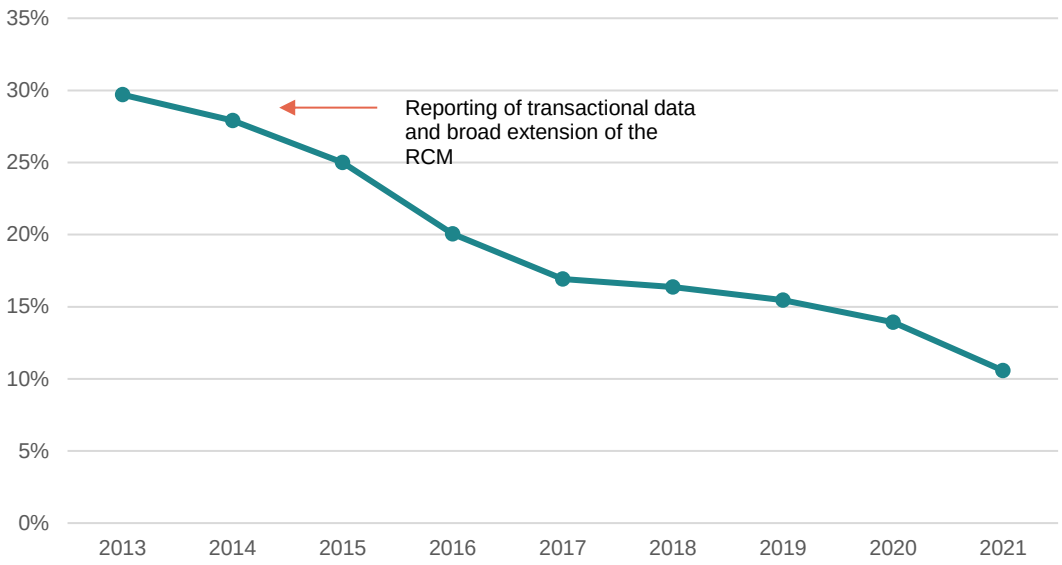
Source: own elaboration.

Slovakia

Slovakia has followed a similar pattern, but with an even more stable improvement in its VAT compliance gap (Figure 16). In Slovakia, the period of the fastest decline started just after the introduction of the obligation to supplement VAT returns with detailed transactional data as of 2014. Since then, the obligation has been applied to all VAT taxable persons and all domestic and intra-EU transactions.[19] Similar to other countries in the region, Slovakia has also extended the reverse charge mechanism from 2014 to cover, among others: selected articles of iron and steel, selected agricultural crops, mobile telephones, and integrated circuit devices such as microprocessors and central processing units.

[19] https://op.europa.eu/en/publication-detail/-/publication/818e4799-0967-11ed-b11c-01aa75ed71a1/language-en/format-PDF/source-search.

Figure 16: Development of the VAT compliance gap in Slovakia and tax administration reforms (2013-2021)



Source: own elaboration.

III.d. Romania – case study of high and persistent VAT compliance gap

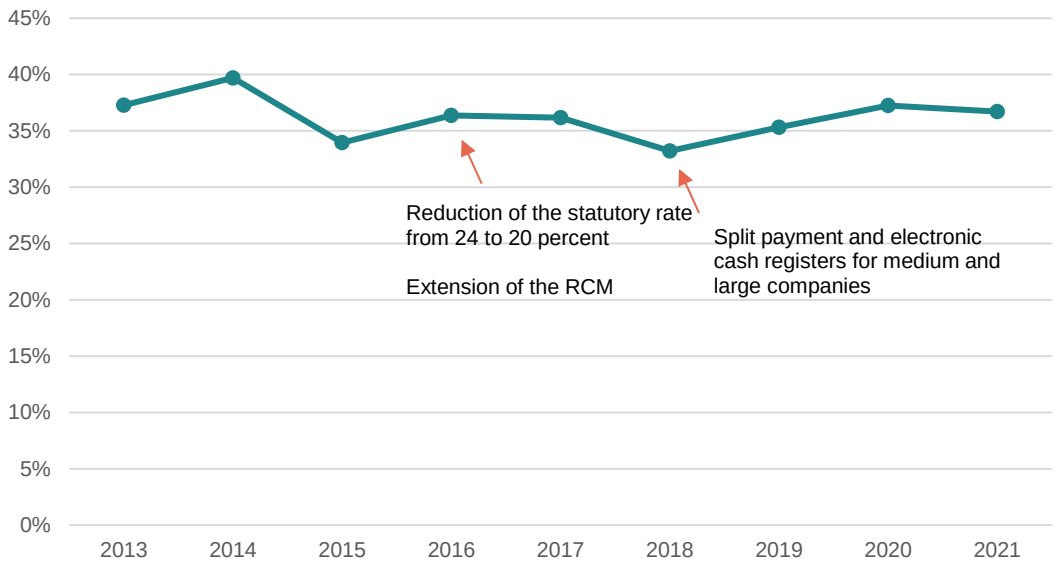
In contrast to the previous EU countries, Romania has seen a persistent and high VAT compliance gap over the last years. Since 2000, the first year covered by the VAT gap in the EU Study, the VAT compliance gap fluctuated above the 30 percent threshold. In addition, the VAT compliance gap was substantially higher than in any other Member States during the entire period between 2000 and 2021. Between 2013 and 2021, it ranged from 33.2 to 39.7 percent of the VTTL (see Figure 17).

The gap remained high despite favourable conditions to improve VAT compliance. Overall, between 2013 and 2021, the Romanian economy grew by 34 percent in real terms. Moreover, the government significantly reduced the VAT burden by reducing the standard statutory rate by 4 pp in January 2016 and by a further 1 pp in 2017. This large downward shift of the rate did not have any visible impact on the development of the VAT compliance gap.

The actions taken by the Romanian administration are in line with the actions taken by Latvia, Hungary, Poland, and Slovakia. In its crackdown on MTIC fraud, Romania introduced and extended its domestic reverse charge mechanism (in 2013 and 2016). The scope of goods and services covered after the second extension was relatively broad and covered among others the supply of: waste, wood, cereals, electricity, construction works, mobile phones, tablets, and laptops. Romania also introduced a mandatory split payment mechanism on taxable persons and public institutions which have tax arrears or which are subject to insolvency proceedings. The mechanism was in place between 2018 and 2020.[20] In addition, in 2018, Romania introduced electronic cash registers for medium and large firms.

[20] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0666

Figure 17: Development of the VAT compliance gap in Romania and tax administration reforms (2013-2021)



Source: own elaboration.

Similar measures introduced, the macroeconomic situation, and other factors such as the popularity of digital payments or the corruption index, do not clearly distinguish Romania from the group of Member States that saw significant improvement in VAT compliance. A pronounced difference lies in the digital reporting of VAT transactions between Romania and the latter group. In contrast to Latvia, Hungary, Poland, and Slovakia, up until 2022, VAT-payers in Romania were not obliged to report their transactional data. This, in turn, likely had a negative impact on the effectiveness of tax enforcement. Moreover, tax audits were considered inefficient by international standards.[21] Yet, the National Tax Administration Agency recently changed its modus operandi. As of 2022, large companies are now obliged to submit their tax information through the newly introduced SAF-T system. The system was further extended to medium enterprises (from 2023) and from 2025 will also be introduced for small companies. Fast estimates point to the decrease in the VAT compliance gap in 2022 by ca. 1.5 pp. However, the impact of the introduction will likely not be visible until a later date when the estimates of compliance for the subsequent years are available.

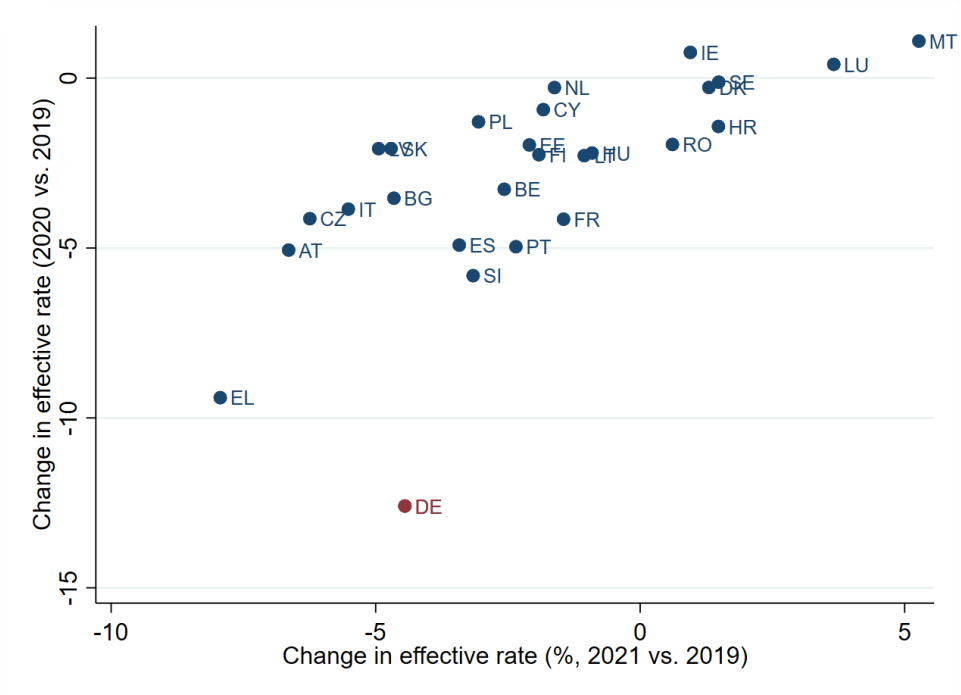
III.e. Germany – case study of temporary reduction of VAT burden and VAT compliance

In response to the economic strain caused by the COVID-19 pandemic, Germany implemented tax relief measures known as the Corona Tax Assistance Act (*Corona-Steuerhilfegesetz*). The key element of these legislative changes was the reduction of statutory VAT rates. The standard VAT rate was decreased from 19 percent to 16 percent, whereas the reduced rate decreased from 7 percent to 5 percent for the period between 1 July 2020 and 31 December 2020. Moreover, for a period of one year from 1 July 2020 to 30 June 2021, VAT on food served and consumed in restaurants as well as company-owned canteens and canteens run by entrepreneurs was temporarily

[21] https://www.elibrary.imf.org/view/journals/002/2016/284/article-A001-en.xml

subject to the reduced rate. As a result, next to Greece, which considerably amended its rate matrix, Germany was one of the two Member States with the largest decline in the VAT burden in 2020 and 2021 (see Figure 18). Compared to 2019, the effective VAT rate fell by 12.6 percent in 2020 and 4.4 percent in 2021.

Figure 18: Changes in VAT effective rate across EU Member States (2021 and 2020)



Source: own elaboration.

As shown by earlier analyses, the impact of the VAT burden on VAT compliance and its measurement is not straightforward. According to EC/CASE (2020) and earlier studies presenting the econometric analysis of VAT compliance gap determinants, VAT burden, proxied as statutory and effective rates, appears not to be statistically significant despite controlling for potential difficulties in the measurement process. One of those difficulties is endogeneity. More specifically – reverse causality and the correlation of VAT rates with other factors that may impact VAT compliance. Importantly, VAT rates tend to be set higher in countries with effective tax collection mechanisms. Moreover, VAT rates tend to remain stable and thus the evidence on the impact of radical changes in the VAT burden on VAT compliance is relatively scarce.

Since VAT compliance in Germany remained stable for many years and changes in the VAT burden in the aftermath of the COVID-19 pandemic were rather exceptional, changes in VAT compliance gap in Germany in recent years could shed some more light on the inter-relation between VAT burden and VAT compliance. To account for the specificity of the period, we look at the changes in Germany compared to the changes observed in other Member States.

A look at the changes in 2020 over 2019 supports this presumption. Compared to other Members State that did not opt for such a far-reaching tax-relief measure in 2020, the increase in the VAT compliance gap in Germany was significantly higher than in most other Member States (an increase of 3.8 percent) (see Figure 19(a)). In 2021, when the VAT burden partially returned to the pre-

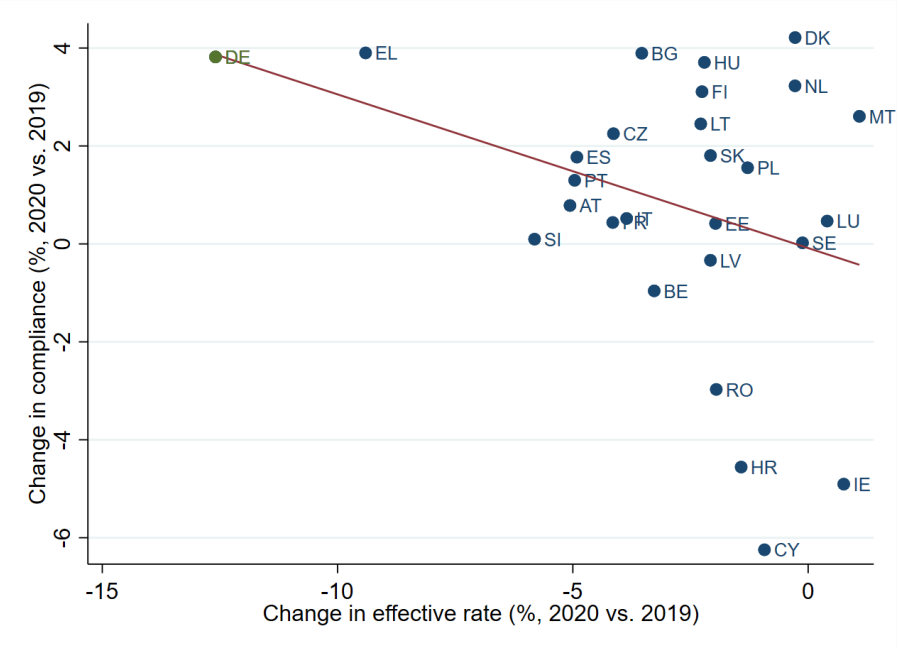
pandemic level, the improvement of VAT compliance did not distinguish Germany from other Member States (see Figure 19(b)).

The development of compliance in Germany confirms the trends observed for all Member States in this period. The relation between VAT compliance and the VAT burden appears to be negative. A reduction in the effective VAT rate by 1 percent between 2020 and 2019 led on average to a ca. 0.3 percent increase in compliance. Similarly, a reduction in the burden by 1 percent between 2021 and 2019, led to a ca. 0.7 percent increase in compliance on average.

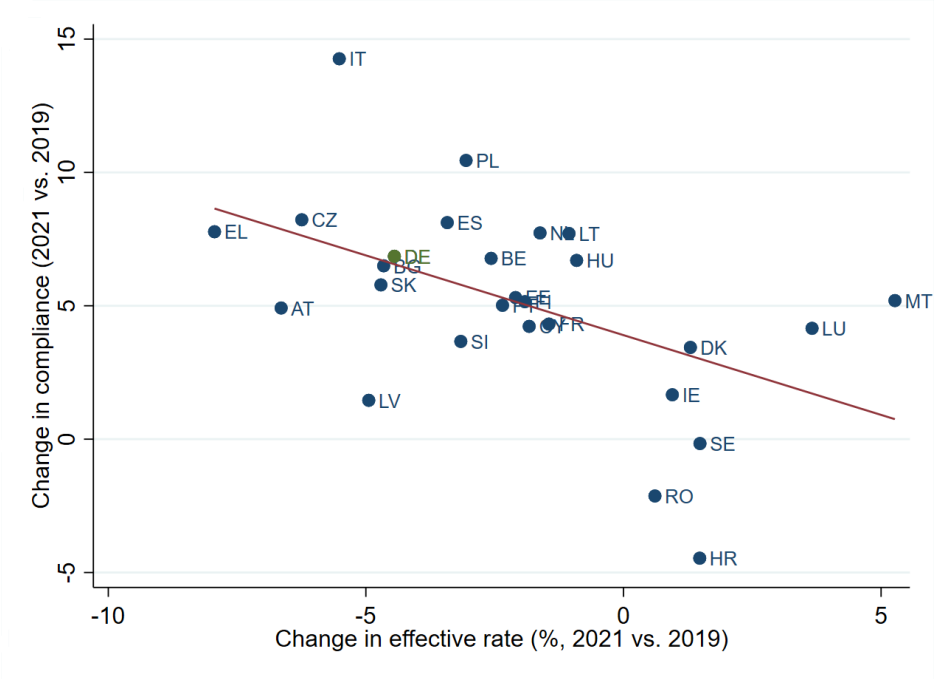
Although the analysis presented in this section has clear limitations as it does not allow to control for other factors that led to changes in VAT compliance in Germany and other countries, it provides some indications. The reduction of the VAT burden in a period of economic strain may have had a positive impact on compliance, which could partially have alleviated forgone revenue from the introduced tax incentives.

Figure 19: Changes in VAT effective rate vs. change in compliance

(a) 2020 vs. 2019



(b) 2021 vs. 2019



Source: own elaboration.

III.f. VAT compliance and the tourism industry

Undisputedly, the COVID-19 pandemic strongly affected virtually all sectors of economic activity in the EU. Yet, the economic consequences of the lockdown were particularly strong for the hospitality and tourism industries. As shown in EC/CASE (2022), on average the decreases in the VAT compliance gaps were more pronounced in Member States with a large contribution of these sectors to GDP. The VAT compliance gap in the 13 Member States with over a 2 percent contribution of tourism to GDP dropped on average by ca. 1.6 pp in 2020, whereas the gaps in other Member States dropped on average by ca. 1.2 pp. This may signal that the hospitality sector is prone to larger non-compliance than other industries. Thus, the decrease in the value of services provided decreased the average non-compliance and the relative VAT compliance gap. The observed pattern may also show that the support measures for the companies in the hospitality and related sectors, which were often contingent on paying taxes, incentivised those companies with their VAT obligations.

This section complements the earlier analysis and looks at the VAT compliance gap in the six Member States with the largest contribution of the hospitality (NACE I55-56) and tourism sectors (NACE N79) to GDP and the largest drop in this contribution after the outbreak of the pandemic. These Member States are Greece, Spain, Croatia, Cyprus, Malta, and Portugal. In all of them, the industries in question accounted for over 3 percent of GDP in 2019. Moreover, these contributions dropped by over 1.5 pp in all these Member States. As a result, the VAT base in these Member States dropped more significantly than elsewhere in the EU. The drop of the VAT base (in nominal terms) ranged from -6.9 percent in Cyprus to -12.4 percent in Malta (see Figure 88(a)).

As shown by Figure 88(b), the shifts in the estimated compliance gap in 2020 for tourist destination Member States were relatively large. In other words, the contribution of the tourism industry to GDP appeared to be strongly correlated with the absolute magnitude of the change in the

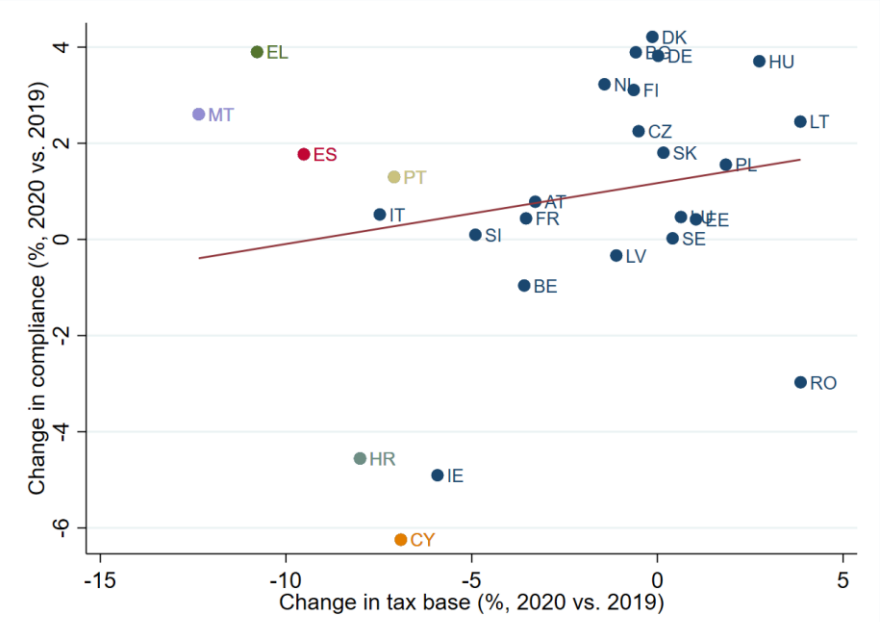
VAT compliance gap in 2020. On the one hand, in Greece and Malta, the estimated compliance gaps strongly decreased (by 3 pp and 1.8 pp, respectively). On the other, in Cyprus and Croatia, the gaps markedly increased (by 5.5 pp and 4.5 pp, respectively).

Both the tourist destination Member Stares where the VAT compliance gap increased and those where the compliance markedly improved implemented relatively generous support measures improving liquidity in the hospitality and tourism sectors. In Greece, the government temporarily reduced the VAT rate for a number of goods and services from 24 percent to 13 percent including hospitality, tourism, and entertainment services. Similarly, Cyprus cut the rate on accommodation, restaurant, and catering services from 9 percent to 5 percent. Companies affected strongly by the pandemic were allowed to defer their VAT payments in Cyprus, Greece, and Malta. Croatia allowed for import VAT deferrals.

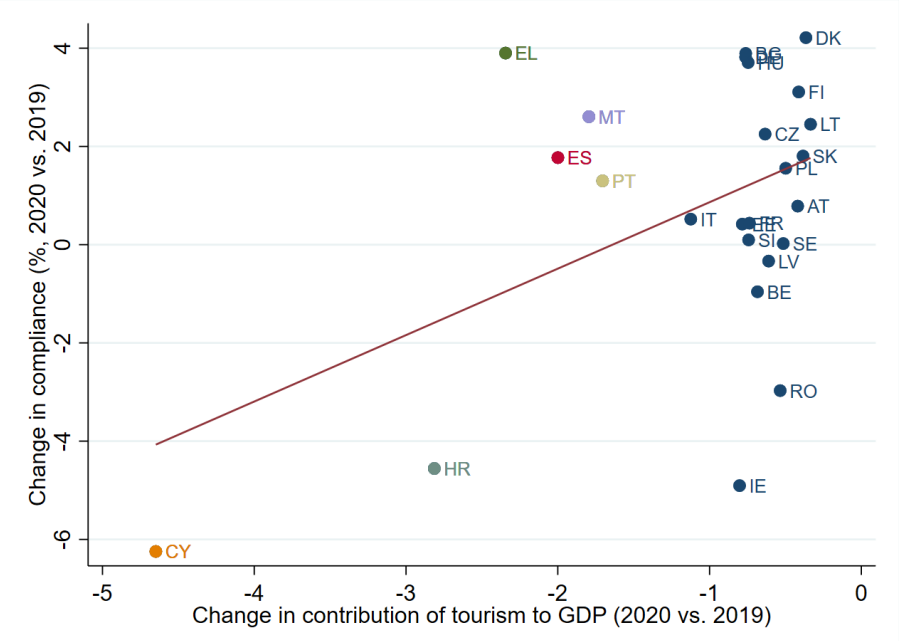
The evolution of the VAT compliance gaps in 2021 shows that the improvement of VAT compliance in Greece, Spain, Malta, and Portugal was rather stable. In Cyprus, the shift of the gap had a rather one-off character whereas in Croatia the gap in the 2019-2021 period was stable. Different time properties of the shifts and the varying direction of these does not allow to draw clear-cut takeaways on the relation between the size of the tourism and hospitality industries and the VAT compliance gap. It may, however, point to some inaccuracies of the estimated shifts in the VAT compliance gap during the period of large-scale deferrals and problems related to the compilation of national accounts (see Section VII.b).

Figure 20: Tax base, tourism industry vs. compliance

(a) Tax base vs. compliance



(b) Tourism industry vs. compliance



Source: own elaboration.

IV. VAT policy gap in the EU

For the EU-27 overall, the average VAT policy gap level in 2021 was approximately 44.9 percent of the notional ideal revenue, which is a slight, 0.3 pp, decline from the value recorded in 2020. As shown by Figure 23, this was driven by the decline in the relative value of imputed rents and from the reduction of the rate gap. The latter is clearly a consequence of the termination of the temporary reassignment of VAT rates for services provided by the industries heavily affected by the pandemic. At the same time, the public services gap further increased, which indicates an incline in expenses on public services, mostly medical treatment. In nominal terms, the policy gap in 2021 amounted to EUR 1 127 billion, which, due to an incline in the overall tax base largely driven by price inflation, was approximately EUR 77 billion higher than in 2020 (see Figure 22).

Of the average value of 44.9 percent, in 2021, approximately 10.4 percent can be attributed to the application of various reduced and super reduced rates (see Table 5). The VAT exemption gap, interpreted as the share of notional ideal revenue forgone due to various exemptions or maintaining some components of household final consumption outside the VAT base, was on average 34.5 percent in 2021. The largest part of the exemption gap is composed of exemptions on services that cannot be taxed in principle, i.e., the provision of public goods and imputed rents (19.8 percent and 8 percent, respectively). The remaining amount of the exemption gap is financial services (1.4 percent) and the actionable exemption gap, which is 5.3 percent, on average.

The actionable policy gap – a combination of the rate gap and the actionable exemption gap – was markedly lower than the sum of the non-actionable components. In 2021, it was 15.7 percent on average, which accounted for approximately 35 percent of the overall policy gap. The combined reduction of theoretical revenue due to reduced rates and exemptions which could not possibly be removed was slightly above 28 percent of the VTTL.

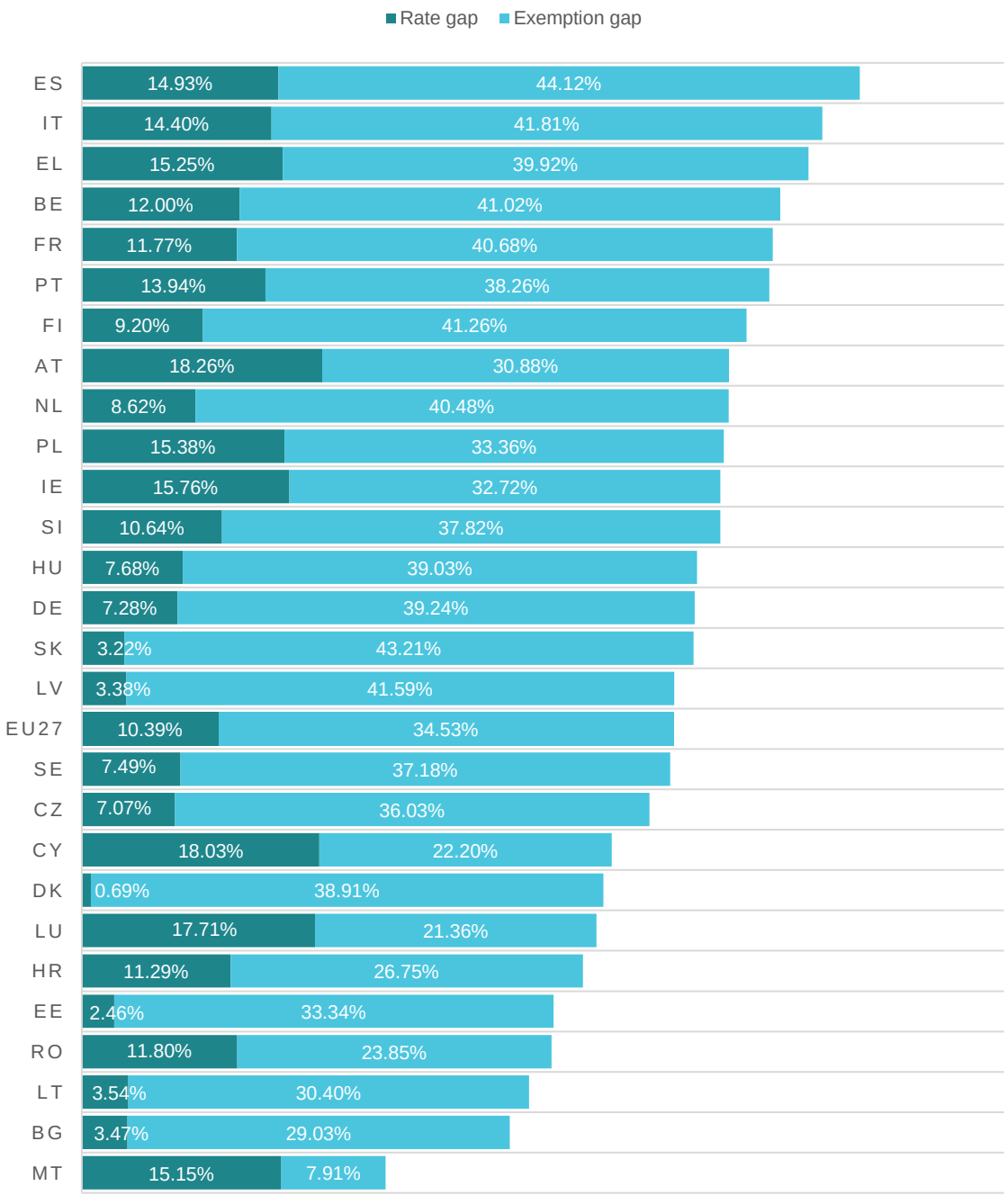
The Member States with the highest value of the policy gap in 2021 are Spain (59.0 percent), Italy (56.2 percent), and Greece (55.2 percent). The actionable policy gap was the highest in Greece (26.7 percent), Spain (26.7 percent), and Poland (26.1 percent). The relatively large overall and actionable

policy gap in Spain is due to the application of other than VAT indirect taxes in the Canary Islands, Ceuta, and Melilla. In practice, forgone tax revenue in VAT is partially compensated by the local consumption taxes applicable in these regimes.

The lowest policy gaps, substantially lower than the EU average, were recorded for Malta (23.1 percent) and Bulgaria (32.5 percent). The very low policy gap in Malta is driven by the exemption gap and its component, the actionable exemption gap. Negative actionable exemption gap was caused by the large role of the gambling sectors providing their electronic services abroad, and no right to deduct input VAT by these providers. As a result, large sums of hidden tax increase overall VAT revenue compared to the scenario assuming the taxability of output and the deductibility of intermediate inputs. Consequently, the actionable policy gap in Malta is approximately 0. Similar to the negative exemption gap attributed to gambling services in Malta, a highly negative exemption gap was recorded for financial and insurance services in Luxembourg. This is related to the relatively large value of these services and the fact that they are used primarily as intermediate inputs or are exported. In the counterfactual scenario assuming that these services were taxed, the financial and insurance services sector would be able to deduct input VAT, which would contribute to the decrease of VAT revenue. At the same time, there would be no gains from output VAT for services provided domestically as VAT would be deducted downstream.

C-efficiency, which can be treated as a proxy of both the policy and compliance gap, amounted to 58.1 percent of net final consumption on average. A C-efficiency above 70 percent was estimated for two Member States, Luxembourg (79 percent) and Estonia (75.8 percent). The high efficiency of VAT collection in both of these Member States is a combined effect of having some of the lowest policy and compliance gaps in the EU. A C-efficiency visibly below 50 percent was estimated for three Member States, Greece (40 percent), Italy (43.5 percent), and Spain (45 percent).

Figure 21: VAT policy gap (as % of notional ideal revenue, 2021)



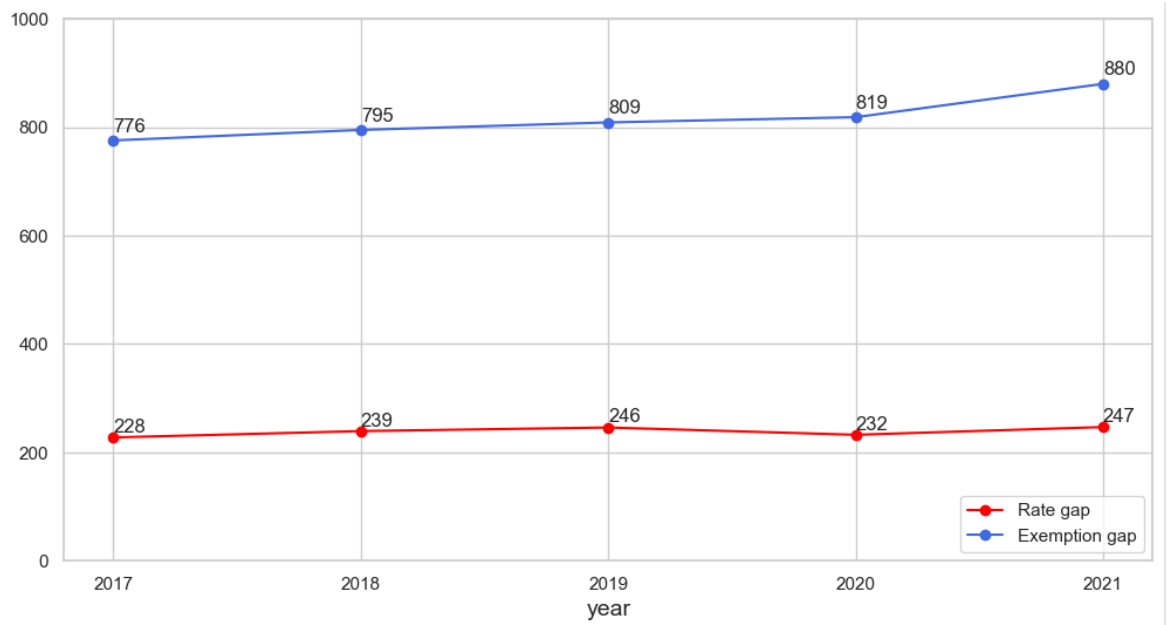
Source: own calculations, download underlying data.

Table 5: Policy gap, rate gap, exemption gap, and actionable gaps (2021)

	A	B	C	D	E	F	G	H	I
MS	**Policy gap (%)**	**Rate gap (%)**	**Exemption gap (%)**	**o/w imputed rents (%)**	**o/w public services (%)**	**o/w financial services (%)**	**Actionable exemption gap (C - D - E - F) (%)**	**Actionable policy gap (G + B) (%)**	**C-efficiency (%)**
BE	53.02	12.00	41.02	7.44	26.57	3.39	3.62	15.63	49.93
BG	32.50	3.47	29.03	8.99	17.32	1.43	1.28	4.75	69.60
CZ	43.10	7.07	36.03	8.85	19.29	2.04	5.85	12.92	61.08
DK	39.60	0.69	38.91	7.47	24.29	4.50	2.65	3.34	65.71
DE	46.52	7.28	39.24	6.77	22.92	2.43	7.11	14.39	59.60
EE	35.80	2.46	33.34	7.40	15.70	2.44	7.80	10.26	75.80
IE	48.48	15.76	32.72	13.63	19.75	-0.45	-0.20	15.55	53.45
EL	55.17	15.25	39.92	8.90	17.07	2.47	11.48	26.73	39.88
ES	59.05	14.93	44.12	9.53	19.74	3.10	11.75	26.68	44.98
FR	52.46	11.77	40.68	9.28	22.66	2.69	6.04	17.82	52.52
HR	38.04	11.29	26.75	6.25	14.62	1.94	3.94	15.23	64.89
IT	56.21	14.40	41.81	10.88	18.78	1.25	10.91	25.31	43.46
CY	40.22	18.03	22.20	6.82	17.32	-4.62	2.68	20.71	62.95
LV	44.97	3.38	41.59	9.30	19.81	1.71	10.78	14.16	55.95
LT	33.94	3.54	30.40	4.59	17.49	1.61	6.71	10.25	58.96
LU	39.07	17.71	21.36	7.63	26.86	-16.17	3.03	20.75	78.96
HU	46.71	7.68	39.03	9.45	16.95	3.33	9.29	16.97	60.14
MT	23.06	15.15	7.91	5.92	16.20	1.05	-15.26	-0.11	65.07
NL	49.10	8.62	40.48	7.23	26.17	4.87	2.21	10.83	59.91
AT	49.13	18.26	30.88	7.56	20.92	2.55	-0.16	18.10	58.10
PL	48.74	15.38	33.36	3.43	16.35	2.84	10.73	26.11	56.00
PT	52.20	13.94	38.26	8.94	20.01	3.68	5.63	19.57	50.70
RO	35.66	11.80	23.85	7.11	10.16	-0.20	6.79	18.60	49.87
SI	48.46	10.64	37.82	7.33	18.79	2.79	8.91	19.56	57.71
SK	46.43	3.22	43.21	10.35	20.04	2.39	10.44	13.65	52.92
FI	50.47	9.20	41.26	10.60	22.85	3.16	4.66	13.86	59.18
SE	44.66	7.49	37.18	4.63	26.03	3.14	3.39	10.87	60.78
EU27	**44.92**	**10.39**	**34.53**	**8.01**	**19.80**	**1.46**	**5.26**	**15.65**	**58.08**

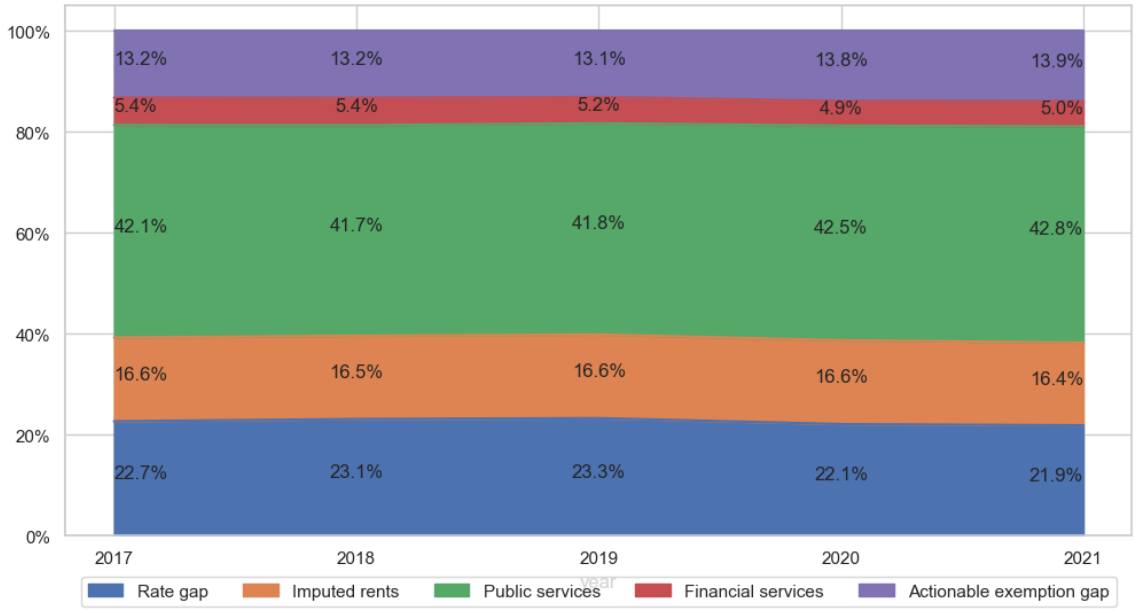
Source: own calculations, download underlying data.

Figure 22: Rate gap and exemption gap (EUR billion, 2017-2021)



Source: own calculations, *download underlying data*.

Figure 23: Decomposition of policy gap into main components (% of policy gap, 2017-2021)



Source: own calculations, *download underlying data*.

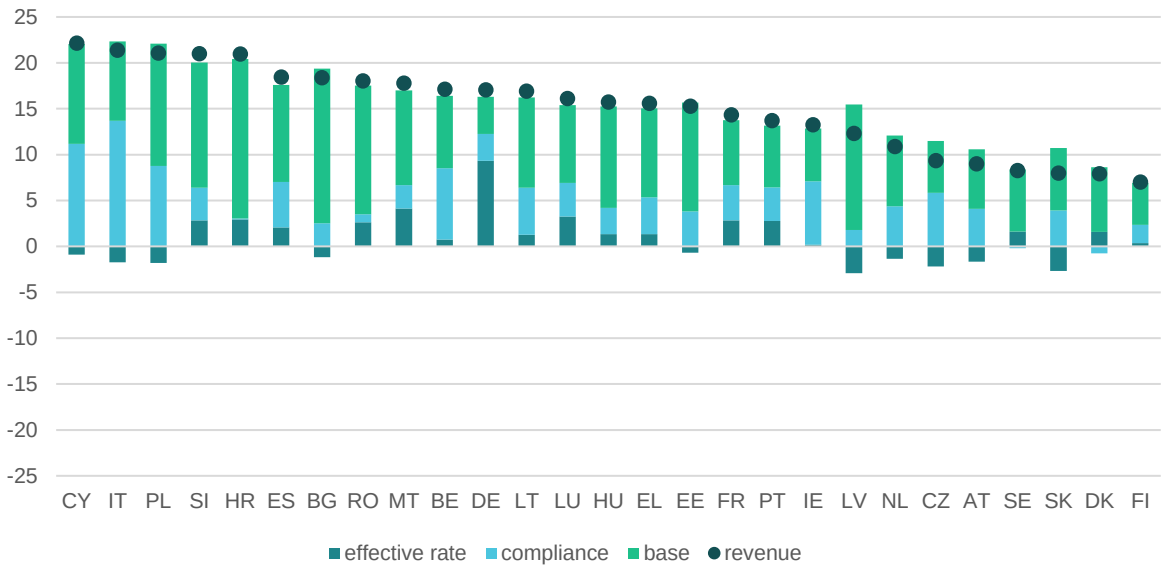
V. Changes in VAT revenue components

Changes in the tax base and effective VAT rate resulted in a high increase in the VTTL in most of the EU Member States.[22] The estimated VTTL increased by 10.2 percent on average. While the tax base increased in each country, the effective VAT rate increased in 17 of them (see Figure 24 and

[22] *See Annex A for the decomposition formula.*

Table 6). A decrease in the effective VAT rate was observed in Bulgaria, Czechia, Estonia, Italy, Cyprus, Latvia, the Netherlands, Austria, Poland, and Slovakia. The differences in effective VAT rate changes are mostly caused by different policies toward the temporary relief measures introduced in response to the COVID-19 pandemic. Some countries, such as Germany, largely abolished these measures at the beginning of 2021 while others kept them in place for longer.

Figure 24: Change in actual VAT revenue components (in %, 2021 vs. 2020)



Source: own calculations, *download underlying data*

Table 6: Change in actual VAT revenue components (in %, 2021 vs. 2020)

Member State	Change in Revenue (%)	Change in the VTTL (%)			Change in Compliance (%)
			Change in Base (%)	Change in Effective Rate (%)	
Belgium	17.2	8.7	7.9	0.7	7.8
Bulgaria	18.4	15.5	16.9	-1.2	2.5
Czechia	9.4	3.3	5.6	-2.2	5.8
Denmark	7.9	8.7	7.1	1.6	-0.7
Germany	17.1	13.7	4.0	9.3	2.9
Estonia	15.3	11.1	11.9	-0.7	3.8
Ireland	13.3	5.9	5.7	0.2	6.9
Greece	15.6	11.1	9.7	1.3	4.0
Spain	18.5	12.9	10.6	2.1	4.9
France	14.4	10.1	7.1	2.8	3.9
Croatia	21.0	20.8	17.4	2.9	0.1
Italy	21.4	6.8	8.7	-1.7	13.7
Cyprus	22.2	9.9	10.9	-0.9	11.2
Latvia	12.3	10.3	13.7	-2.9	1.8
Lithuania	16.9	11.2	9.9	1.3	5.1
Luxembourg	16.1	12.0	8.5	3.2	3.7
Hungary	15.8	12.5	11.0	1.3	2.9
Malta	17.8	14.9	10.3	4.1	2.5
Netherlands	10.9	6.3	7.7	-1.3	4.4
Austria	9.0	4.7	6.5	-1.7	4.1
Poland	21.1	11.3	13.3	-1.8	8.8
Portugal	13.7	9.7	6.8	2.8	3.7
Romania	18.0	17.0	14.0	2.6	0.9
Slovenia	21.0	16.8	13.6	2.8	3.6
Slovakia	8.0	3.9	6.8	-2.7	3.9
Finland	7.0	4.9	4.6	0.4	2.0
Sweden	8.3	8.5	6.8	1.6	-0.2
EU-27 (average)	**15.4**	**10.2**	**7.4**	**2.6**	**4.8**

Source: own calculations, download underlying data.

VI. VAT compliance and policy gaps – individual country results

This section presents the VAT gap estimates for each Member State and discusses the economic and policy developments that might have affected their value and dynamics.[23] Each country chapter also contains highlights enumerating and discussing the main developments in the VAT gaps as well as calculation-related issues. It also presents road signalling which indicates the confidence around the VAT compliance gap estimates (for a more detailed discussion and the classification criteria, see Section VII.c):

- Estimates based on relatively up-to-date information with no or very limited unexplained volatility which could signal inaccuracies.

- Estimates based on somewhat outdated information or relatively large unexplained volatility of estimates.

- Estimates based on some very outdated information or very large unexplained volatility of estimates.

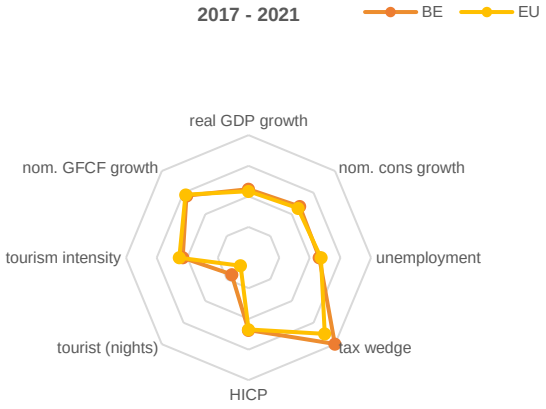
[23] *Source of information: Eurostat (https://ec.europa.eu/eurostat, NAMA_10_GDP, TIPSUN20, EARN_NT_TAXRATE, PRC_HICP_AIND and TOUR_OCC_NINAT) and Our World in Data (https://ourworldindata.org/coronavirus).*

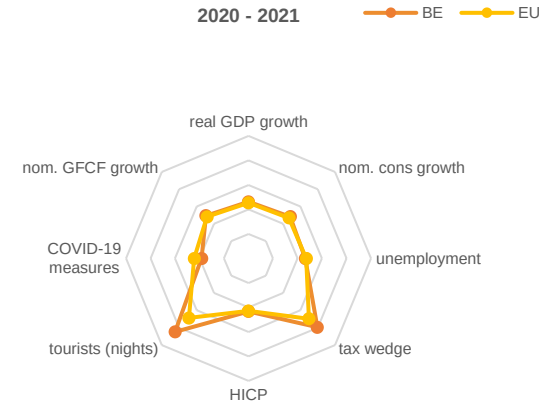
Belgium

Economic and policy context

In 2021, Belgium saw a strong economic recovery with real GDP growth of 6.3 percent. Despite this recovery, however, Belgium also recorded an increase in the unemployment rate (up to 6.3 percent). Similar to other Member States, the economic recovery has followed the recession caused by the COVID-19 pandemic and its containment measures. This increase was also reflected in the very strong rebound in the tourism sector (increase of 44.8 percent in nights spent in hotels and other tourist establishments). However, the relative importance of the hospitality sector is rather modest in Belgium, the sector represented only 1.4% of total added value in 2021. The strong growth of the nominal consumption expenditures of private households and NPISH of 8.2 percent and the robust growth of GFCF (+9.3 percent) also contributed to the strong growth of the VTTL. HICP increased by 3.2 percent, which was above the EU-27 average.

Between 2017 and 2021, the Belgian economy expanded by 4.7 percent, whereas consumer prices went up by 7.4 percent. Real growth was supported by relatively strong development in nominal consumption (+7.3 percent) while the growth of GFCF was relatively weak (17.3 percent). The post-COVID-19 recovery in the tourist sector is relatively strong, while the overall tourism intensity measures as nights spent in hotels and other establishments per inhabitant is clearly below the EU average. Belgium is furthermore characterised by a very high tax wedge of 39.7 percent.





Highlights

- In 2021, the 6 percent reduced VAT rate for the demolition and reconstruction of homes was expanded to cover the entire Belgian territory. In addition, Belgium extended select exemptions from import VAT, for example on health products and equipment related to COVID-19, that were introduced from June 2020 to December 2022.
- In 2021, the estimated size of the VAT compliance gap shrank by 6.7 pp. This significant drop in non-compliance might be linked to the inability to control for late payments from 2020 in 2021, which resulted in somewhat skewed statistics on revenue. Based on preliminary estimates, this volatile behaviour of the VAT compliance gap is expected to stabilise in 2022.
- The policy gap decreased slightly from 53.4 percent in 2020 to 53.0 percent in 2021. Overall, the increase in compliance and the drop of the policy gap led to a large improvement of the collection efficiency measured by an incline in C-efficiency from 45.8 percent to 49.9 percent.

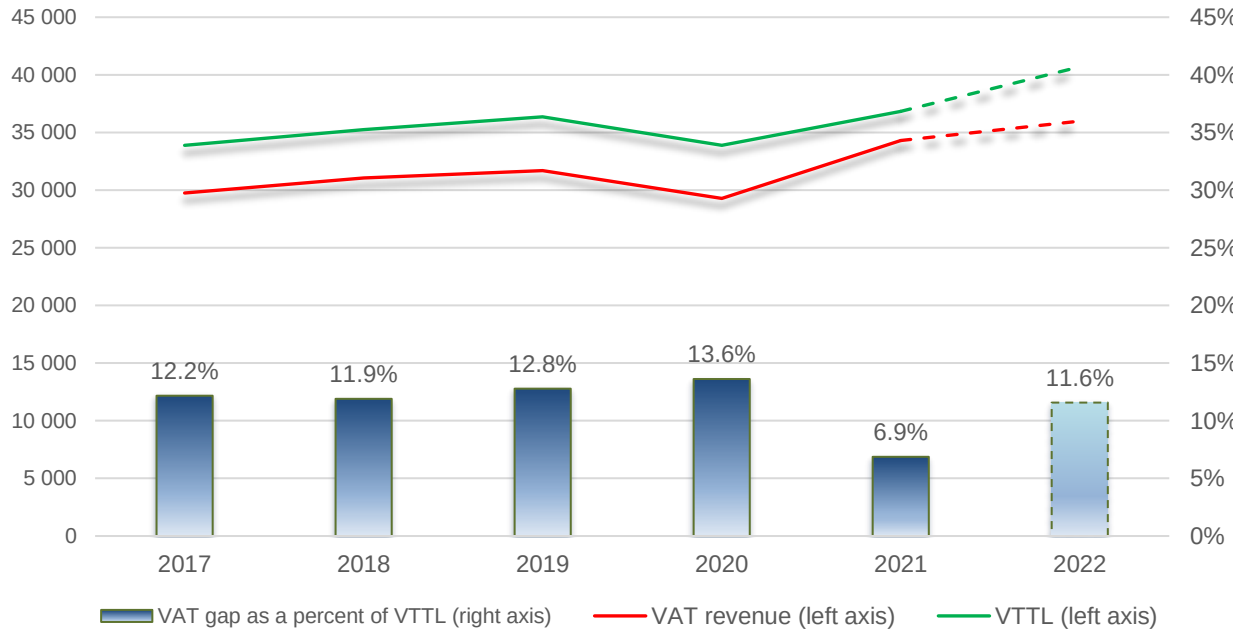
	2017-2021		2020-2021	
Variable	**BE**	**EU**	**BE**	**EU**
GDP (real, % change)	4.7	3.4	6.3	5.4
HH/NPISH cons. (nom)	7.3	5.7	8.2	6.7
Unemployment rate	6.2	7.4	6.3	7.1
Tax wedge	39.7	30.4	39.5	29.7
HICP	7.4	7.0	3.2	2.9
Tourist nights (% change)	-24.4	-32.6	44.8	28.8
Tourist nights (average)	3.0	5.2	-	-
COVID-19 measures (change)	-	-	-1.7	4.3
GFCF (nom, % change)	17.3	18.1	9.3	8.0

Source: Euorstat

Table 7: BE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**33 887**	**35 247**	**36 348**	**33 898**	**36 834**	*40 695*
o/w liability on household final consumption	19 148	19 731	20 208	18 311	19 724	
o/w liability on gov. and NPISH final consumption	1 401	1 472	1 532	1 555	1 688	
o/w liability on intermediate consumption	7 331	7 715	8 105	7 731	8 532	
o/w liability on GFCF	5 319	5 653	5 769	5 683	6 277	
o/w net adjustments	688	676	733	619	613	
VAT revenue	**29 763**	**31 053**	**31 702**	**29 282**	**34 304**	*35 986*
VAT compliance gap	**4 124**	**4 194**	**4 646**	**4 616**	**2 530**	
VAT compliance gap (percent of VTTL)	**12.2%**	**11.9%**	**12.8%**	**13.6%**	**6.9%**	*11.6%*
VAT compliance gap change since 2017					**-5.3 pp**	

Figure 25: BE: VAT compliance gap, VAT revenue, and VTTL[24]



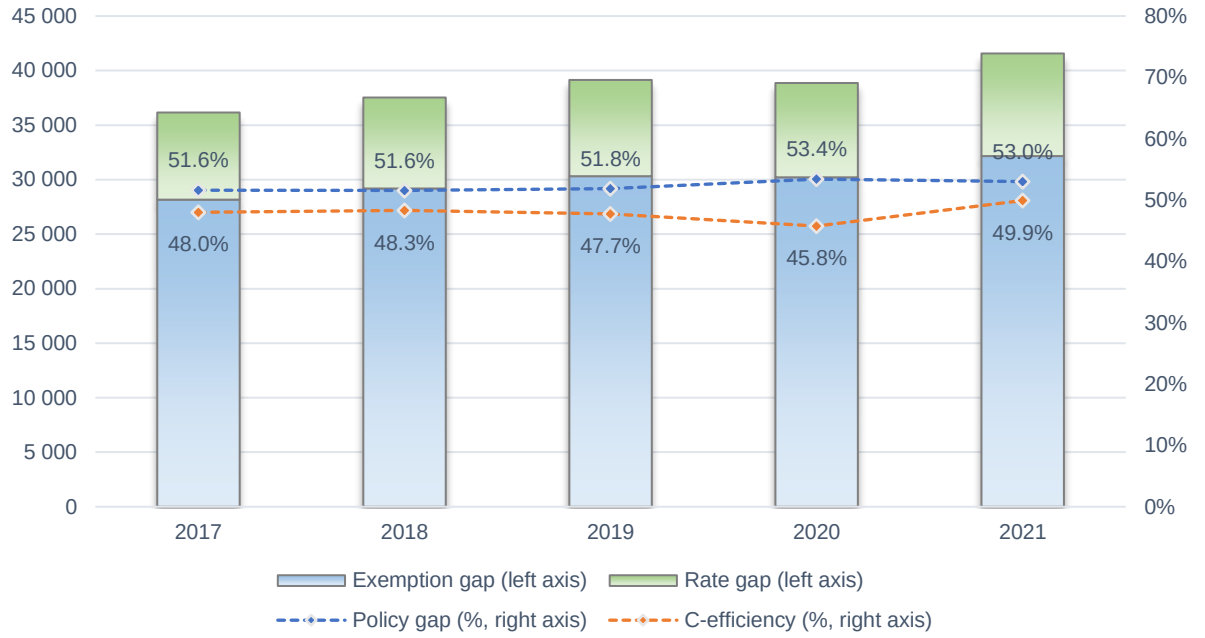
Source: own calculation.

[24] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 8: BE: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**36 154**	**37 530**	**39 140**	**38 858**	**41 569**
Rate gap	7 990	8 343	8 825	8 648	9 410
Exemption gap	28 163	29 187	30 315	30 210	32 159
o/w imputed rents	*5 140*	*5 308*	*5 436*	*5 458*	*5 833*
o/w public services	*17 987*	*18 516*	*19 338*	*19 333*	*20 828*
o/w financial services	*2 714*	*2 870*	*2 762*	*2 445*	*2 656*
Actionable exemption gap	**2 322**	**2 492**	**2 779**	**2 975**	**2 842**
Actionable policy gap	**10 313**	**10 835**	**11 604**	**11 623**	**12 252**
C-efficiency	**47.98%**	**48.30%**	**47.74%**	**45.76%**	**49.93%**

Figure 26: BE: VAT policy gap, rate gap, and exemption gap



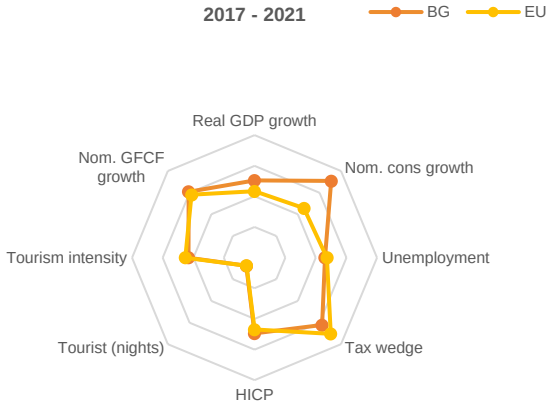
Source: own calculation.

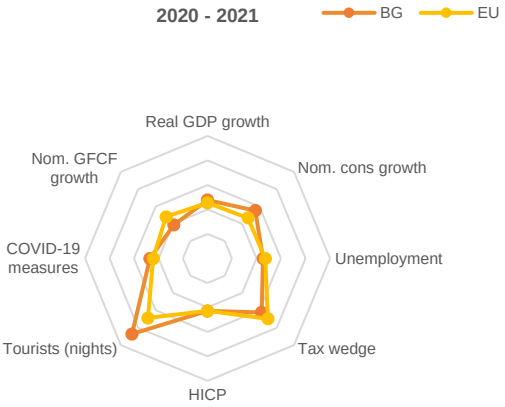
Bulgaria

Economic and policy context

In 2021, Bulgaria recovered from the previous year's contraction at a pace of 7.6 percent. Strong economic tailwinds were reflected in the reduction of the unemployment rate, which reached 5.3 percent in 2021. The COVID-19 measures, still largely in place in 2020, did not hamper the very strong rebound in the tourism sector of 47.2 percent. Despite the strong growth of the nominal consumption expenditures of households and NPISH of 15.3 percent, GFCF declined (-1.1 percent). Inflation, measured as the average change in the HICP, is at 2.9 percent – in line with the average in the EU-27.

In the four-year timeframe between 2017 and 2021, Bulgaria stood out from the EU average with its strong real GDP growth of 10.4 percent and high total inflation of 9.5 percent, both reflecting the convergence process with other EU MS. Real growth was supported by a very strong development of nominal household and NPISH consumption (+30.8 percent), while the growth of GFCF was rather modest (+20.9 percent). The post-COVID-19 recovery in the tourism sector was around the EU average, while the overall tourism intensity is clearly below the EU average.





Highlights

- In 2020, Bulgaria introduced a reduced VAT rate of 9 percent on a diverse array of products and services, including restaurant and catering services, children's books, and sporting facilities. These adjustments remained in effect until the end of 2022, thus the effective VAT rate remained relatively stable.
- In 2021, the VAT compliance gap in Bulgaria fell below 5 percent for the first time since the beginning of the estimations.
- As a consequence of the fast economic recovery, VTTL and revenue in Bulgaria expanded significantly – by 15.5 and 18.4 percent, respectively. This upward trend is expected to continue in 2022.

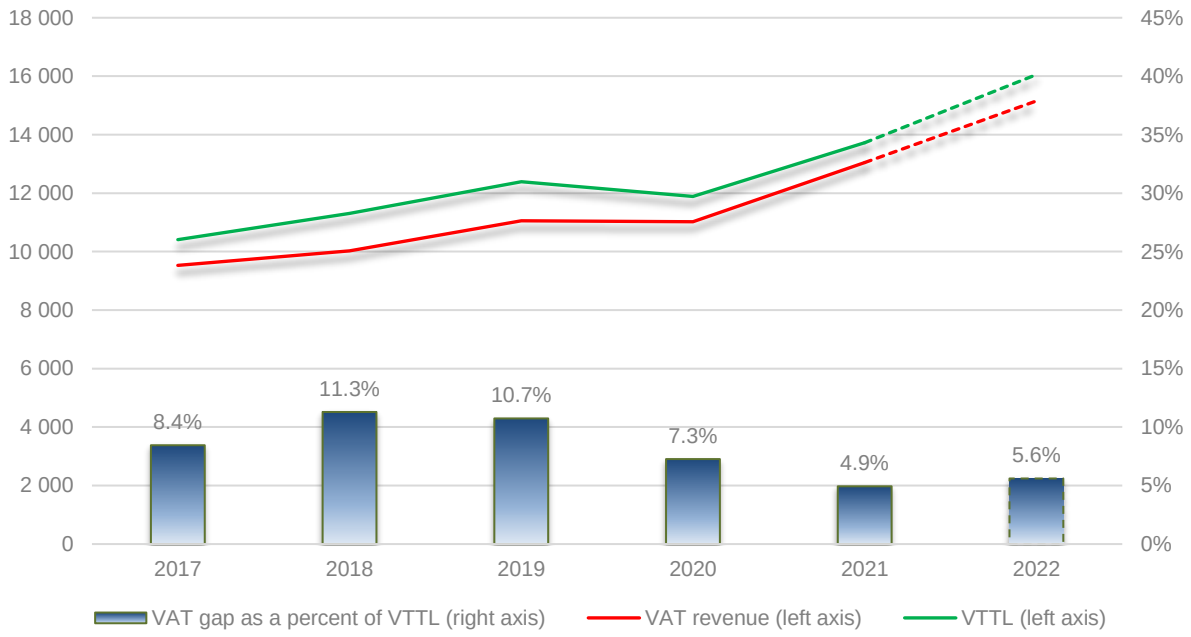
	2017-2021		2020-2021	
Variable	**BG**	**EU**	**BG**	**EU**
GDP (real, % change)	10.4	3.4	7.6	5.4
HH/NPISH cons. (nom)	30.8	5.7	15.3	6.7
Unemployment rate	6.0	7.4	5.3	7.1
Tax wedge	22.3	30.4	22.4	29.7
HICP	9.5	7.0	2.9	2.9
Tourist nights (% change)	-32.4	-32.6	47.2	28.8
Tourist nights (average)	3.1	5.2	-	-
COVID-19 measures (change)	-	-	7.1	4.3
GFCF (nom, % change)	20.9	18.1	-1.1	8.0

Source: Euorstat

Table 9: BG: VAT compliance gaps, VAT receipts, composition of VTTL (BGN million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**10 410**	**11 307**	**12 392**	**11 884**	**13 726**	*16 054*
o/w liability on household final consumption	7 796	8 257	8 880	8 363	9 766	
o/w liability on gov. and NPISH final consumption	298	341	383	450	530	
o/w liability on intermediate consumption	1 261	1 430	1 528	1 450	1 660	
o/w liability on GFCF	1 041	1 254	1 584	1 571	1 715	
o/w net adjustments	14	25	17	50	55	
VAT revenue	**9 531**	**10 030**	**11 061**	**11 021**	**13 048**	*15 154*
VAT compliance gap	**880**	**1 277**	**1 331**	**864**	**678**	
VAT compliance gap (percent of VTTL)	**8.4%**	**11.3%**	**10.7%**	**7.3%**	**4.9%**	*5.6%*
VAT compliance gap change since 2017					**-3.5 pp**	

Figure 27: BG: VAT compliance gap, VAT revenue, and VTTL[25]



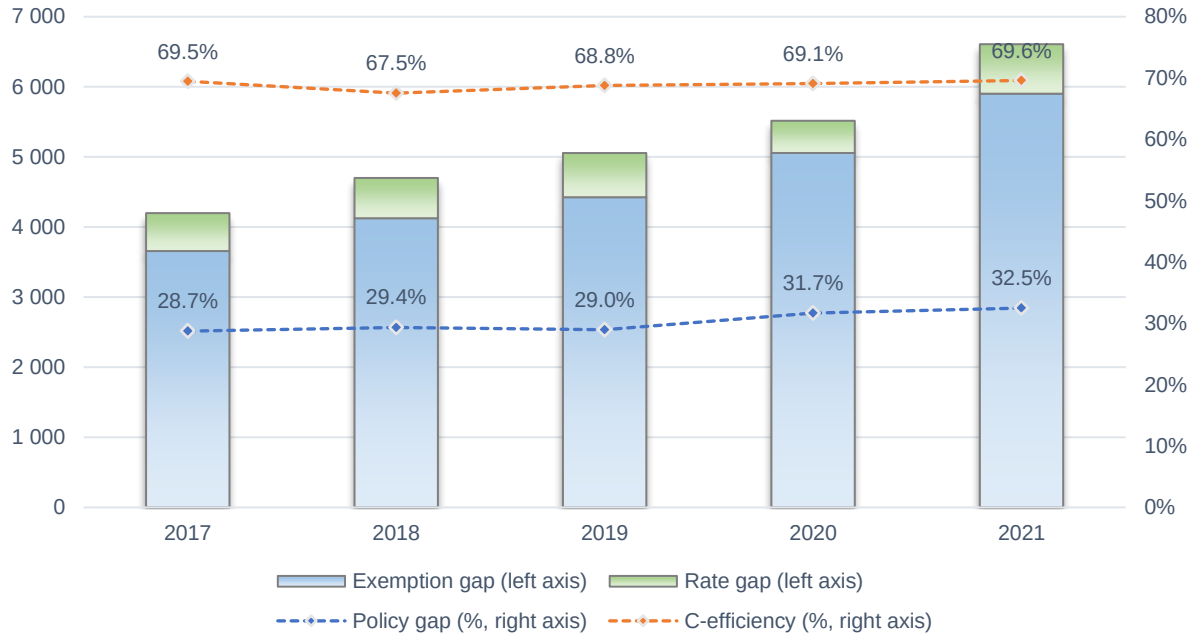
Source: own calculation, download underlying data.

[25] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 10: BG: VAT policy gap and its components (BGN million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**4 199**	**4 700**	**5 056**	**5 516**	**6 608**
Rate gap	541	575	630	460	706
Exemption gap	3 657	4 125	4 425	5 056	5 902
o/w imputed rents	*1 474*	*1 597*	*1 715*	*1 647*	*1 828*
o/w public services	*2 083*	*2 260*	*2 398*	*2 884*	*3 522*
o/w financial services	*294*	*282*	*291*	*254*	*291*
Actionable exemption gap	**- 194**	**- 15**	**22**	**271**	**261**
Actionable policy gap	**347**	**560**	**652**	**731**	**967**
C-efficiency	**69.45%**	**67.54%**	**68.77%**	**69.11%**	**69.60%**

Figure 28: BG: VAT policy gap, rate gap, and exemption gap



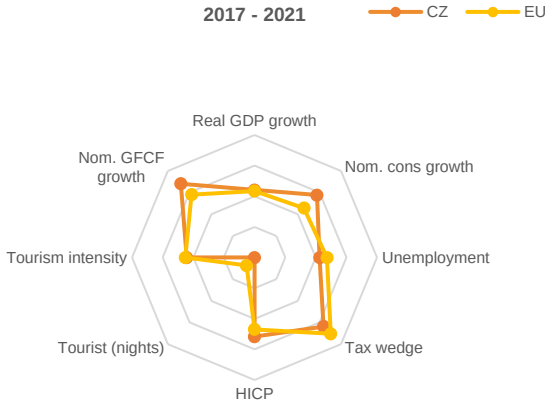
Source: own calculation, download underlying data.

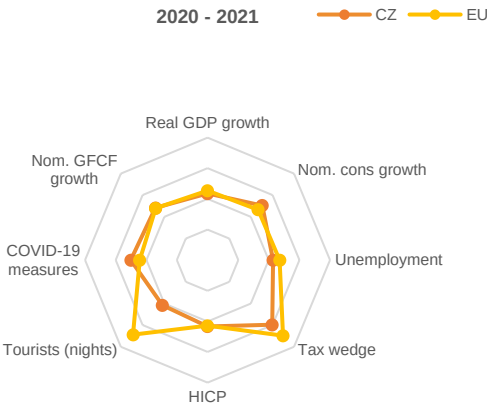
Czechia

Economic and policy context

Czechia saw a relatively weak post-COVID-19 economic recovery with a real GDP growth rate of only 3.6 percent in 2021. As a result, real GDP in 2021 was ca. 2.4 percent below the value recorded for 2019. Despite this subdued recovery, the unemployment rate remained low at only 2.8 percent. And even with the increase in the intensity of the COVID-19 containment measures, the tourism sector recovered slightly (increase in nights spent by tourists of 1.7 percent). Household and NPISH final consumption in nominal terms went sharply up (+10.5 percent). Together with the solid growth of GFCF of 8.2 percent, they all contributed to the large growth of the VTTL. Inflation, measured as the average change in the HICP, was somewhat above the EU average (3.3 percent).

Between 2017 and 2021, Czechia was characterised by a robust GDP growth of 4.1 percent (in real terms) and a comparably high price inflation of 11.6 percent. Nominal household and NPISH consumption increased by 17.6 percent and GFCF went up by 28.1 percent, which led to a large increase in the VTTL. By 2021, the tourism sector had not returned to its size in 2017, which is reflected in the drop in nights spent by tourists in hotel establishments.





Highlights

- In November 2021, VAT on supplies of electricity and gas was temporarily suspended.
- In 2021, the VAT compliance gap in Czechia continued its downward trend reaching 7 percent of the VTTL. This trend is expected to continue into 2022. The stability of this trend from 2019 is also a signal that there was no major issue with recording deferred VAT payments in VAT revenue between 2020 and 2021.
- As a consequence of improved compliance, C-efficiency increased by 2 pp in 2021. At the same time, the policy gap steadily increased over the years – mostly as a consequence of the increased share of expenditure on exempt services.

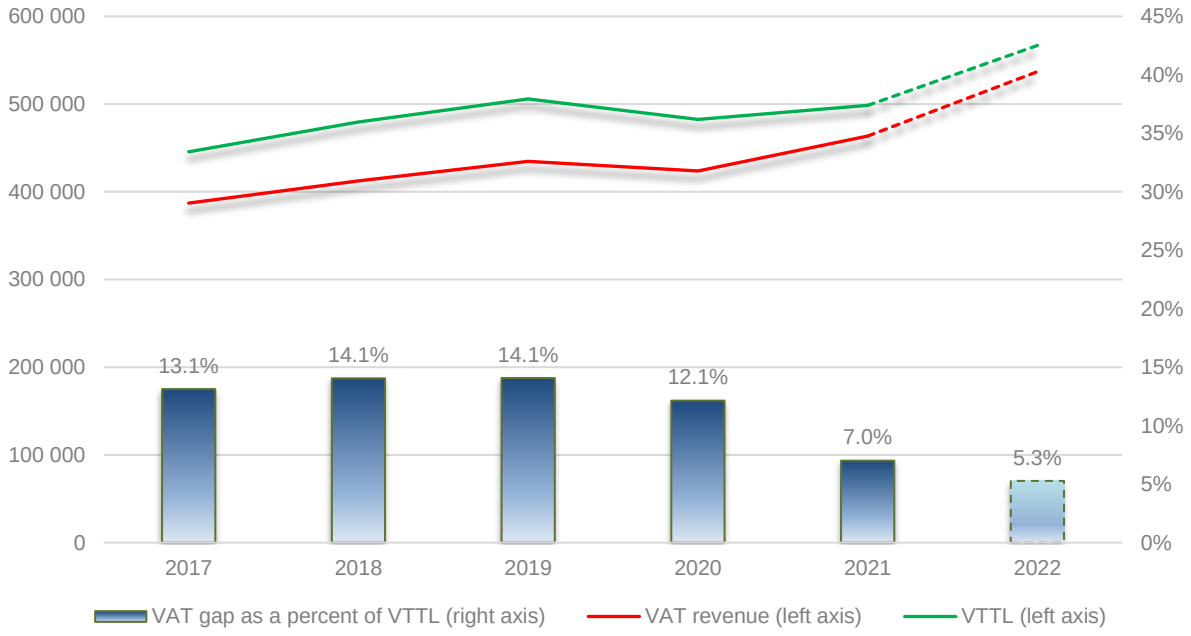
	2017-2021		2020-2021	
Variable	**CZ**	**EU**	**CZ**	**EU**
GDP (real, % change)	4.1	3.4	3.6	5.4
HH/NPISH cons. (nom)	17.6	5.7	10.5	6.7
Unemployment rate	2.5	7.4	2.8	7.1
Tax wedge	23.7	30.4	19.7	29.7
HICP	11.6	7.0	3.3	2.9
Tourist nights (% change)	-40.0	-32.6	1.7	28.8
Tourist nights (average)	4.3	5.2	-	-
COVID-19 measures (change)	-	-	10.1	4.3
GFCF (nom, % change)	28.1	18.1	8.2	8.0

Source: Euorstat

Table 11: CZ: VAT compliance gaps, VAT receipts, composition of VTTL (CZK million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**445 597**	**479 666**	**505 825**	**482 445**	**498 452**	*566 823*
o/w liability on household final consumption	280 660	293 848	304 328	279 104	289 005	
o/w liability on gov. and NPISH final consumption	20 740	22 969	25 006	26 421	26 578	
o/w liability on intermediate consumption	84 390	89 868	95 292	95 504	99 142	
o/w liability on GFCF	59 904	71 452	79 506	80 888	83 807	
o/w net adjustments	- 97	1 529	1 693	528	- 81	
VAT revenue	**387 074**	**412 271**	**434 627**	**423 868**	**463 521**	*536 897*
VAT compliance gap	**58 523**	**67 395**	**71 198**	**58 577**	**34 931**	
VAT compliance gap (percent of VTTL)	**13.1%**	**14.1%**	**14.1%**	**12.1%**	**7.0%**	*5.3%*
VAT compliance gap change since 2017					**-6.1 pp**	

Figure 29: CZ: VAT compliance gap, VAT revenue, and VTTL[26]



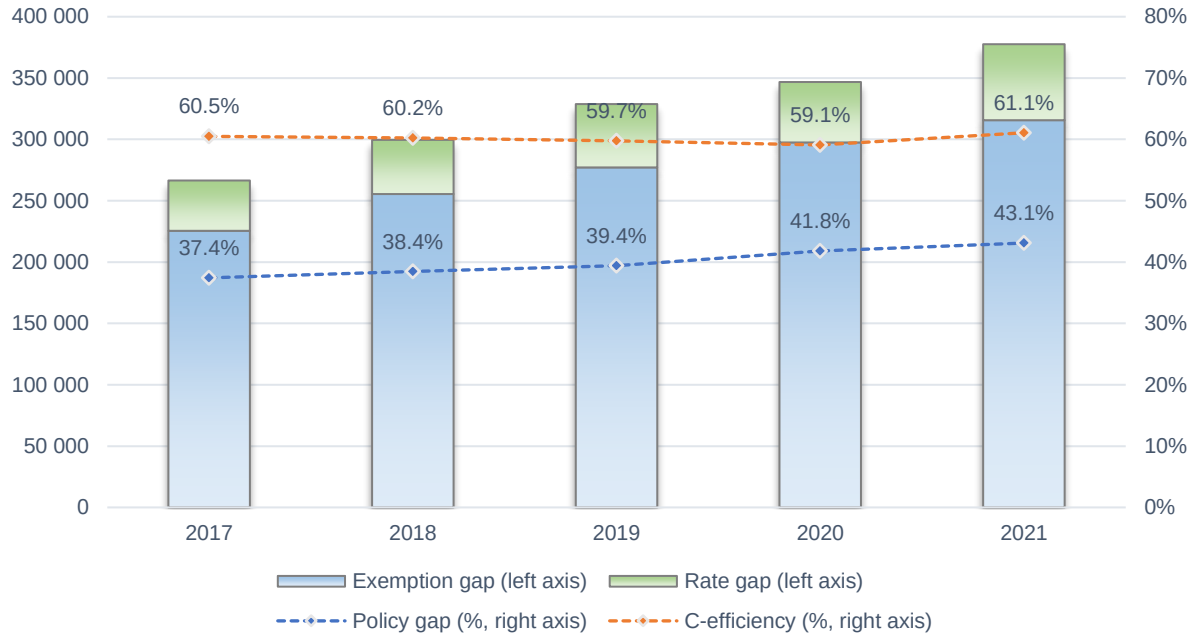
Source: own calculation, download underlying data.

[26] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 12: CZ: VAT policy gap and its components (CZK million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**266 493**	**299 595**	**328 776**	**346 772**	**377 593**
Rate gap	41 006	44 140	51 631	49 257	61 947
Exemption gap	225 487	255 454	277 145	297 515	315 646
o/w imputed rents	*59 790*	*67 248*	*72 378*	*75 473*	*77 528*
o/w public services	*120 302*	*128 440*	*139 415*	*155 333*	*168 947*
o/w financial services	*14 900*	*14 342*	*14 405*	*16 952*	*17 894*
Actionable exemption gap	**30 495**	**45 424**	**50 947**	**49 757**	**51 277**
Actionable policy gap	**71 501**	**89 565**	**102 578**	**99 014**	**113 224**
C-efficiency	**60.49%**	**60.21%**	**59.74%**	**59.09%**	**61.08%**

Figure 30: CZ: VAT policy gap, rate gap, and exemption gap



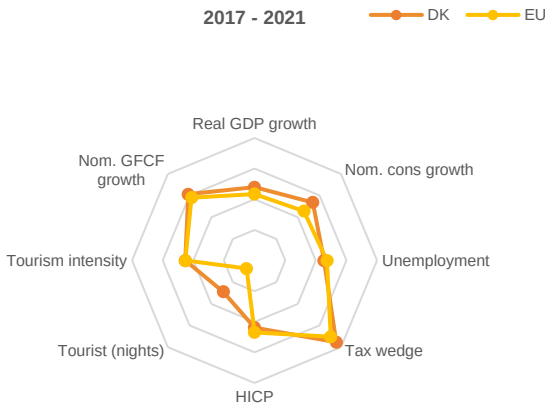
Source: own calculation, download underlying data.

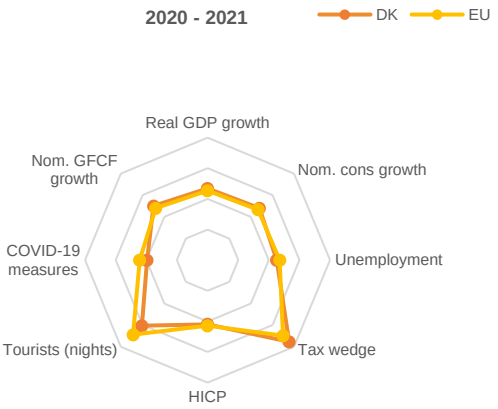
Denmark

Economic and policy context

In 2021, Denmark saw a strong economic recovery, with a real GDP growth rate of 6.8 percent following a relatively mild contraction in 2020. The strong recovery was accompanied by a marked reduction in the unemployment rate (down to 5.1 percent). A moderate reduction in the COVID-19 containment measures brought a solid rebound in the number of nights spent by tourists (+20.6 percent). Additionally, household and NPISH final consumption in Denmark robustly increased (+7.9 percent). Another factor contributing to the growth of the VTTL was GFCF (+9.9 percent). Inflation, measured as the total change in the HICP, was relatively low (1.9 percent).

GDP growth in Denmark since 2017 was substantially steeper than on average in the EU. Real growth was supported by a robust development in household and NPISH consumption (+13.7 percent in nominal terms) and GFCF (+21.2 percent in nominal terms). The post-COVID-19 recovery of the tourism sector was still incomplete (compared to 2017). The tax wedge in Denmark was relatively high at 35.5 percent and substantially above the EU average.





Highlights

- The VAT compliance gap remained relatively stable in the analysed period. In 2020, the VAT compliance gap went down by approximately 3.9 pp and amounted to 5 percent of the VTTL. An important factor supporting liquidity and compliance with VAT obligations was the postponement of VAT payment obligations beyond 2020.
- The VAT compliance gap estimates in Denmark show that non-compliance stabilised at a new level, around 5 percent of the VTTL, with a slight upwards trend.
- The policy gap is among the most stable and the lowest in EU-27 due to the simple system of rates.

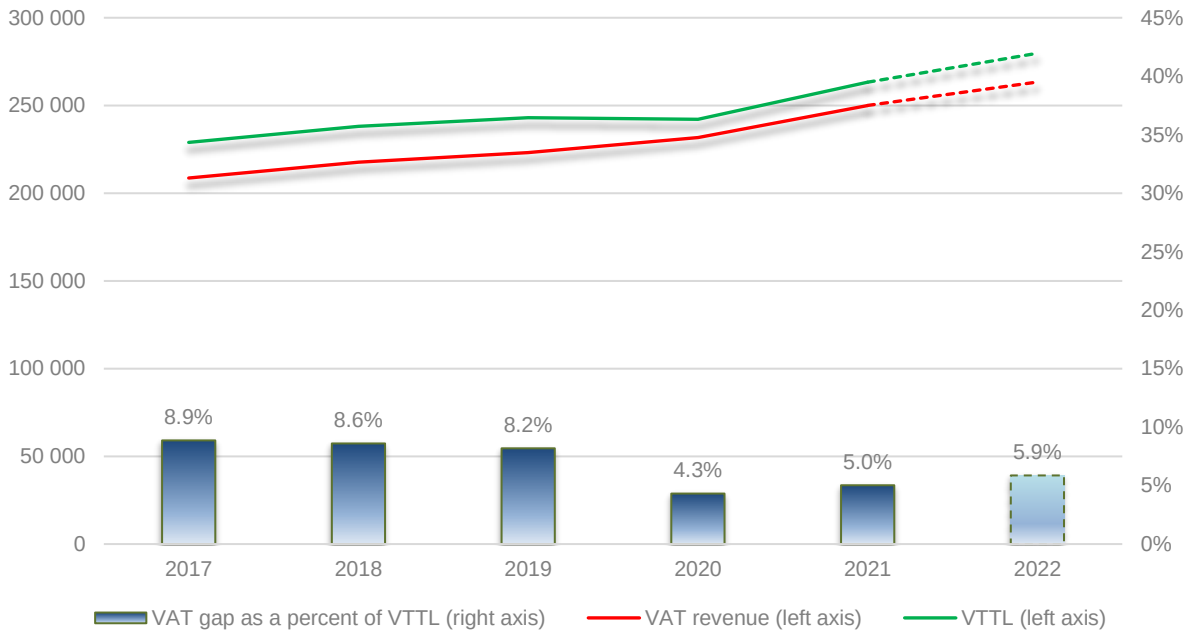
	2017-2021		2020-2021	
Variable	**DK**	**EU**	**DK**	**EU**
GDP (real, % change)	7.9	3.4	6.8	5.4
HH/NPISH cons. (nom)	13.7	5.7	7.9	6.7
Unemployment rate	5.3	7.4	5.1	7.1
Tax wedge	35.5	30.4	35.4	29.7
HICP	3.8	7.0	1.9	2.9
Tourist nights (% change)	-11.2	-32.6	20.6	28.8
Tourist nights (average)	5.2	5.2	-	-
COVID-19 measures (change)	-	-	-0.4	4.3
GFCF (nom, % change)	21.2	18.1	9.9	8.0

Source: Euorstat

Table 13: DK: VAT compliance gaps, VAT receipts, composition of VTTL (DKK million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**228 932**	**238 108**	**243 079**	**242 078**	**263 256**	*279 756*
o/w liability on household final consumption	134 280	140 388	143 367	139 049	150 406	
o/w liability on gov. and NPISH final consumption	5 309	5 301	5 475	5 634	6 057	
o/w liability on intermediate consumption	53 627	55 374	56 935	57 859	63 279	
o/w liability on GFCF	29 939	31 490	31 570	33 324	36 415	
o/w net adjustments	5 776	5 556	5 731	6 212	7 099	
VAT revenue	**208 643**	**217 627**	**223 180**	**231 628**	**250 020**	*263 345*
VAT compliance gap	**20 289**	**20 481**	**19 899**	**10 450**	**13 236**	
VAT compliance gap (percent of VTTL)	**8.9%**	**8.6%**	**8.2%**	**4.3%**	**5.0%**	*5.9%*
VAT compliance gap change since 2017					**-3.8 pp**[27]	

Figure 31: DK: VAT compliance gap, VAT revenue, and VTTL[28]



Source: own calculation, download underlying data.

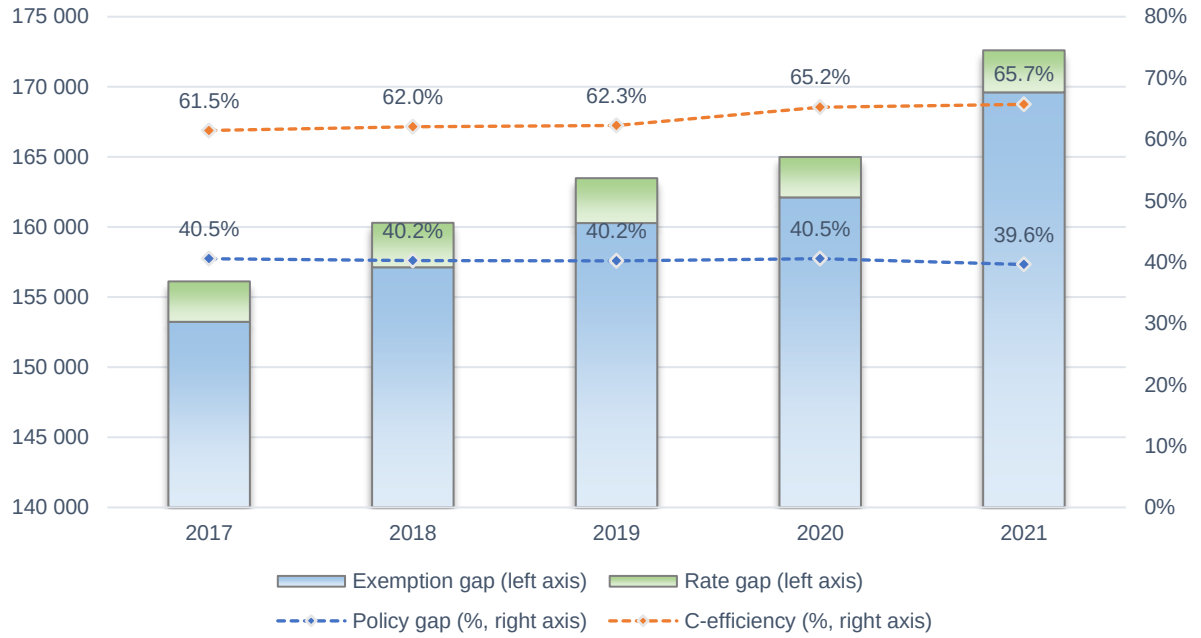
[27] *Numbers do not add up due to rounding.*

[28] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 14: DK: VAT policy gap and its components (DKK million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**156 122**	**160 299**	**163 484**	**164 992**	**172 604**
Rate gap	2 884	3 171	3 203	2 881	3 000
Exemption gap	153 238	157 129	160 281	162 112	169 604
o/w imputed rents	*28 328*	*29 578*	*30 481*	*30 985*	*32 558*
o/w public services	*93 917*	*95 644*	*98 341*	*99 958*	*105 875*
o/w financial services	*18 818*	*18 814*	*18 710*	*18 594*	*19 630*
Actionable exemption gap	**12 175**	**13 093**	**12 749**	**12 575**	**11 540**
Actionable policy gap	**15 059**	**16 264**	**15 952**	**15 455**	**14 540**
C-efficiency	**61.45%**	**62.04%**	**62.26%**	**65.24%**	**65.71%**

Figure 32: DK: VAT policy gap, rate gap, and exemption gap



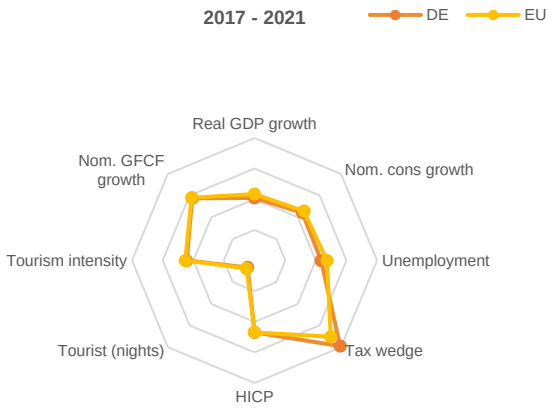
Source: own calculation, download underlying data.

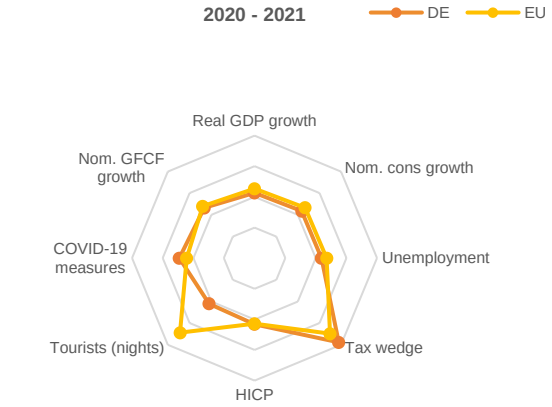
Germany

Economic and policy context

With a real GDP growth rate of 2.6 percent in 2021, the economy of Germany has not yet returned to its 2019 volume. The sizeable increase in the intensity of the COVID-19 restrictions was reflected in the stagnating number of nights spent by tourists (increase of 2 percent year-over-year). Likewise, the growth of nominal consumption of households and NPISH was relatively weak (+3.5 percent). GFCF increased above the inflation level (+6.5 percent). Inflation, measured as the total change in the HICP, was 3.2 percent and slightly above the EU average.

Real GDP growth in Germany between 2017 and 2021 was only 0.9 percent, whereas consumer prices increased by 7 percent. Relatively low real growth was a result of below-average growth on nominal household and NPISH consumption (+4.2 percent) and GFCF (+17.5 percent). The post-COVID-19 recovery in the nights spent by tourists was still incomplete (a reduction of 33.7 percent compared to 2017).





Highlights

- The temporary reduction of VAT rates, implemented in response to the pandemic, expired in December 2020, whereas the targeted rate reduction for restaurant and catering services was extended.
- In nominal terms, the VAT compliance gap in 2021 fell by EUR 5.6 billion, which was the second highest contribution to the overall decrease in the gap in the EU-27.
- After a stable period between 2017 and 2019 where the VAT compliance gap ranged between 9.0 and 9.5 percent of the VTTL, the gap dropped significantly in 2020 to 5.6 percent and further to 2.8 percent in 2021. Fast estimates show that the compliance gap in 2022 remained stable.

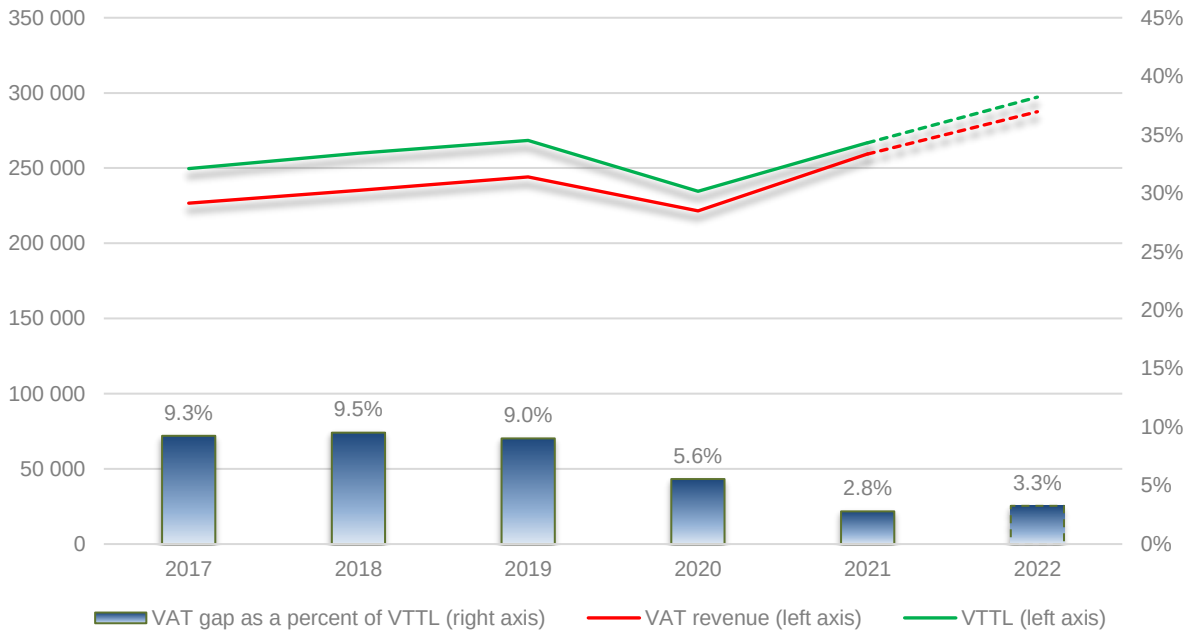
	2017-2021		2020-2021	
Variable	**DE**	**EU**	**DE**	**EU**
GDP (real, % change)	0.9	3.4	2.6	5.4
HH/NPISH cons. (nom)	4.2	5.7	3.5	6.7
Unemployment rate	3.4	7.4	3.7	7.1
Tax wedge	39.0	30.4	37.8	29.7
HICP	7.0	7.0	3.2	2.9
Tourist nights (% change)	-33.7	-32.6	2.0	28.8
Tourist nights (average)	4.3	5.2	-	-
COVID-19 measures (change)	-	-	9.1	4.3
GFCF (nom, % change)	17.5	18.1	6.5	8.0

Source: Euorstat

Table 15: DE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**249 693**	**259 883**	**268 349**	**234 602**	**266 845**	*297 224*
o/w liability on household final consumption	149 768	153 562	157 753	130 630	147 177	
o/w liability on gov. and NPISH final consumption	6 924	7 199	7 648	7 413	8 631	
o/w liability on intermediate consumption	49 274	52 101	54 118	52 241	59 726	
o/w liability on GFCF	41 422	44 735	46 643	42 804	49 347	
o/w net adjustments	2 304	2 285	2 187	1 514	1 965	
VAT revenue	**226 582**	**235 130**	**244 111**	**221 562**	**259 385**	*287 508*
VAT compliance gap	**23 111**	**24 753**	**24 238**	**13 040**	**7 460**	
VAT compliance gap (percent of VTTL)	**9.3%**	**9.5%**	**9.0%**	**5.6%**	**2.8%**	*3.3%*
VAT compliance gap change since 2017					**-6.5 pp**	

Figure 33: DE: VAT compliance gap, VAT revenue, and VTTL[29]



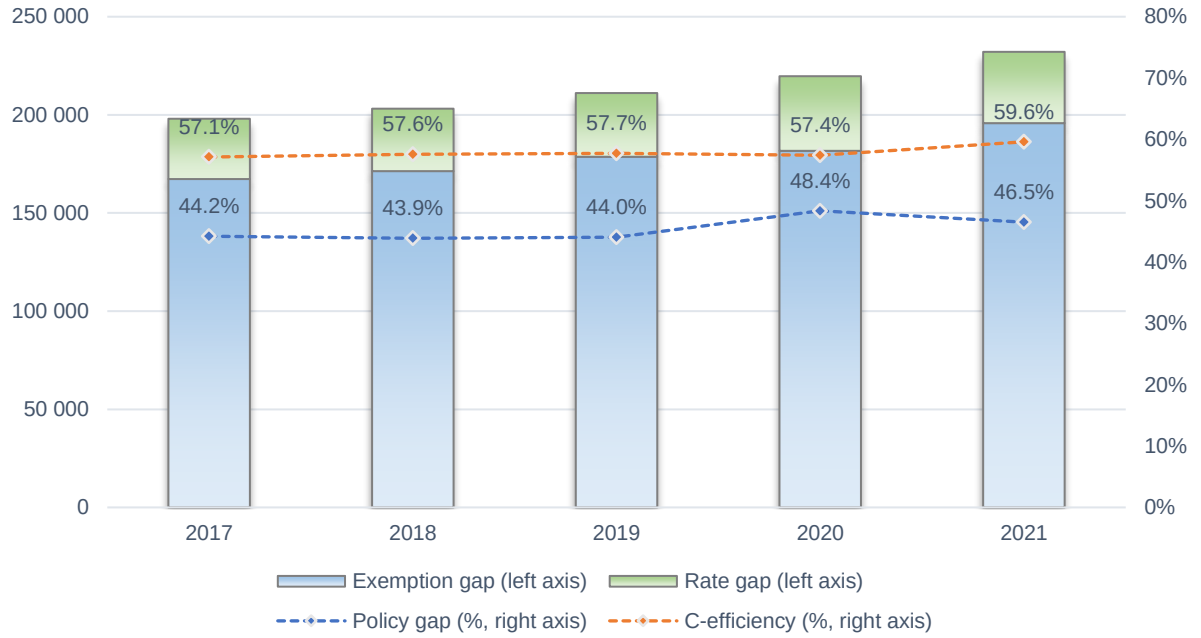
Source: own calculation, download underlying data.

[29] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 16: DE: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**198 019**	**203 151**	**211 101**	**219 697**	**232 098**
Rate gap	30 717	31 817	32 448	38 015	36 319
Exemption gap	167 302	171 334	178 653	181 682	195 778
o/w imputed rents	*30 355*	*31 327*	*32 237*	*31 157*	*33 798*
o/w public services	*97 003*	*99 197*	*104 290*	*101 392*	*114 339*
o/w financial services	*11 691*	*12 234*	*11 661*	*11 068*	*12 145*
Actionable exemption gap	**28 253**	**28 576**	**30 466**	**38 066**	**35 497**
Actionable policy gap	**58 970**	**60 393**	**62 914**	**76 080**	**71 816**
C-efficiency	**57.13%**	**57.58%**	**57.73%**	**57.43%**	**59.60%**

Figure 34: DE: VAT policy gap, rate gap, and exemption gap



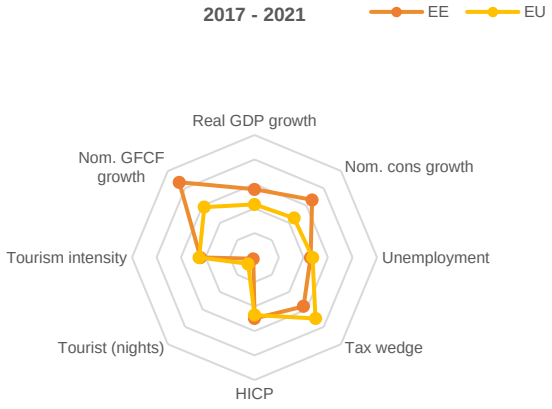
Source: own calculation, download underlying data.

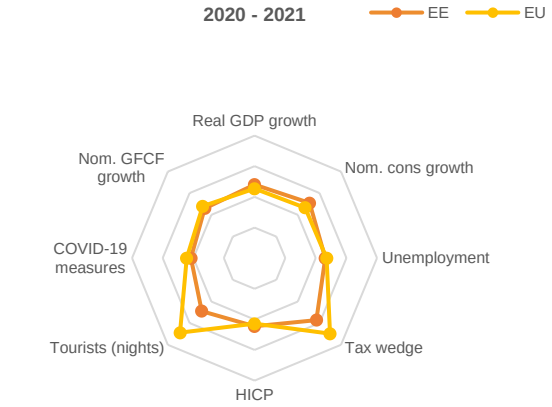
Estonia

Economic and policy context

In 2021, Estonia saw a strong economic recovery. Despite the COVID-19, crisis, GDP increased by over 7 percent since 2019. The economic growth was also reflected in the unemployment rate, which dropped to 6.2 percent. The rebound of the economy was not driven primarily by tourism as demand for tourist services remained low (increase of 8.8 percent in 2021). The growth of the VTTL was driven by both the growth of nominal consumption expenditures of households and NPISH (+10.9 percent) and GFCF (+6 percent). Inflation, measured as the average change in the HICP, is comparably high at 4.5 percent.

In the medium run, Estonia was characterised by a strong and stable GDP growth of 15.7 percent and a high inflation of 9.8 percent. The strong real growth is a result of very large growth in nominal final consumption of households and NPISH (+26.5 percent) and a very strong increase in GFCF (+46.9 percent). The recovery in tourist arrivals is comparably weak with a reduction of 38.6 percent, which was substantially below the EU average.





Highlights

- The Estonian VAT rates system remained stable in 2020 and 2021 – one of the signs of that stability is the level of the policy gap which remained virtually unchanged.
- After a very significant drop by 3.6 pp, the VAT compliance gap in Estonia reached 1.4 percent of VTTL – one of the lowest values in the EU. Based on the fast estimates, a similar gap level was kept through 2022.
- C-efficiency in Estonia in 2021 was the highest in the EU. VAT receipts accounted for almost 75 percent of the theoretical VAT base.

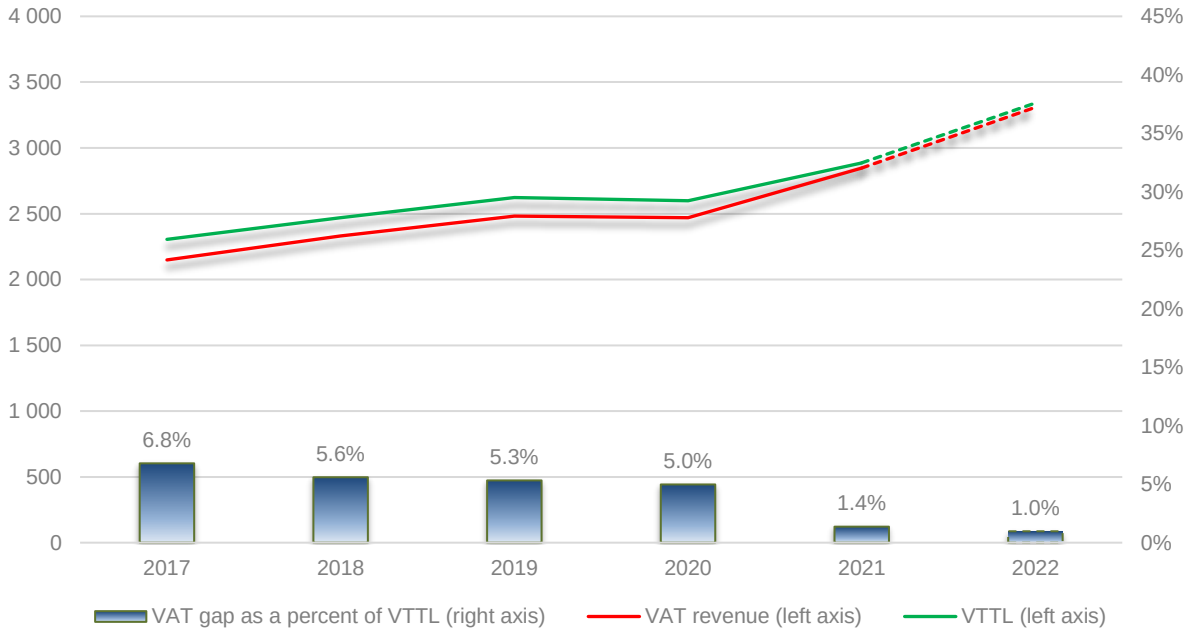
	2017-2021		2020-2021	
Variable	**EE**	**EU**	**EE**	**EU**
GDP (real, % change)	15.7	3.4	8.0	5.4
HH/NPISH cons. (nom)	26.5	5.7	10.9	6.7
Unemployment rate	5.8	7.4	6.2	7.1
Tax wedge	16.4	30.4	17.3	29.7
HICP	9.8	7.0	4.5	2.9
Tourist nights (% change)	-38.6	-32.6	8.8	28.8
Tourist nights (average)	4.2	5.2	-	-
COVID-19 measures (change)	-	-	1.5	4.3
GFCF (nom, % change)	46.9	18.1	6.0	8.0

Source: Euorstat

Table 17: EE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**2 305**	**2 469**	**2 622**	**2 599**	**2 887**	*3 341*
o/w liability on household final consumption	1 525	1 628	1 715	1 648	1 832	
o/w liability on gov. and NPISH final consumption	68	76	86	91	100	
o/w liability on intermediate consumption	319	342	378	365	411	
o/w liability on GFCF	381	420	440	491	538	
o/w net adjustments	12	3	4	4	5	
VAT revenue	**2 149**	**2 331**	**2 483**	**2 469**	**2 847**	*3 309*
VAT compliance gap	**156**	**138**	**140**	**129**	**40**	
VAT compliance gap (percent of VTTL)	**6.8%**	**5.6%**	**5.3%**	**5.0%**	**1.4%**	*1.0%*
VAT compliance gap change since 2017					**-5.4 pp**	

Figure 35: EE: VAT compliance gap, VAT revenue, and VTTL[30]



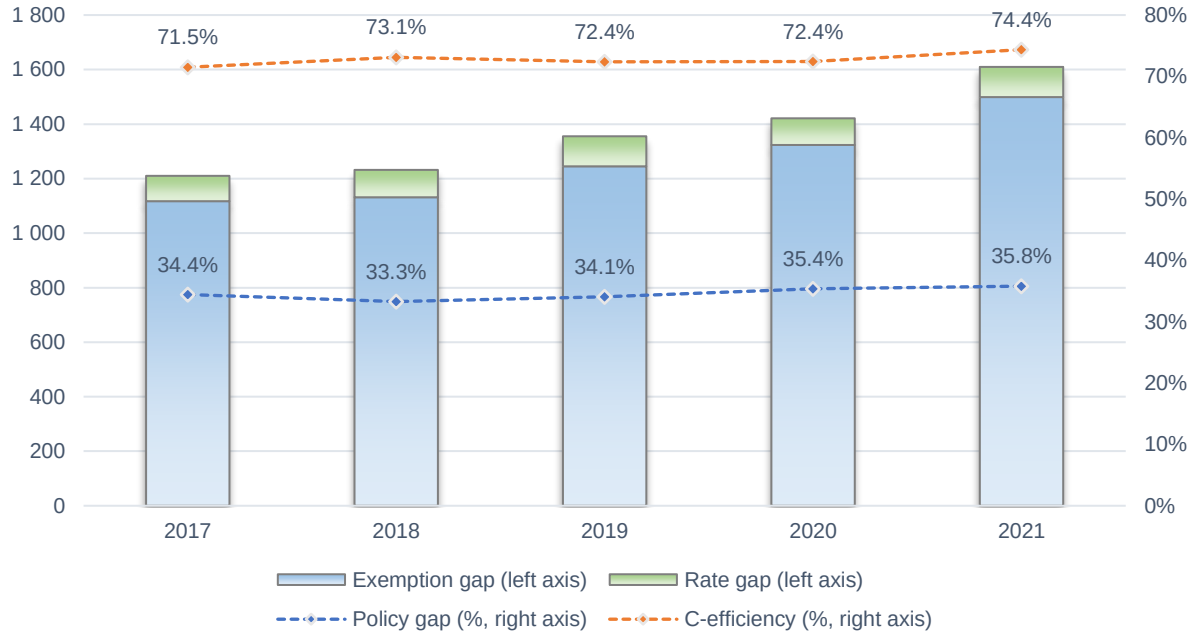
Source: own calculation, download underlying data.

[30] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 18: EE: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**1 210**	**1 232**	**1 355**	**1 421**	**1 610**
Rate gap	93	100	110	98	111
Exemption gap	1 117	1 132	1 245	1 323	1 499
o/w imputed rents	*229*	*240*	*266*	*259*	*333*
o/w public services	*513*	*516*	*590*	*641*	*706*
o/w financial services	*79*	*86*	*99*	*98*	*110*
Actionable exemption gap	**296**	**290**	**290**	**326**	**351**
Actionable policy gap	**389**	**391**	**400**	**424**	**461**
C-efficiency	**71.49%**	**73.12%**	**72.38%**	**72.41%**	**74.36%**

Figure 36: EE: VAT policy gap, rate gap, and exemption gap



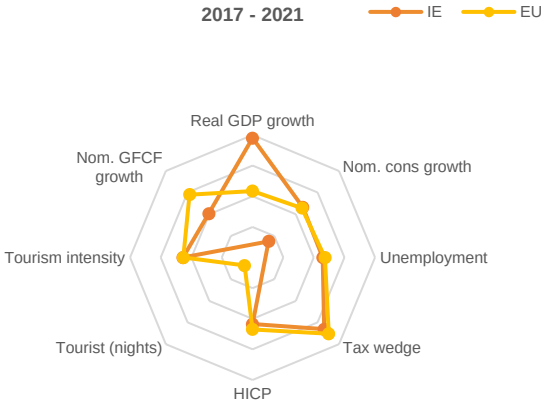
Source: own calculation, download underlying data.

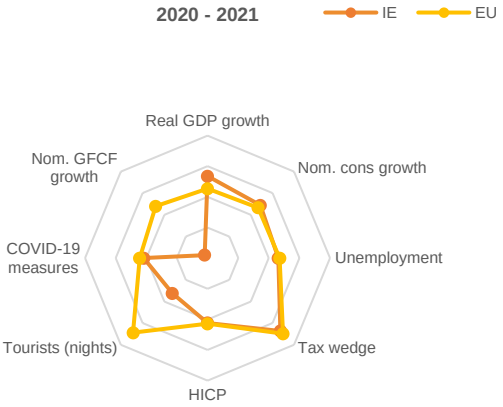
Ireland

Economic and policy context

In 2021, Ireland saw the second highest GDP growth in the EU of 13.6 percent. Exceptional was not only the rate of growth in 2021 but also in 2020, when, despite the COVID-19 pandemic, the economy expanded by over 5 percent. However, even with this economic expansion, the unemployment rate increased to 6.2 percent in 2021. The growth of the VTTL was considerably slower than the growth of GDP. Nominal household and NPISH consumption expenditures, the main component of the VTTL, increased by 8.8 percent. GFCF, mostly driven by private investment, went down by 37.2 percent.

Due to high and increasing volumes of foreign trade and inward investment, GDP in Ireland developed at a very fast pace (38 percent growth between 2017 and 2021). The extraordinary growth was not fully reflected in the growth of the VTTL components. Nominal household and NPISH final consumption growth was approximately 6.5 percent over the four-year period, while GFCF increased by only 0.5 percent. This means that with price inflation of 3.5 percent the VTTL denoted in real terms remained nearly stagnant.





Highlights

- The VAT rate system in Ireland in 2021 saw an important change – the temporary reduction of the standard statutory VAT rate introduced in 2020 was terminated in February 2021. The reduction of the rate applicable to hospitality services – which has a large impact on the economy-wide effective VAT rate – was maintained during the entire fiscal year.
- Even though the effective rate has increased as a result of the abovementioned changes, the policy gap remained almost unchanged in 2021.
- The VAT compliance gap in Ireland decreased significantly in 2021 (-6 pp). This followed a large increase of 4.5 percent in 2020. These sudden changes are caused by the high volatility of revenue figures, which suggests that deferred tax payments in 2020 were not fully accounted for in this calculation.

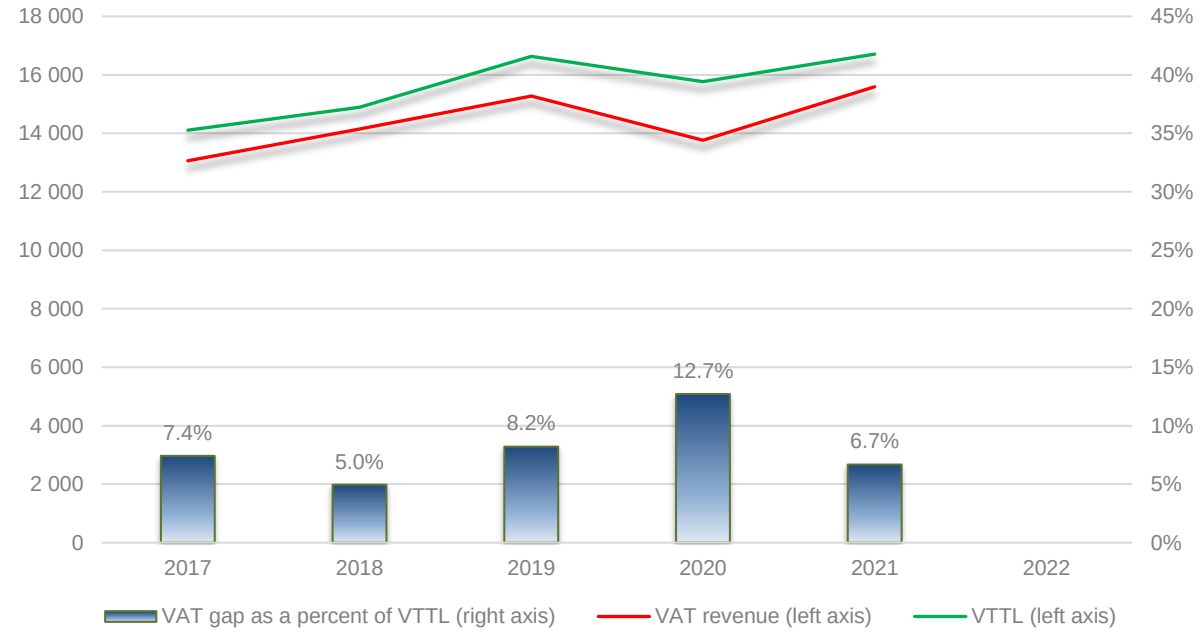
	2017-2021		2020-2021	
Variable	**IE**	**EU**	**IE**	**EU**
GDP (real, % change)	38.0	3.4	13.6	5.4
HH/NPISH cons. (nom)	6.5	5.7	8.8	6.7
Unemployment rate	5.9	7.4	6.2	7.1
Tax wedge	26.2	30.4	27.3	29.7
HICP	3.5	7.0	2.4	2.9
Tourist nights (% change)	-54.9	-32.6	-7.5	28.8
Tourist nights (average)	5.4	5.2	-	-
COVID-19 measures (change)	-	-	1.7	4.3
GFCF (nom, % change)	0.5	18.1	-37.2	8.0

Source: Euorstat

Table 19: IE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**14 107**	**14 886**	**16 636**	**15 770**	**16 708**	*X*
o/w liability on household final consumption	7 278	7 314	8 388	7 141	7 700	
o/w liability on gov. and NPISH final consumption	194	173	176	187	198	
o/w liability on intermediate consumption	4 492	5 076	5 671	6 026	6 290	
o/w liability on GFCF	1 839	2 073	2 113	2 118	2 219	
o/w net adjustments	303	251	287	297	301	
VAT revenue	**13 060**	**14 149**	**15 271**	**13 765**	**15 592**	*X*
VAT compliance gap	**1 047**	**737**	**1 365**	**2 004**	**1 116**	
VAT compliance gap (percent of VTTL)	**7.4%**	**5.0%**	**8.2%**	**12.7%**	**6.7%**	*X*
VAT compliance gap change since 2017					**-0.7 pp**	

Figure 37: IE: VAT compliance gap, VAT revenue, and VTTL

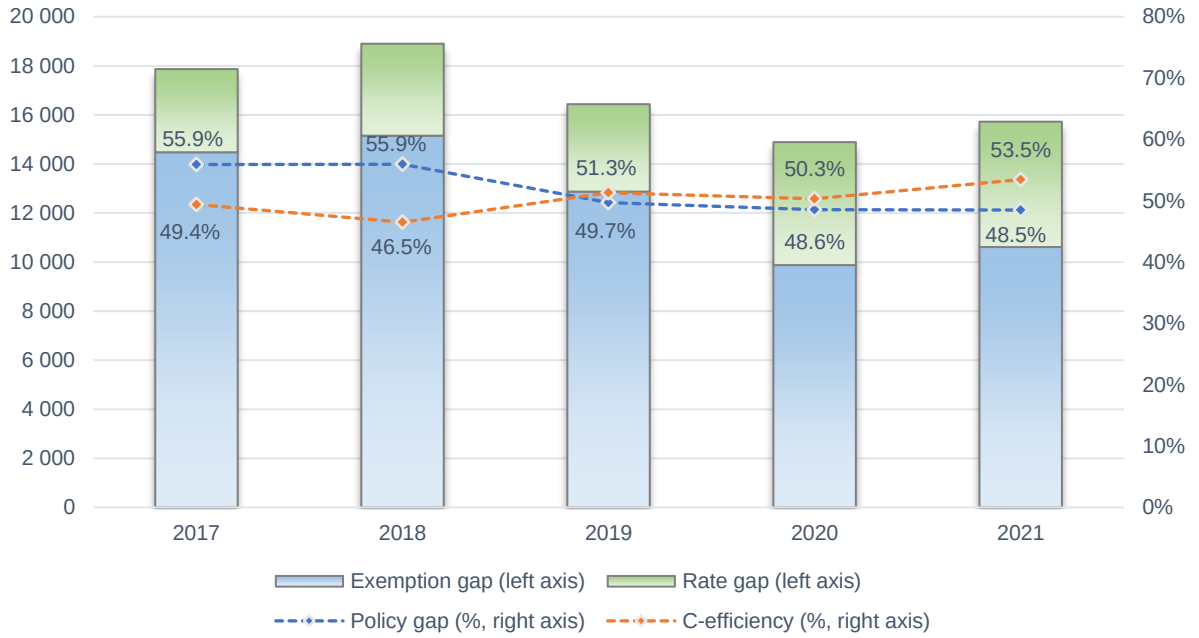


Source: own calculation, download underlying data

Table 20: IE: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**17 866**	**18 900**	**16 436**	**14 888**	**15 722**
Rate gap	3 391	3 750	3 563	5 012	5 110
Exemption gap	14 475	15 150	12 873	9 876	10 612
o/w imputed rents	*3 791*	*3 853*	*4 071*	*4 095*	*4 420*
o/w public services	*8 669*	*9 022*	*7 473*	*6 581*	*6 404*
o/w financial services	*- 13*	*118*	*- 165*	*- 243*	*- 146*
Actionable exemption gap	**2 029**	**2 158**	**1 495**	**- 557**	**- 65**
Actionable policy gap	**5 419**	**5 907**	**5 058**	**4 455**	**5 044**
C-efficiency	**49.39%**	**46.50%**	**51.30%**	**50.29%**	**53.45%**

Figure 38: IE: VAT policy gap, rate gap, and exemption gap



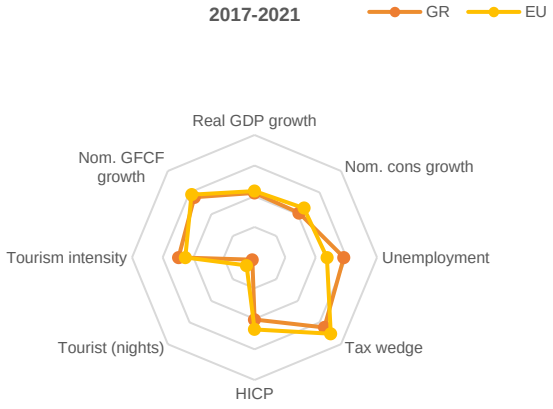
Source: own calculation, download underlying data.

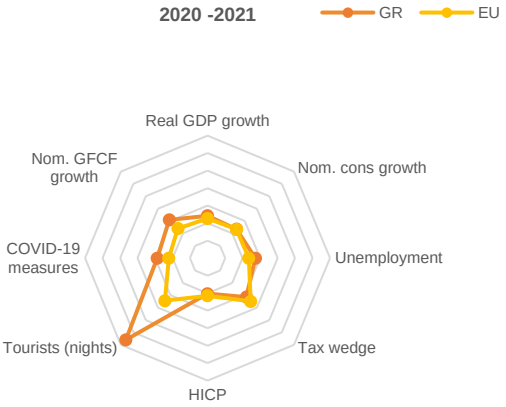
Greece

Economic and policy context

Greece saw a strong economic recovery in 2021 (real GDP growth rate of 8.4 percent). The economic growth was also reflected in a sharp decline in the unemployment rate down to 14.7 percent. The strong economic recovery followed a sharp contraction caused by the COVID-19 crisis. The strong increase in the intensity of COVID-19 measures did not interfere with the very strong recovery in the number of nights spent by tourists (+92 percent). The growth of nominal consumption expenditures of private households and NPISH was ca. 6.8 percent, while GFCF increased by 21.9 percent.

Between 2017 and 2021, the economy of Greece was characterised by a comparably low GDP growth of 2.2 percent and a very low inflation rate of only 0.6 percent. The growth of GFCF (+15.6 percent) was in stark contrast with the stagnant nominal household and NPISH consumption (+1.1 percent in nominal terms). The post-COVID-19 recovery in the number of nights spent by tourists was still incomplete in 2021 with a reduction of -37.9 percent year-over-year. Despite this decline, the average tourism intensity of 9.7 nights per inhabitant was one of the highest in the EU.





Highlights

- In the course of 2020, Greece has temporarily amended its VAT rate structure by reducing rates, among others, for passenger transport, selected entertainment, and tourism services (rate decrease from 24 percent down to 13 percent). The changes introduced at the end of 2020 were maintained until the end of 2023.
- The overall size of policy gap decreased slightly (from 55.8 percent to 55.2 percent of the notional ideal revenue).
- In 2021, the VAT compliance gap in Greece fell by 3.2 pp down to 17.8 percent. This was a continuation of the downward trend that commenced in 2018. Despite the increase in compliance, C-efficiency remains very low, which is largely driven by the elevated policy gap (due to the broad application of reduced rates, among others).

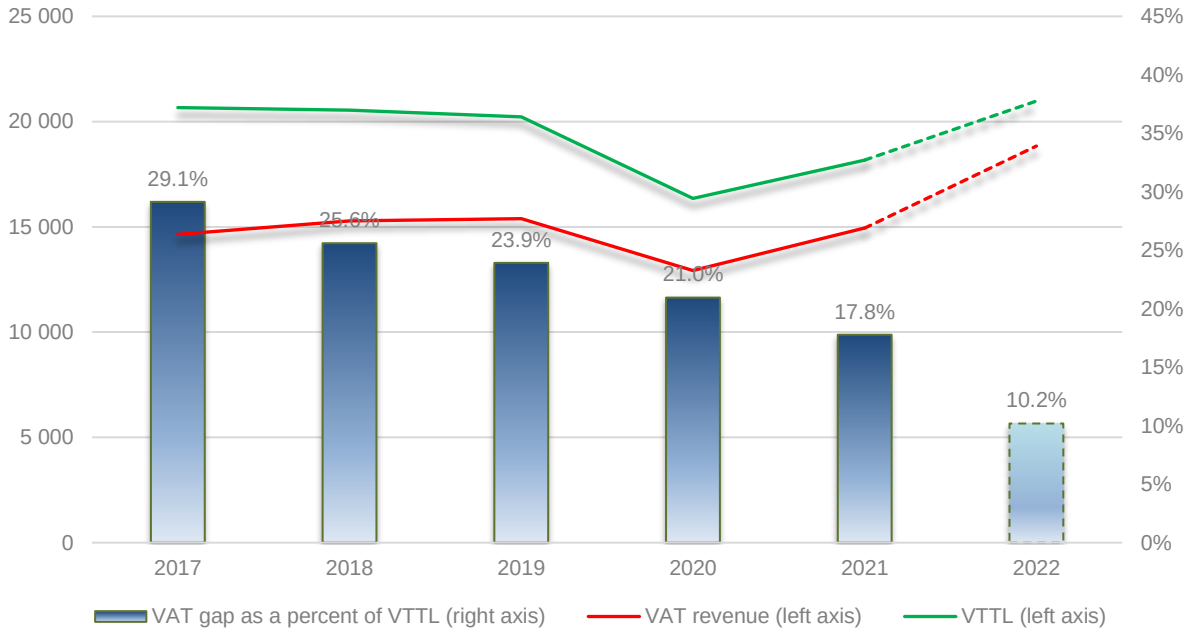
	2017-2021		2020-2021	
Variable	**EL**	**EU**	**EL**	**EU**
GDP (real, % change)	2.2	3.4	8.4	5.4
HH/NPISH cons. (nom)	1.1	5.7	6.8	6.7
Unemployment rate	18.3	7.4	14.7	7.1
Tax wedge	24.6	30.4	22.9	29.7
HICP	0.6	7.0	0.6	2.9
Tourist nights (% change)	-37.9	-32.6	92.0	28.8
Tourist nights (average)	9.7	5.2	-	-
COVID-19 measures (change)	-	-	17.5	4.3
GFCF (nom, % change)	15.6	18.1	21.9	8.0

Source: Euorstat

Table 21: EL: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**20 663**	**20 549**	**20 229**	**16 351**	**18 173**	*20 976*
o/w liability on household final consumption	15 827	16 349	15 960	12 193	13 612	
o/w liability on gov. and NPISH final consumption	734	674	695	809	806	
o/w liability on intermediate consumption	2 189	2 191	2 193	1 915	2 038	
o/w liability on GFCF	1 605	1 047	1 059	1 159	1 425	
o/w net adjustments	308	289	323	277	292	
VAT revenue	**14 642**	**15 288**	**15 390**	**12 925**	**14 942**	*18 839*
VAT compliance gap	**6 021**	**5 261**	**4 839**	**3 426**	**3 231**	
VAT compliance gap (percent of VTTL)	**29.1%**	**25.6%**	**23.9%**	**21.0%**	**17.8%**	*10.2%*
VAT compliance gap change since 2017					**-9.8 pp**	

Figure 39: EL: VAT compliance gap, VAT revenue, and VTTL[31]



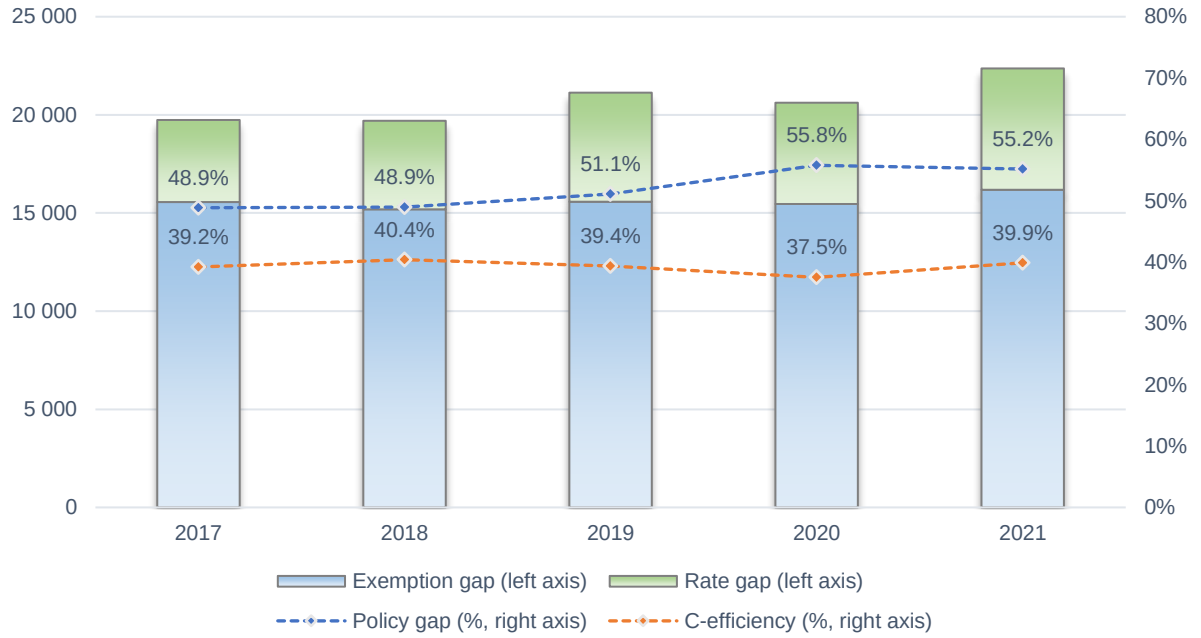
Source: own calculation, download underlying data.

[31] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 22: EL: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**19 738**	**19 698**	**21 130**	**20 618**	**22 365**
Rate gap	4 180	4 511	5 556	5 159	6 182
Exemption gap	15 558	15 187	15 574	15 459	16 183
o/w imputed rents	*3 582*	*3 475*	*3 489*	*3 534*	*3 607*
o/w public services	*6 167*	*6 561*	*6 899*	*6 980*	*6 921*
o/w financial services	*1 060*	*1 079*	*1 004*	*835*	*1 002*
Actionable exemption gap	**4 749**	**4 072**	**4 182**	**4 109**	**4 653**
Actionable policy gap	**8 929**	**8 583**	**9 738**	**9 268**	**10 835**
C-efficiency	**39.19%**	**40.39%**	**39.36%**	**37.51%**	**39.88%**

Figure 40: EL: VAT policy gap, rate gap, and exemption gap



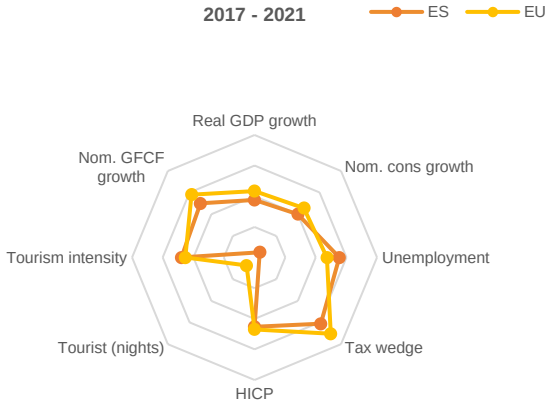
Source: own calculation, download underlying data.

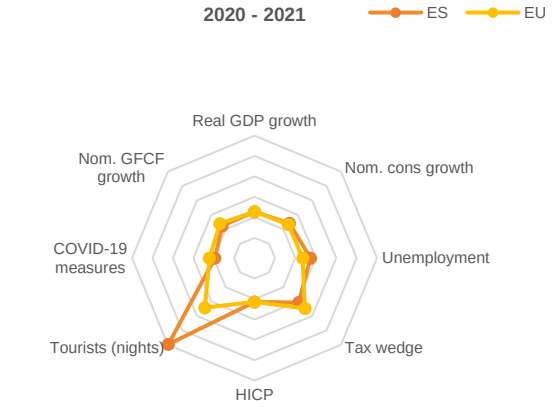
Spain

Economic and policy context

The economy of Spain expanded by 5.5 percent in 2021. Despite this robust growth, Spain has not yet fully recovered from the COVID-19 crisis, having recorded GDP over 5 percent lower than before the pandemic. The intensity of COVID-19 measures decreased slightly in 2021. As a result, there was a strong rebound in the number of nights spent by tourists (+79.4 percent). Consumption expenditures of households and NPISH increased by 8.2 percent. The growth of GFCF was relatively more modest and accounted for 4.8 percent. Inflation, measured as change in the HICP, was at 3 percent, which was close to the EU average.

Looking at the longer term, 2017-2021, real GDP in Spain contracted by 2.4 percent. The stagnant nominal consumption (0.1 percent growth between 2017 and 2021) was the main component of the contraction. At the same time, GFCF increased by 10 percent and consumer prices went up by 5.3 percent. The post-COVID-19 recovery in tourist arrivals has been partial. In 2021, the number of nights spent by tourists in hotel establishments was ca. 45 percent lower than in 2017.





Highlights

- The effective VAT rate in Spain in 2021 increased slightly despite the decrease in the VAT rate (from 21 to 10 percent) applicable for the provision of electricity for households. The incline in the effective rate results partially from the increase in the VAT rate for sugared drinks (from 10 up to 21 percent).
- In 2021, the estimated VAT compliance gap in Spain decreased by almost 5 pp, down to 0.8 percent of the VTTL. This sharp decline, compared to stable estimates in previous years, indicates some potential inaccuracies in the provisional data. Indeed, a large revision of national accounts for Spain is scheduled for the fall of 2023, which might have a significant impact on the estimates of the VAT compliance gap. Unfortunately, the revisions of national accounts were not published before the finalisation of this report. Due to uncertainty around the national accounts' figures, alternative estimates for 2021 are not published.
- Traditionally, Spain has one of the largest policy gaps in the EU – this was also the case in 2021 when the policy gap amounted to 59.0 percent of notional ideal revenue. One of the main reasons for it is the application of other than VAT indirect taxes in the Canary Islands, Ceuta, and Melilla.

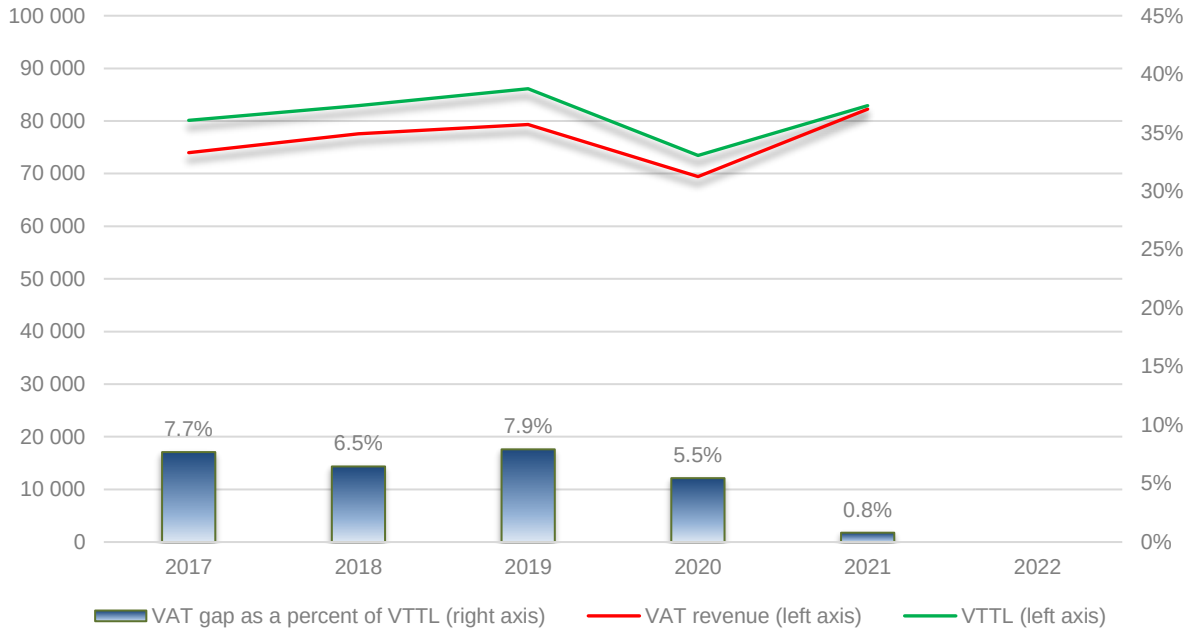
	2017-2021		2020-2021	
Variable	**ES**	**EU**	**ES**	**EU**
GDP (real, % change)	-2.4	3.4	5.5	5.4
HH/NPISH cons. (nom)	0.1	5.7	8.2	6.7
Unemployment rate	15.4	7.4	14.8	7.1
Tax wedge	21.2	30.4	21.4	29.7
HICP	5.3	7.0	3.0	2.9
Tourist nights (% change)	-44.9	-32.6	79.4	28.8
Tourist nights (average)	7.7	5.2	-	-
COVID-19 measures (change)	-	-	-1.1	4.3
GFCF (nom, % change)	10.0	18.1	4.8	8.0

Source: Euorstat

Table 23: ES: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**80 133**	**82 893**	**86 127**	**73 447**	**82 912**	*X*
o/w liability on household final consumption	58 709	60 170	61 266	48 848	55 503	
o/w liability on gov. and NPISH final consumption	2 715	2 894	3 107	3 306	3 497	
o/w liability on intermediate consumption	10 204	10 629	11 362	11 192	11 843	
o/w liability on GFCF	7 758	8 356	9 407	9 176	11 088	
o/w net adjustments	746	844	985	925	981	
VAT revenue	**73 970**	**77 536**	**79 301**	**69 435**	**82 250**	*X*
VAT compliance gap	**6 163**	**5 357**	**6 826**	**4 012**	**662**	
VAT compliance gap (percent of VTTL)	**7.7%**	**6.5%**	**7.9%**	**5.5%**	**0.8%**	*X*
VAT compliance gap change since 2017					**-6.9 pp**	
VAT compliance gap, alternative estimates[32]	4 135	2 099	1 480	161	X	
VAT compliance gap alternative estimates (percent of VTTL)	*5.3%*	*2.6%*	*1.8%*	*0.2%*	*X*	

Figure 41: ES: VAT compliance gap, VAT revenue, and VTTL



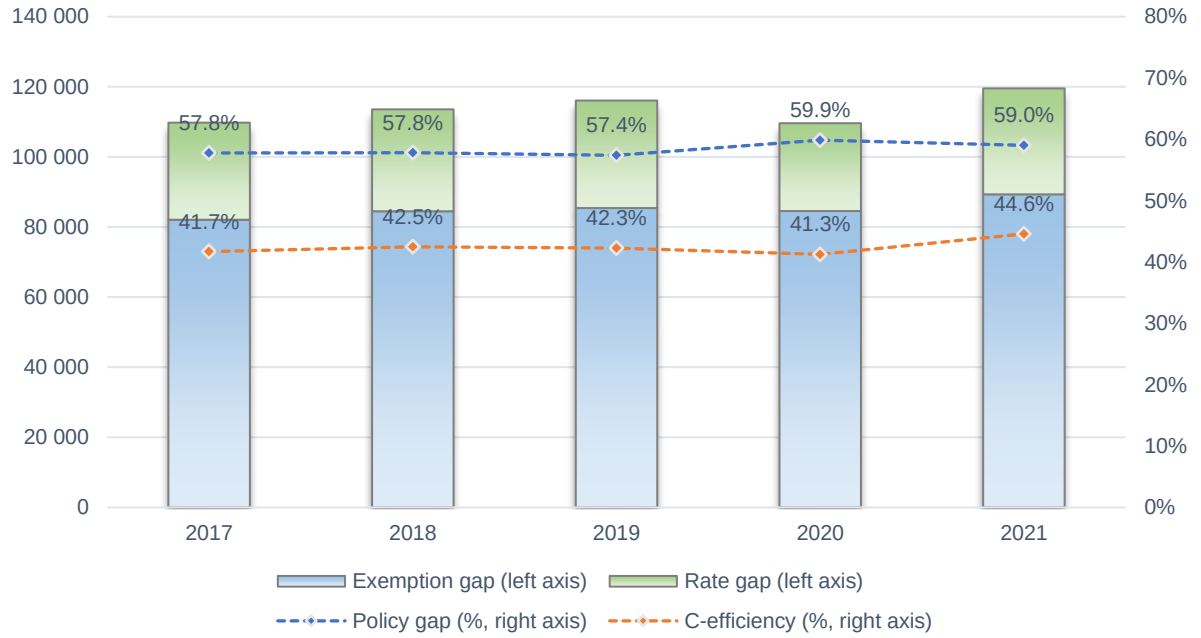
Source: own calculation, download underlying data.

[32] *Based on the adjustment of VAT revenue to an accrual recording criteria based on tax form information 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. Due to uncertainty around the national accounts' figures, alternative estimates for 2021 are not published.*

Table 24: ES: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**109 776**	**113 568**	**116 085**	**109 616**	**119 551**
Rate gap	27 697	29 070	30 669	25 057	30 223
Exemption gap	82 079	84 497	85 416	84 559	89 328
o/w imputed rents	*17 632*	*18 013*	*18 245*	*18 313*	*19 304*
o/w public services	*34 575*	*35 580*	*36 984*	*38 387*	*39 965*
o/w financial services	*4 398*	*5 091*	*5 363*	*5 561*	*6 272*
Actionable exemption gap	**25 474**	**25 814**	**24 824**	**22 298**	**23 786**
Actionable policy gap	**53 172**	**54 884**	**55 493**	**47 356**	**54 009**
C-efficiency	**41.73%**	**42.46%**	**42.30%**	**41.26%**	**44.59%**

Figure 42: ES: VAT policy gap, rate gap, and exemption gap



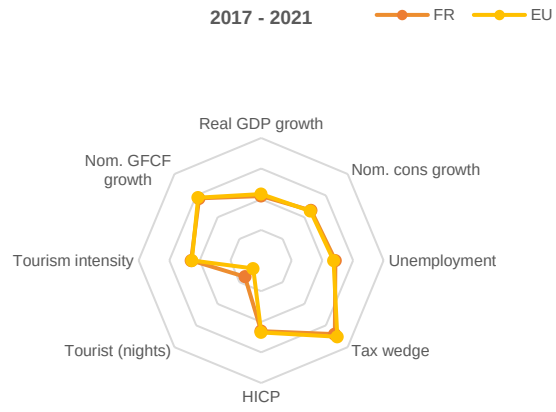
Source: own calculation, download underlying data.

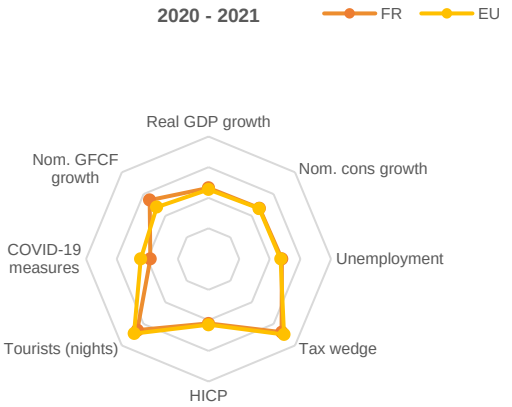
France

Economic and policy context

France saw a relatively strong economic recovery in 2021 (6.4 percent real GDP growth) after a relatively strong contraction in 2020. The economic growth did not lead to any large changes in the labour market. The unemployment rate remained nearly unchanged and amounted to 7.9 percent in 2021. The slight decrease in the intensity of COVID-19 measures supported a solid recovery in the number of nights spent by tourists (+25.8 percent). The growth of nominal consumption expenditures of private households and NPISH was 6.9 percent, while the growth of GFCF was more robust than in most other Member States and amounted to 14.4 percent.

Due to the recession recorded in 2020, GDP growth between 2017 and 2021 was only 2.1 percent. The main components of the VTTL, household and NPISH consumption, and GFCF increased at a pace close to the EU average. The post-COVID-19 recovery in the demand for tourist services proxied by the number of nights spent by tourists was not yet complete (ca. -25 percent compared to 2017). The tax wedge in France was at 28 percent and close to the EU average





Highlights

- In 2021, France maintained the temporary VAT rate reduction for specific hygiene products for protection before the COVID-19 pandemic. No other significant changes to the VAT rate regime were introduced.
- The estimates of the VAT compliance gap in France for 2021 show a sizeable decrease by 3.5 pp, down to 4.9 percent of the VTTL. The nominal change amounted to EUR 5.4 billion which was the third highest reduction of the gap in the EU-27.
- After a fairly large decline in C-efficiency in 2020 (to 48.7 percent), this indicator improved significantly in 2021 (to 52.5 percent) – mostly as a result of improved compliance.

	2017-2021		2020-2021	
Variable	**FR**	**EU**	**FR**	**EU**
GDP (real, % change)	2.1	3.4	6.4	5.4
HH/NPISH cons. (nom)	6.2	5.7	6.9	6.7
Unemployment rate	8.5	7.4	7.9	7.1
Tax wedge	28.0	30.4	27.6	29.7
HICP	6.1	7.0	2.1	2.9
Tourist nights (% change)	-25.1	-32.6	25.8	28.8
Tourist nights (average)	5.7	5.2	-	-
COVID-19 measures (change)	-	-	-1.9	4.3
GFCF (nom, % change)	17.3	18.1	14.4	8.0

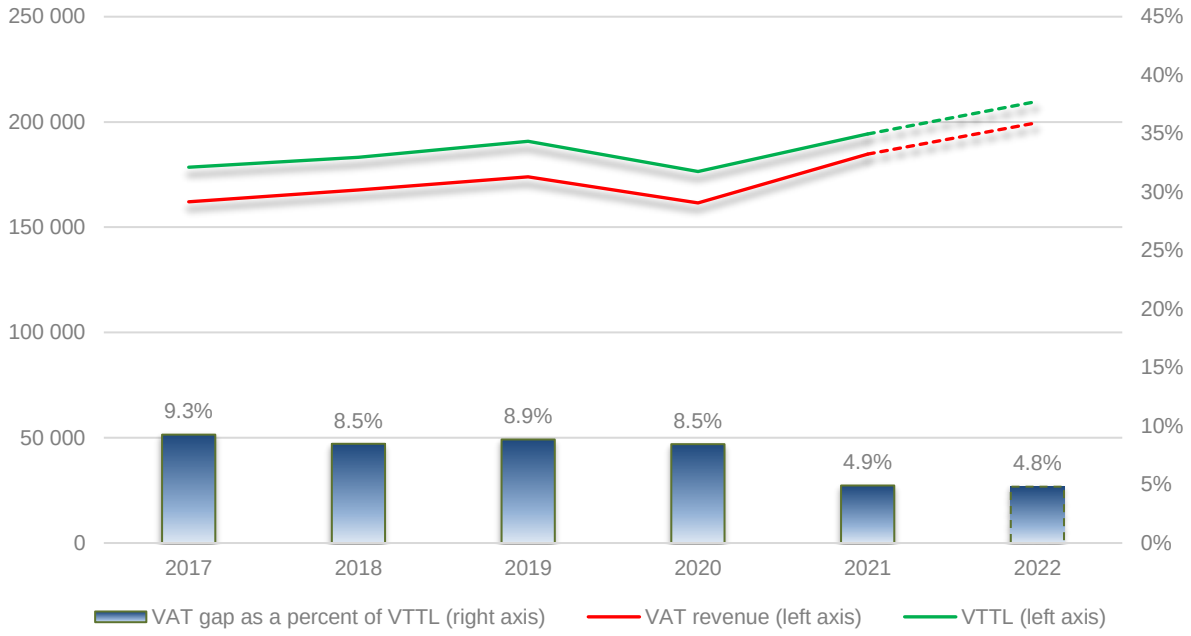
Source: Euorstat

Table 25: FR: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*

VTTL	**178 555**	**183 265**	**190 843**	**176 449**	**194 283**	*209 773*
o/w liability on household final consumption	102 853	106 028	108 486	98 567	107 541	
o/w liability on gov. and NPISH final consumption	1 737	1 777	1 835	1 895	2 047	
o/w liability on intermediate consumption	32 095	32 860	34 207	33 627	37 523	
o/w liability on GFCF	36 803	37 305	40 328	36 510	41 208	
o/w net adjustments	5 067	5 296	5 987	5 850	5 964	
VAT revenue	**162 011**	**167 720**	**173 953**	**161 537**	**184 731**	*199 669*
VAT compliance gap	**16 544**	**15 545**	**16 890**	**14 912**	**9 552**	
VAT compliance gap (percent of VTTL)	**9.3%**	**8.5%**	**8.9%**	**8.5%**	**4.9%**	*4.8%*
VAT compliance gap change since 2017					**-4.3 pp**[33]	

Figure 43: FR: VAT compliance gap, VAT revenue, and VTTL[34]



Source: own calculation, download underlying data.

Table 26: FR: VAT policy gap and its components (EUR million, 2017-2021)

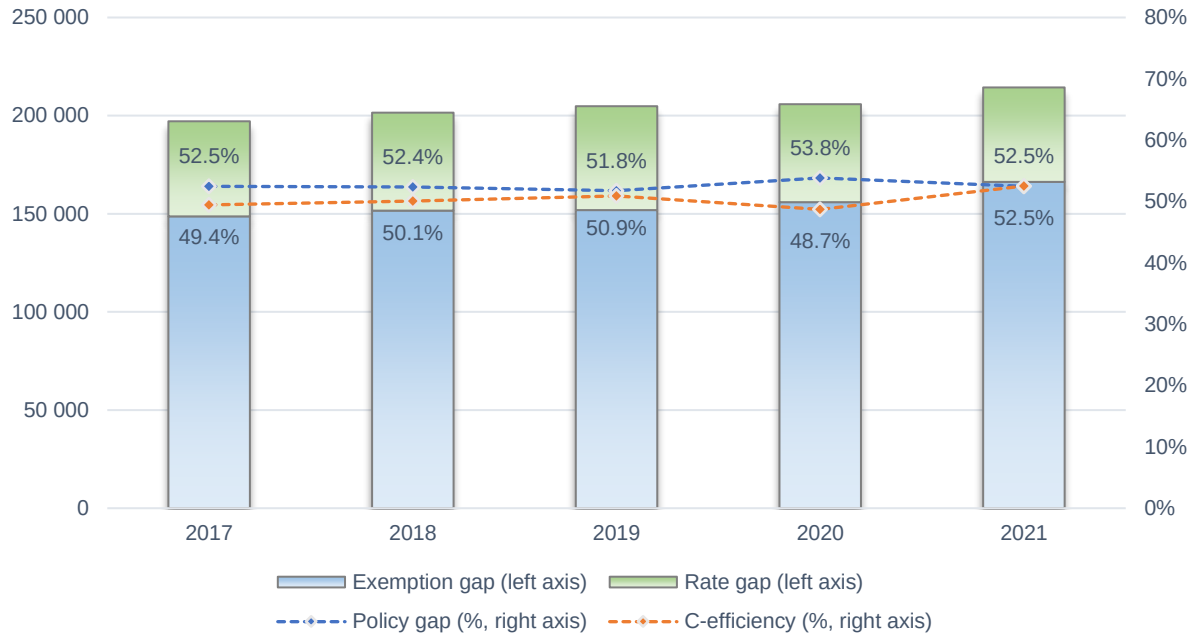
	2017	2018	2019	2020	2021
VAT policy gap	**197 126**	**201 512**	**204 799**	**205 821**	**214 369**
Rate gap	48 445	49 905	52 917	49 905	48 117
Exemption gap	148 682	151 607	151 882	155 917	166 252

[33] *Numbers do not add up due to rounding.*

[34] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

o/w imputed rents	*34 581*	*35 223*	*36 082*	*36 405*	*37 931*
o/w public services	*83 728*	*84 302*	*84 773*	*87 487*	*92 607*
o/w financial services	*11 402*	*11 794*	*11 075*	*10 106*	*11 013*
Actionable exemption gap	**18 970**	**20 287**	**19 952**	**21 919**	**24 701**
Actionable policy gap	**67 415**	**70 192**	**72 869**	**71 824**	**72 818**
C-efficiency	**49.45%**	**50.09%**	**50.92%**	**48.71%**	**52.52%**

Figure 44: FR: VAT policy gap, rate gap, and exemption gap



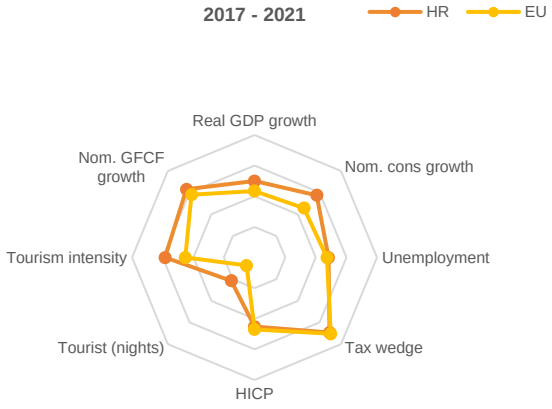
Source: own calculation, download underlying data.

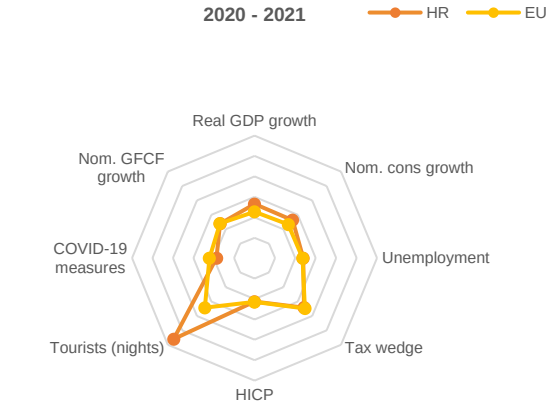
Croatia

Economic and policy context

Croatia saw a very strong economic recovery in 2021 with a real GDP growth rate of 13.1 percent. The economic growth, however, was not reflected in the unemployment rate which slightly increased to 7.6 percent. A strong economic recovery followed the sharp contraction in 2020. The recovery was largely driven by the revival of tourism. The number of arrivals to hotels and other tourist establishments increased by 72.1 percent. As a result, the final consumption of households increased by 12.7 percent in nominal terms. Inflation, measured as the change in the HICP, was at 2.7 percent and slightly below the EU average.

Between 2017 and 2021, the economy of Croatia increased by 10 percent. The strong real growth is a result of sizeable growth in household and NPISH final consumption (+17.4 percent in nominal terms) and above the EU-average GFCF growth (+22.9 percent). The post-COVID-19 recovery in the tourism sector was more complete than in many other tourist destinations (-18.5 percent compared to 2017). The tax wedge in Croatia was at 29.3 percent, close to the EU average.





Highlights

- In 2021, Croatia increased the VAT threshold for the taxation procedure based on collected fees from HRK 7.5 million to HRK 15 million.
- The estimated VAT compliance gap for 2021 in Croatia remained nearly unchanged. Except for the shift in 2019, the compliance gap remained very stable. This may indicate some inaccuracies in the data utilised for the calculation of the VTTL for this particular year.
- The policy gap in Croatia fell by almost 2 pp in 2021 but still remains significantly above the levels observed in 2017 and 2018 – since the beginning of 2019, the application of reduced rates was significantly expanded.

	2017-2021		2020-2021	
Variable	**HR**	**EU**	**HR**	**EU**
GDP (real, % change)	10.0	3.4	13.1	5.4
HH/NPISH cons. (nom)	17.4	5.7	12.7	6.7
Unemployment rate	8.3	7.4	7.6	7.1
Tax wedge	29.3	30.4	28.5	29.7
HICP	5.1	7.0	2.7	2.9
Tourist nights (% change)	-18.5	-32.6	72.1	28.8
Tourist nights (average)	18.5	5.2	-	-
COVID-19 measures (change)	-	-	-2.9	4.3
GFCF (nom, % change)	22.9	18.1	7.7	8.0

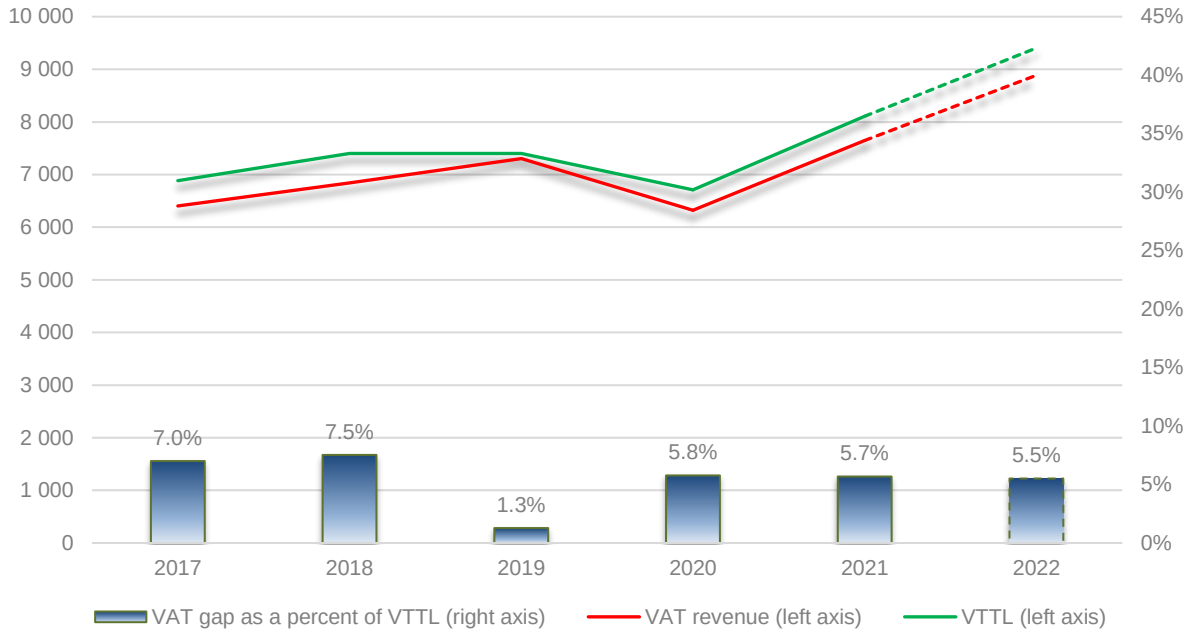
Source: Euorstat

Table 27: HR: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*

VTTL	**6 886**	**7 398**	**7 399**	**6 710**	**8 108**	*9 405*
o/w liability on household final consumption	5 079	5 353	5 411	4 704	5 896	
o/w liability on gov. and NPISH final consumption	216	191	192	199	216	
o/w liability on intermediate consumption	991	1 015	1 019	850	997	
o/w liability on GFCF	586	820	785	921	957	
o/w net adjustments	13	20	- 8	35	42	
VAT revenue	**6 404**	**6 841**	**7 305**	**6 322**	**7 647**	*8 887*
VAT compliance gap	**482**	**557**	**94**	**388**	**461**	
VAT compliance gap (percent of VTTL)	**7.0%**	**7.5%**	**1.3%**	**5.8%**	**5.7%**	*5.5%*
VAT compliance gap change since 2017					**-1.3 pp**	

Figure 45: HR: VAT compliance gap, VAT revenue, and VTTL[35]



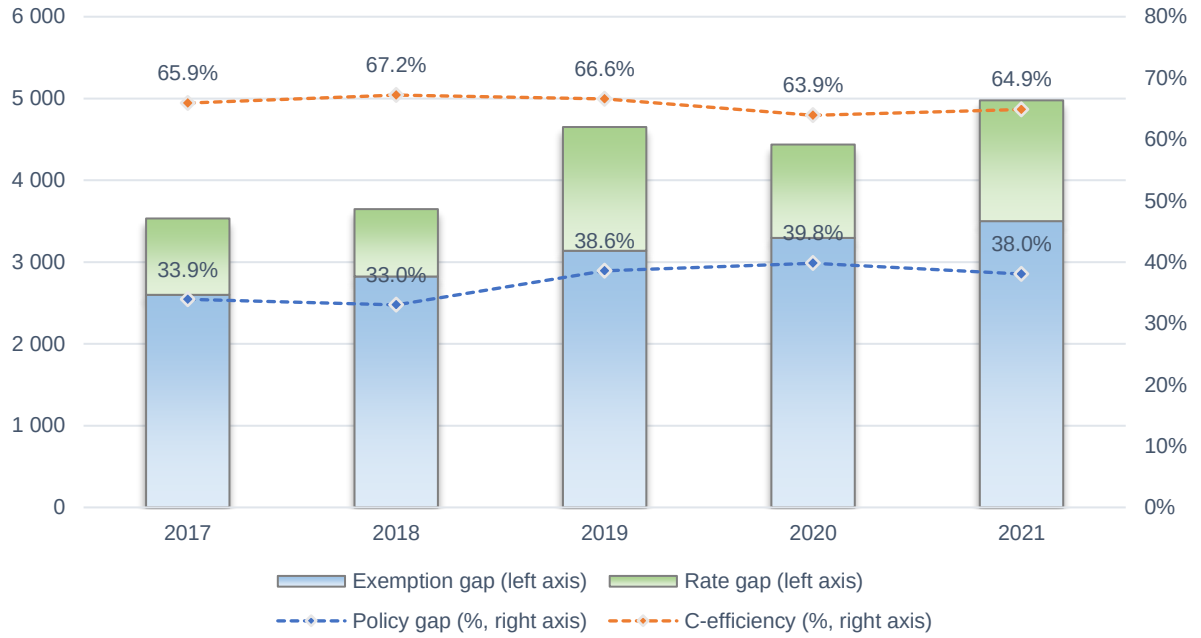
Source: own calculation, download underlying data.

[35] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 28: HR: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**3 533**	**3 647**	**4 651**	**4 437**	**4 977**
Rate gap	934	824	1 513	1 142	1 477
Exemption gap	2 599	2 824	3 138	3 295	3 500
o/w imputed rents	*757*	*764*	*789*	*801*	*818*
o/w public services	*1 448*	*1 357*	*1 724*	*1 770*	*1 913*
o/w financial services	*269*	*61*	*307*	*214*	*253*
Actionable exemption gap	**126**	**641**	**318**	**510**	**516**
Actionable policy gap	**1 059**	**1 465**	**1 831**	**1 652**	**1 993**
C-efficiency	**65.90%**	**67.23%**	**66.61%**	**63.93%**	**64.89%**

Figure 46: HR: VAT policy gap, rate gap, and exemption gap



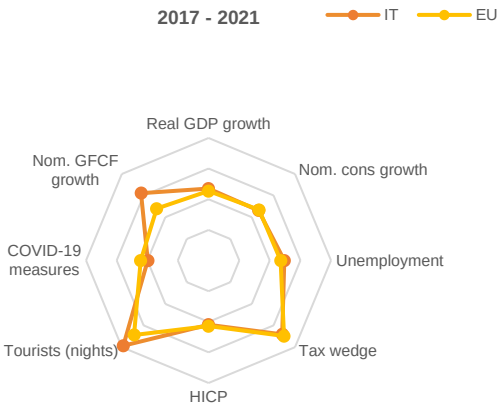
Source: own calculation, download underlying data.

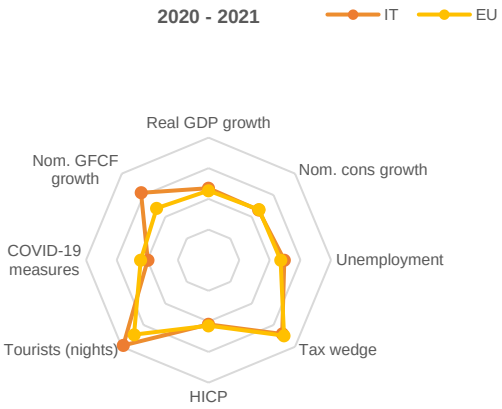
Italy

Economic and policy context

Despite the economic rebound of 7 percent in 2021, the unemployment rate increased up to 9.5 percent and real GDP did not return to the pre-COVID-19 level. The intensity of the COVID-19 containment measures decreased slightly in 2021 and the number of nights spent by tourists saw a strong rebound of 38.7 percent. The growth of nominal consumption expenditures of private households and NPISH was robust (+6.3 percent), and the growth of GFCF was significantly above the EU-average (+22.3 percent). Inflation, measured as change in the HICP, was relatively low at only 1.9 percent.

In 2021, the economy of Italy was still below the 2017 level (-1.2 percent). This and relatively low consumer price inflation was reflected in a decline in nominal household and NPISH final consumption of -2.1 percent. All these determinants contribute to a sluggish development of the VTTL, which did not help the increase in compliance observed over the period. In contrast, growth of GFCF was robust (+20.2 percent).





Highlights

- The VAT compliance gap in Italy fell in 2021 by 10.7 pp compared to 2020. This marks the highest drop among EU-27 Member States, both in relative and absolute terms. Nominally, it decreased by EUR 12.7 billion, which contributed 32 percent to the overall reduction of the gap in the EU. Based on fast estimates, the gap will decrease further in 2022 and go below 10 percent of the VTTL for the first time since the beginning of the study.
- According to the information shared by the Italian authorities, baseline estimates for 2021 based on Eurostat VAT revenue figures are underestimated by approximately 2 pp. This results from the non-inclusion of changes in the stock of VAT credit not accounted for in the figures published by Eurostat. The bulk of the drop in the compliance gap, i.e., approximately 9 pp, appears to be related to a permanent increase in compliance rather than temporary unexplained shifts or inaccuracies.
- The VAT policy gap in Italy increased from 55.4 percent in 2020 to 56.2 percent in 2021 and it remains one of the highest in the EU.

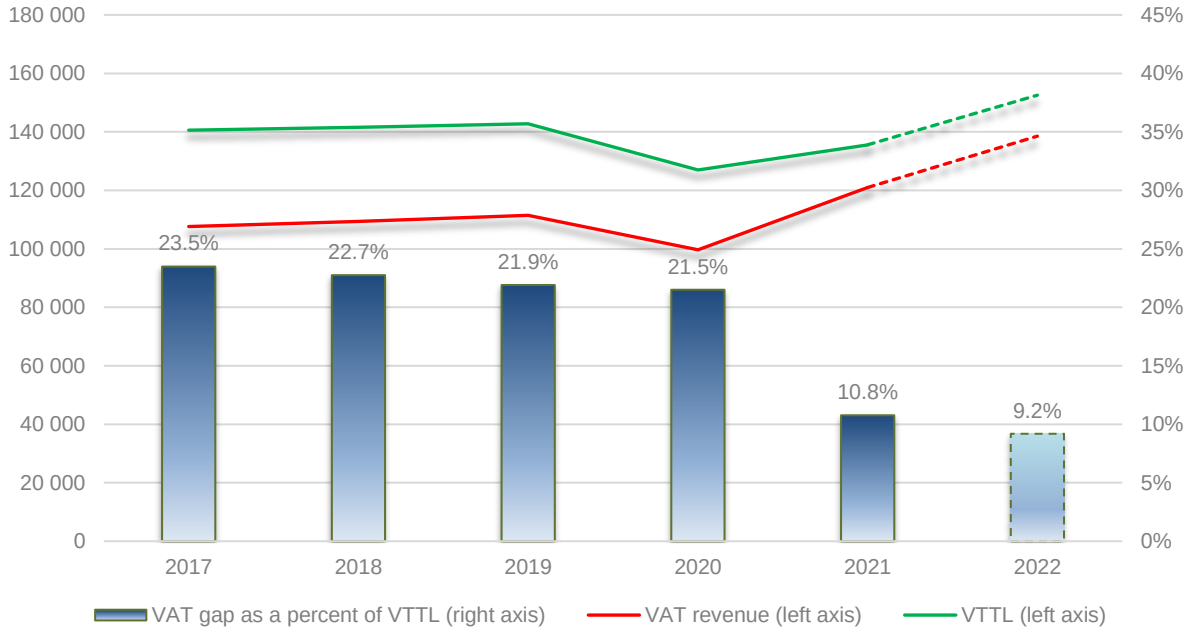
	2017-2021		2020-2021	
Variable	**IT**	**EU**	**IT**	**EU**
GDP (real, % change)	-1.2	3.4	7.0	5.4
HH/NPISH cons. (nom)	-2.1	5.7	6.3	6.7
Unemployment rate	10.1	7.4	9.5	7.1
Tax wedge	30.4	30.4	28.2	29.7
HICP	3.7	7.0	1.9	2.9
Tourist nights (% change)	-31.3	-32.6	38.7	28.8
Tourist nights (average)	5.9	5.2	-	-
COVID-19 measures (change)	-	-	-0.3	4.3
GFCF (nom, % change)	20.2	18.1	22.3	8.0

Source: Euorstat

Table 29: IT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**140 593**	**141 528**	**142 731**	**126 968**	**135 580**	*152 551*
o/w liability on household final consumption	100 344	102 153	103 383	89 444	93 616	
o/w liability on gov. and NPISH final consumption	1 689	1 597	1 605	1 605	1 677	
o/w liability on intermediate consumption	22 324	22 332	22 572	21 962	22 165	
o/w liability on GFCF	14 625	13 696	15 098	13 948	17 813	
o/w net adjustments	1 611	1 751	73	8	309	
VAT revenue	**107 576**	**109 333**	**111 464**	**99 669**	**120 980**	*138 537*
VAT compliance gap	**33 017**	**32 195**	**31 267**	**27 299**	**14 600**	
VAT compliance gap (percent of VTTL)	**23.5%**	**22.7%**	**21.9%**	**21.5%**	**10.8%**	*9.2%*
VAT compliance gap change since 2017					**-12.7 pp**	
VAT compliance gap, alternative estimates[36]	35 747	29 702	27 294	24 937	15 289	
VAT compliance gap alternative estimates (percent of VTTL)	*25.8%*	*21.2%*	*19.4%*	*19.9%*	*11.6%*	

Figure 47: IT: VAT compliance gap, VAT revenue, and VTTL[37]



Source: own calculation, download underlying data.

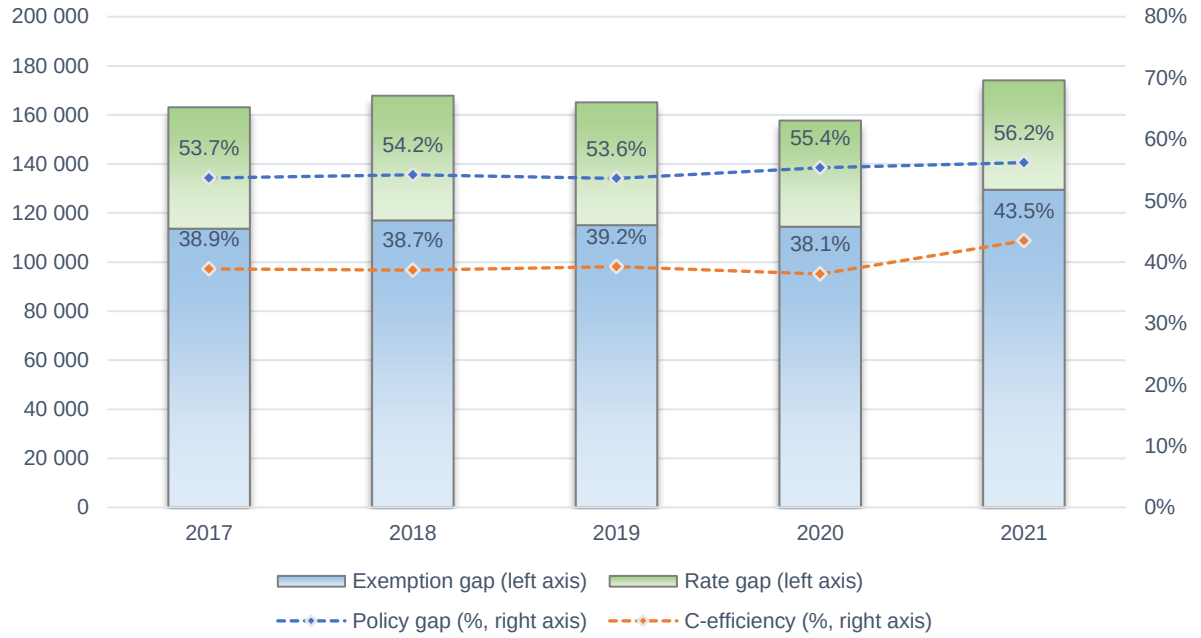
[36] *The alternative estimates are based on adjusted revenues for the changes in the outstanding stocks of net reimbursement claims (to better approximate accrued revenues) and Italy's own estimates of illegal activities, namely illegal drugs and prostitution activities.*

[37] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 30: IT: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**163 090**	**167 803**	**165 098**	**157 668**	**174 057**
Rate gap	49 486	50 814	50 053	43 265	44 584
Exemption gap	113 604	116 989	115 045	114 403	129 473
o/w imputed rents	*32 440*	*32 879*	*32 846*	*32 497*	*33 678*
o/w public services	*55 132*	*56 486*	*54 321*	*55 310*	*58 163*
o/w financial services	*3 563*	*4 331*	*4 463*	*3 440*	*3 860*
Actionable exemption gap	**22 468**	**23 293**	**23 416**	**23 155**	**33 773**
Actionable policy gap	**71 954**	**74 107**	**73 469**	**66 420**	**78 357**
C-efficiency	**38.87%**	**38.69%**	**39.23%**	**38.06%**	**43.46%**

Figure 48: IT: VAT policy gap, rate gap, and exemption gap



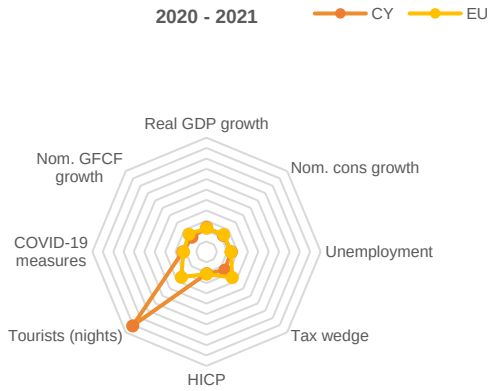
Source: own calculation, download underlying data.

Cyprus

Economic and policy context

As one of the EU economies most dependent on tourist arrivals, Cyprus saw a strong economic recovery in 2021 parallel to the rebound in tourist arrivals. The economy increased by 6.6 percent while the number of tourist nights spent in hotel establishments increased by over 160 percent. Despite this recovery, the decrease in the unemployment rate was moderate. In contrast to the growth of consumption expenditures of households and NPISH (of 5.5 percent in nominal terms), GFCF remained stagnant. Inflation, measured as change in the HICP, was at 2.3 percent and below the average in the EU-27.

Real GDP growth of 13.7 percent between 2017 and 2021 was supported by a relatively strong development in nominal consumption (+8 percent). Growth of GFCF amounted to 10.6 percent but was considerably below the EU average. Cyprus stood out from the other EU economies in the shape of its tax and social contributions system – the tax wedge between 2017 and 2021 amounted to only 8.9 percent.



Highlights

- In November 2021, Cyprus temporarily decreased the rate applicable to the provision of electricity for households (down to 5 percent for vulnerable households and 9 percent for other households).
- In 2021, the VAT compliance gap in Cyprus declined by 9.2 pp, which was the second highest relative reduction of the gap. This comes after a large increase in 2020. Similar to other cases, this volatility in the size of the gap suggests that revenue figures do not fully account for deferrals between 2020 and 2021. The uncertainty over the revenue figures continues in 2022, thus fast estimates have not been presented in this report.
- The policy gap in Cyprus remains relatively low compared to other EU Member States. This was largely caused by the relatively low policy gap, which was mainly driven by the large role of the financial sector providing their services abroad and no right to deduct input VAT by these providers on the services provided within the EU. As a result, large sums of hidden tax increased overall VAT revenue compared to the scenario assuming the taxability of output and the deductibility of intermediate inputs.

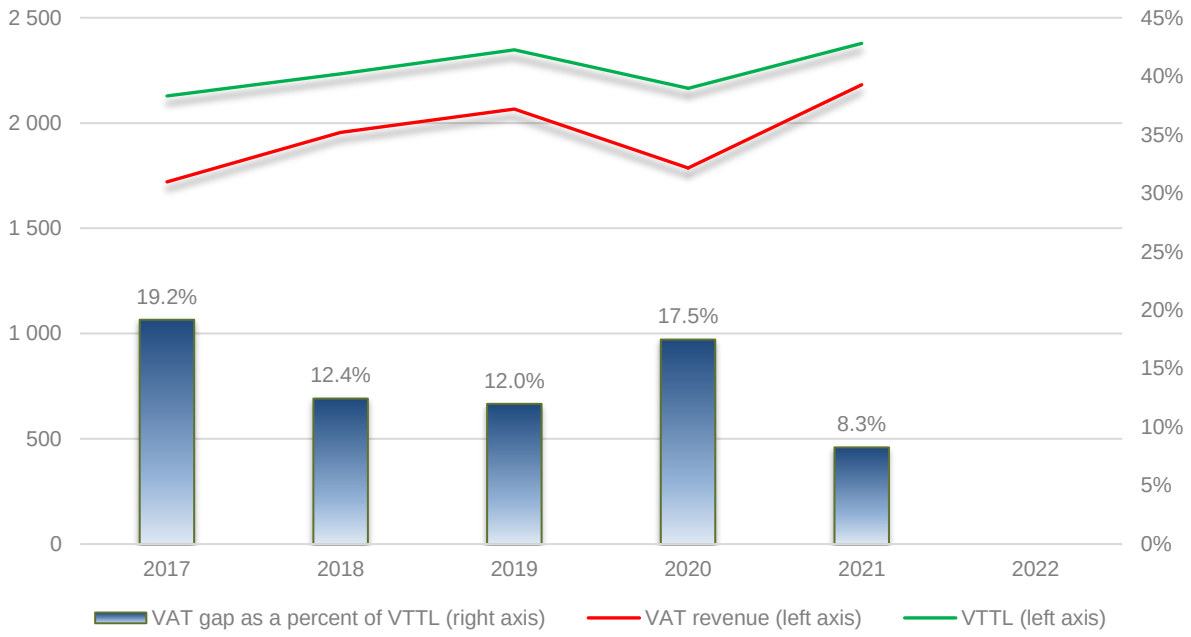
	2017-2021		2020-2021	
Variable	**CY**	**EU**	**CY**	**EU**
GDP (real, % change)	13.7	3.4	6.6	5.4
HH/NPISH cons. (nom)	8.0	5.7	5.5	6.7
Unemployment rate	8.3	7.4	7.5	7.1
Tax wedge	8.9	30.4	9.9	29.7
HICP	2.5	7.0	2.3	2.9
Tourist nights (% change)	-41.9	-32.6	161.5	28.8
Tourist nights (average)	14.9	5.2	-	-
COVID-19 measures (change)	-	-	5.7	4.3
GFCF (nom, % change)	10.6	18.1	0.2	8.0

Source: Euorstat

Table 31: CY: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**2 128**	**2 233**	**2 347**	**2 164**	**2 378**	*X*
o/w liability on household final consumption	1 231	1 298	1 341	1 100	1 264	
o/w liability on gov. and NPISH final consumption	26	28	29	36	41	
o/w liability on intermediate consumption	441	486	522	549	589	
o/w liability on GFCF	427	413	445	467	471	
o/w net adjustments	4	7	10	12	12	
VAT revenue	**1 720**	**1 955**	**2 066**	**1 786**	**2 182**	*X*
VAT compliance gap	**408**	**278**	**281**	**378**	**197**	
VAT compliance gap (percent of VTTL)	**19.2%**	**12.4%**	**12.0%**	**17.5%**	**8.3%**	*X*
VAT compliance gap change since 2017					**-10.9 pp**	

Figure 49: CY: VAT compliance gap, VAT revenue, and VTTL

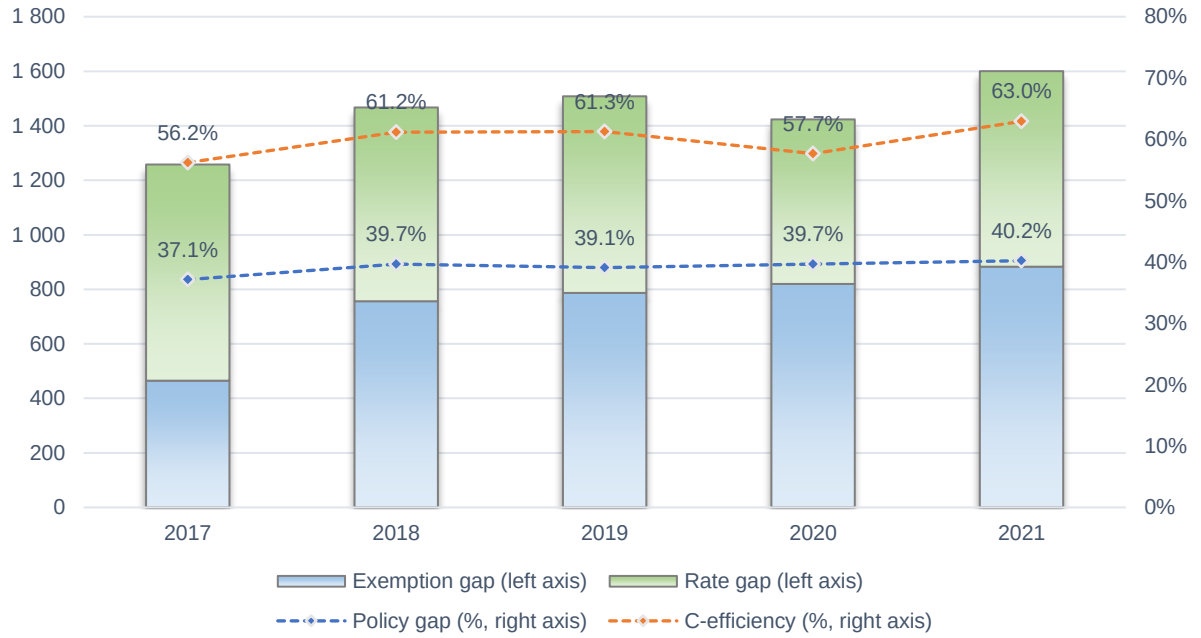


Source: own calculation, download underlying data.

Table 32: CY: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**1 258**	**1 467**	**1 508**	**1 423**	**1 600**
Rate gap	793	711	721	604	717
Exemption gap	465	756	787	820	883
o/w imputed rents	*224*	*237*	*251*	*253*	*271*
o/w public services	*440*	*463*	*507*	*603*	*689*
o/w financial services	*- 133*	*- 131*	*- 134*	*- 169*	*- 184*
Actionable exemption gap	**- 66**	**187**	**164**	**132**	**107**
Actionable policy gap	**727**	**898**	**885**	**736**	**824**
C-efficiency	**56.22%**	**61.17%**	**61.26%**	**57.65%**	**62.95%**

Figure 50: CY: VAT policy gap, rate gap, and exemption gap



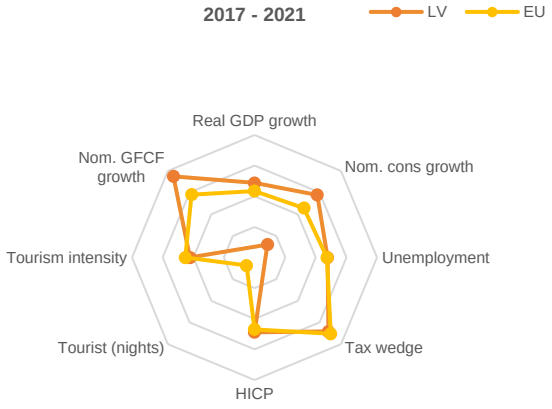
Source: own calculation, download underlying data.

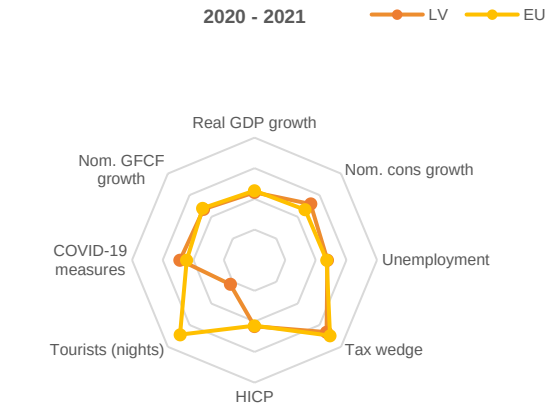
Latvia

Economic and policy context

The economy of Latvia expanded in 2021 by 4.3 percent. The slower pace of growth than the EU-average was caused by the relatively mild impact of the COVID-19 pandemic and related containment measures implemented in 2020 (-2.3 percent change in GDP in 2020). GDP robustly increased despite the increase in the intensity of COVID-19 measures and the drop in tourist arrivals – clearly a signal of the low reliance of Latvia on the tourism and related sectors. The VTTL was driven by the growth of consumption expenditures of private households and NPISH (+11.9 percent in nominal terms). GFCF increased by 7.1 percent. Inflation, measured as change in the HICP, amounted to 3.2 percent.

Between 2017 and 2021, GDP growth was robust and relatively stable (8.7 percent growth between 2017 and 2022). Real growth was accompanied by a comparably high inflation rate of 8.9 percent. As a result, household and NPISH final consumption increased by 17.9 percent and GFCF went up by 34.9 percent. The impact of tourism on the economy was low (2.2 nights per inhabitant spent in hotel establishments), thus the only partial revival of the tourism industry and related sectors did not weigh strongly on the development of the economy in recent years and the increase in VAT compliance





Highlights

- Reduced 5% rate initially introduced in 2018 (for a period of 3 years) applicable on the provision of certain fresh fruits, berries and vegetables was extended until the end of 2023. In spite of this, the rate gap in Latvia is still among the lowest in the EU.
- The VAT compliance gap in Latvia decreased by 1.6 pp in 2021 compared to 2020. This marks another year of a steady increase in VAT compliance. Fast estimates show that this trend should continue in 2022.

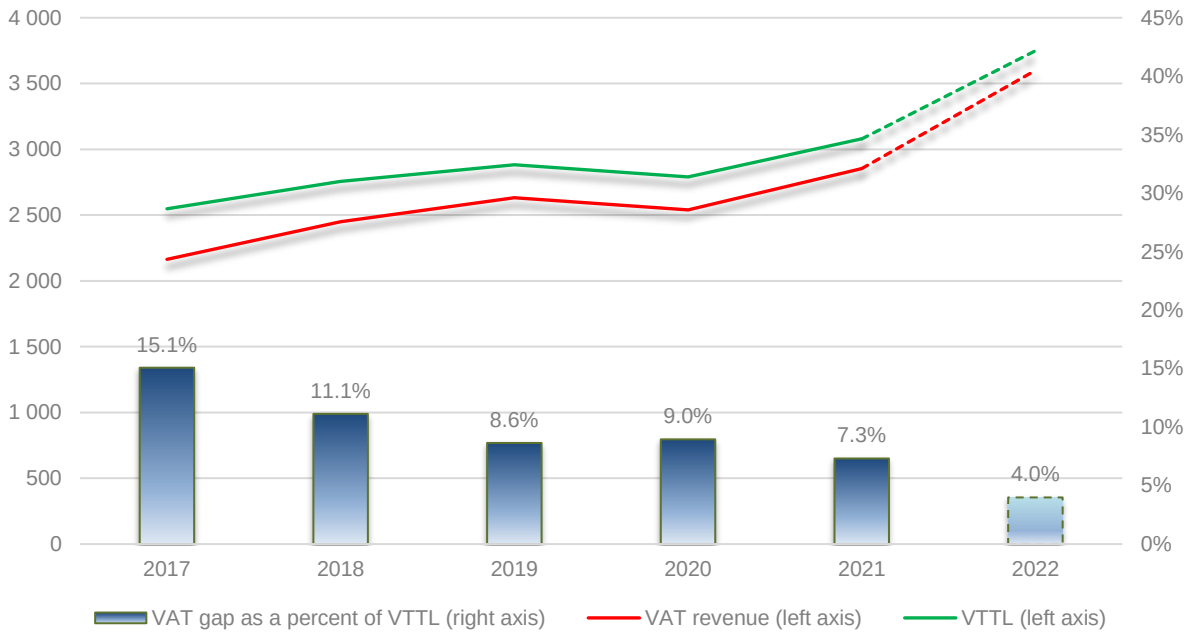
	2017-2021		2020-2021	
Variable	**LV**	**EU**	**LV**	**EU**
GDP (real, % change)	8.7	3.4	4.3	5.4
HH/NPISH cons. (nom)	17.9	5.7	11.9	6.7
Unemployment rate	7.6	7.4	7.6	7.1
Tax wedge	28.3	30.4	26.5	29.7
HICP	8.9	7.0	3.2	2.9
Tourist nights (% change)	-51.9	-32.6	-17.6	28.8
Tourist nights (average)	2.2	5.2	-	-
COVID-19 measures (change)	-	-	8.7	4.3
GFCF (nom, % change)	34.9	18.1	7.1	8.0

Source: Euorstat

Table 33: LV: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**2 548**	**2 756**	**2 881**	**2 790**	**3 079**	*3 749*
o/w liability on household final consumption	1 963	2 068	2 114	2 015	2 242	
o/w liability on gov. and NPISH final consumption	66	69	84	89	113	
o/w liability on intermediate consumption	347	373	428	421	451	
o/w liability on GFCF	217	293	306	311	316	
o/w net adjustments	- 45	- 47	- 50	- 46	- 42	
VAT revenue	**2 164**	**2 449**	**2 632**	**2 541**	**2 854**	*3 599*
VAT compliance gap	**384**	**307**	**249**	**250**	**225**	
VAT compliance gap (percent of VTTL)	**15.1%**	**11.1%**	**8.6%**	**9.0%**	**7.3%**	*4.0%*
VAT compliance gap change since 2017					**-7.8 pp**	

Figure 51: LV: VAT compliance gap, VAT revenue, and VTTL[38]



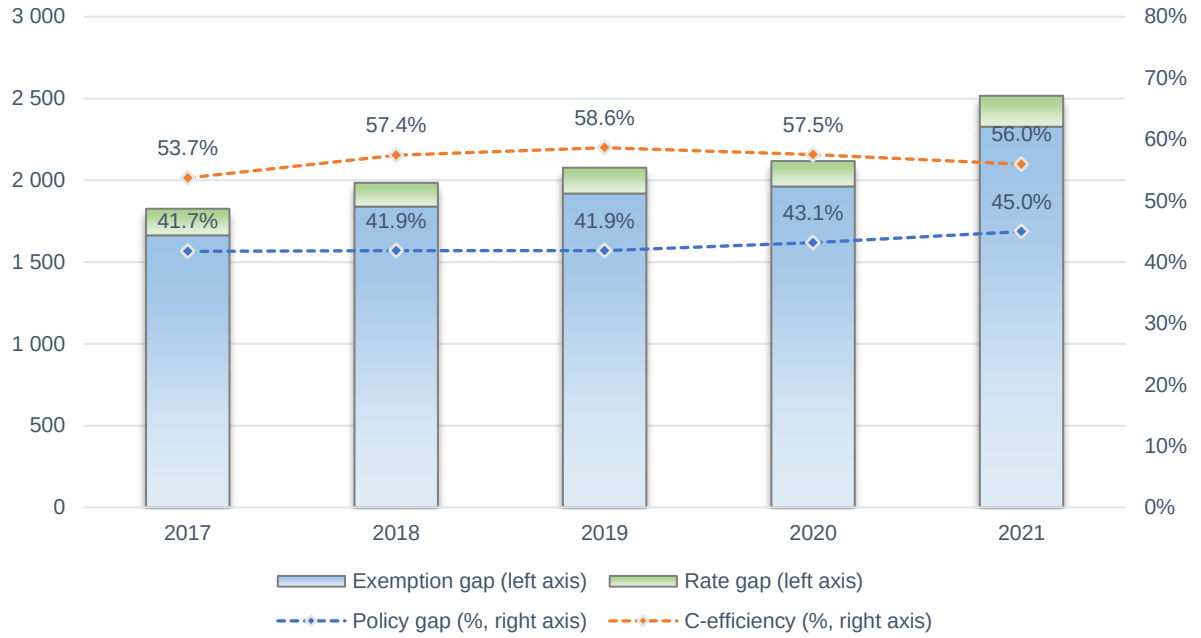
Source: own calculation, download underlying data.

[38] *The level of confidence around estimates for 2021 is higher as they are based simplified methodology and more aggregate data.*

Table 34: LV: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**1 826**	**1 985**	**2 077**	**2 118**	**2 516**
Rate gap	163	146	158	156	189
Exemption gap	1 663	1 839	1 919	1 962	2 327
o/w imputed rents	*430*	*455*	*487*	*488*	*520*
o/w public services	*682*	*689*	*782*	*812*	*1 108*
o/w financial services	*89*	*88*	*82*	*81*	*95*
Actionable exemption gap	**463**	**607**	**568**	**580**	**603**
Actionable policy gap	**626**	**753**	**726**	**736**	**793**
C-efficiency	**53.72%**	**57.39%**	**58.65%**	**57.52%**	**55.95%**

Figure 52: LV: VAT policy gap, rate gap, and exemption gap



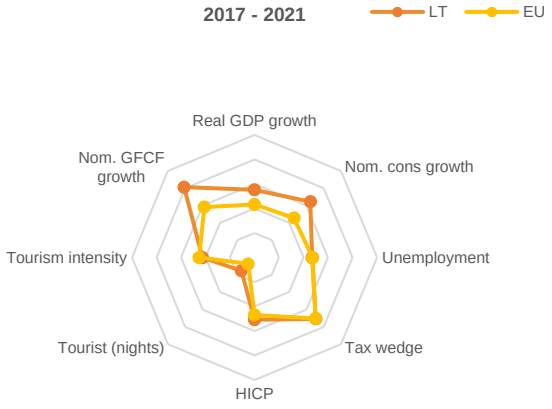
Source: own calculation, download underlying data.

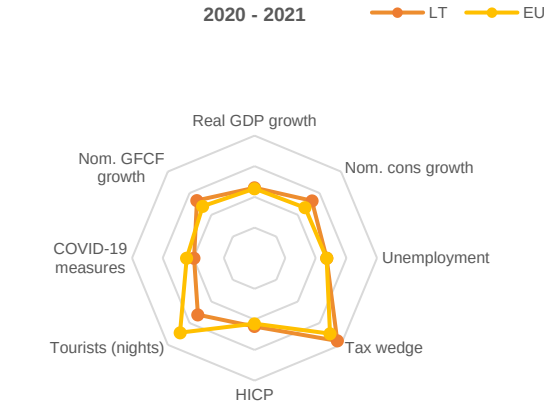
Lithuania

Economic and policy context

Lithuania was one of the two Member States that did not record a recession in 2020. Despite this, the rebound from the slowdown in 2021 was relatively sharp (6 percent increase of GDP in real terms). These developments are in line with the structure of the economy, which is relatively weakly dependent on tourist arrivals. Thus, a slight decrease in the intensity of COVID-19 containment measures did not stop the country's fast economic growth. The VTTL was driven by the growth of the consumption expenditures of private households and NPISH (+13.0 percent in nominal terms). GFCF increased by 13.2 percent. Inflation, measured as change in the HICP, amounted to 4.6 percent.

The fast growth of the economy and components of the VTTL were also observed in the longer time perspective. Between 2017 and 2021, GDP growth was over 15 percent. Household and NPISH final consumption increased by 24.5 percent and GFCF went up by 41.3 percent. The impact of tourism on the economy was low, thus the only partial revival of the tourism industry and related sectors did not weigh strongly on the development of the economy in recent years. Overall, the economic conditions between 2017 and 2021 were rather supportive to the decrease of the VAT compliance gap in Lithuania.





Highlights

- As of July 2021, Lithuania decreased the VAT rate on catering services, selected entertainment, and sport-related services (to 9 percent). However, the economy-wide effective VAT rate went up.
- In 2021, the VAT compliance gap in Lithuania fell by 4.2 pp, down to 14.5 percent of the VTTL. This paints a clear picture of steadily improving tax compliance over the last 5 years. Based on fast estimates, this trend was continued in 2022.
- The significant decrease in the compliance and policy gaps in 2021 are marked by an increase in the C-efficiency by ca. 2.6 pp up to ca. 59 percent.

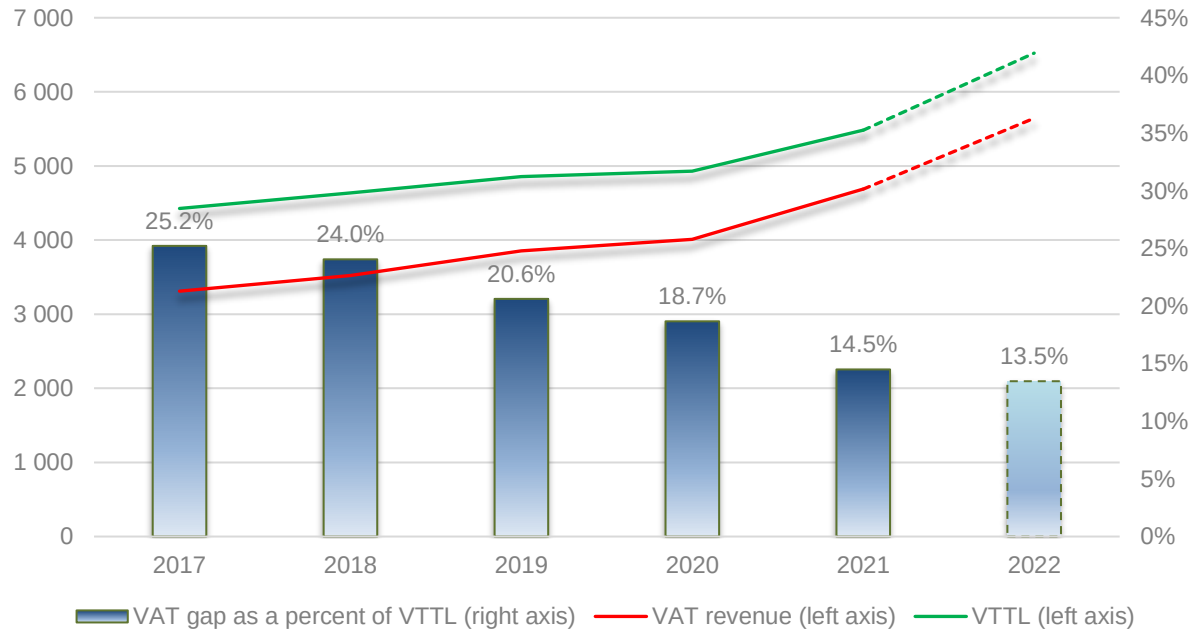
	2017-2021		2020-2021	
Variable	**LT**	**EU**	**LT**	**EU**
GDP (real, % change)	15.3	3.4	6.0	5.4
HH/NPISH cons. (nom)	24.5	5.7	13.0	6.7
Unemployment rate	7.0	7.4	7.1	7.1
Tax wedge	30.8	30.4	36.4	29.7
HICP	10.9	7.0	4.6	2.9
Tourist nights (% change)	-24.7	-32.6	12.4	28.8
Tourist nights (average)	2.5	5.2	-	-
COVID-19 measures (change)	-	-	-0.5	4.3
GFCF (nom, % change)	41.3	18.1	13.2	8.0

Source: Euorstat

Table 35: LT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**4 426**	**4 637**	**4 857**	**4 929**	**5 482**	*6 523*
o/w liability on household final consumption	3 664	3 846	3 995	3 915	4 415	
o/w liability on gov. and NPISH final consumption	46	43	52	54	61	
o/w liability on intermediate consumption	439	456	499	531	617	
o/w liability on GFCF	526	570	631	752	732	
o/w net adjustments	- 249	- 279	- 319	- 323	- 343	
VAT revenue	**3 310**	**3 522**	**3 856**	**4 009**	**4 688**	*5 644*
VAT compliance gap	**1 116**	**1 115**	**1 001**	**920**	**795**	
VAT compliance gap (percent of VTTL)	**25.2%**	**24.0%**	**20.6%**	**18.7%**	**14.5%**	*13.5%*
VAT compliance gap change since 2017					**-10.7 pp**	

Figure 53: LT: VAT compliance gap, VAT revenue, and VTTL[39]



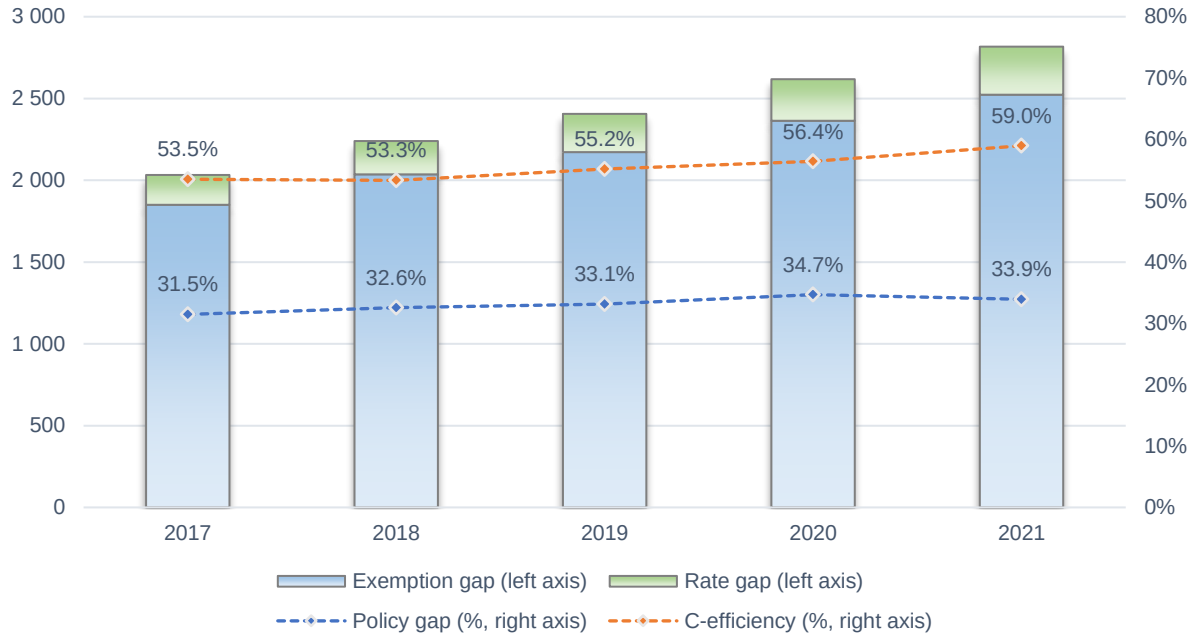
Source: own calculation, download underlying data.

[39] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 36: LT: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**2 033**	**2 240**	**2 406**	**2 618**	**2 817**
Rate gap	182	204	234	254	294
Exemption gap	1 850	2 036	2 172	2 364	2 523
o/w imputed rents	*291*	*312*	*335*	*338*	*381*
o/w public services	*894*	*980*	*1 105*	*1 200*	*1 452*
o/w financial services	*108*	*129*	*138*	*131*	*134*
Actionable exemption gap	**557**	**614**	**595**	**696**	**557**
Actionable policy gap	**739**	**818**	**828**	**950**	**850**
C-efficiency	**53.51%**	**53.32%**	**55.15%**	**56.40%**	**58.96%**

Figure 54: LT: VAT policy gap, rate gap, and exemption gap



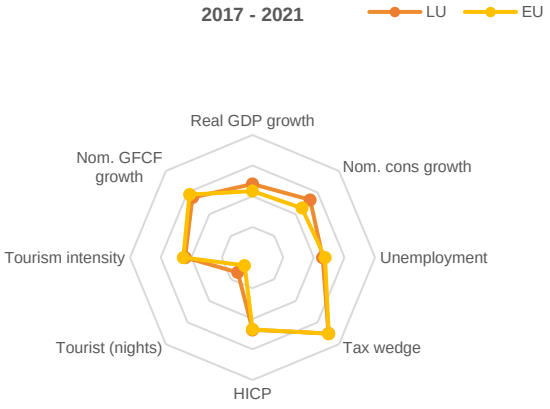
Source: own calculation, download underlying data.

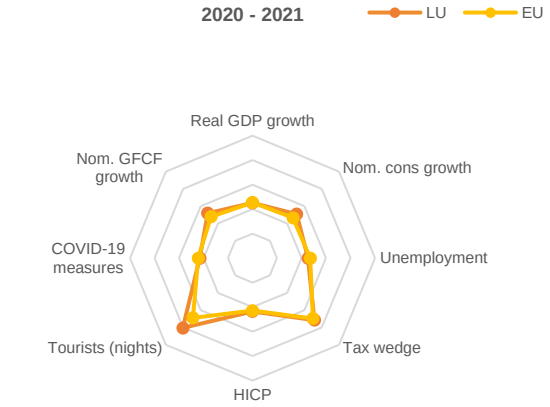
Luxembourg

Economic and policy context

The developments in the economy of Luxembourg in 2021 resemble the EU-average. The economy increased by 5.1 percent following a relatively mild recession in 2020 (-0.8 percent). The intensity of COVID-19 measures increased slightly in 2021, which did not hamper the strong rebound of 40.5 percent in the number of nights spent by tourists. The growth of nominal household and NPISH consumption was relatively strong (+10.9 percent). GFCF increased by 11.9 percent. Inflation, measured as change in the HICP, was comparably high at 3.5 percent and above the EU average.

Between 2017 and 2021, the economic conditions in Luxembourg were more favourable than on average in the EU. GDP increased by 8 percent in real terms. The main components of the VTTL, household and NPISH final consumption, and GFCF increased by 13.3 percent and 15.5 percent, respectively. The relatively mild impact of the COVID-19 crisis was likely partially caused by the relatively low contribution of the tourism industry to GDP.





Highlights

- In 2021, the VAT compliance gap fell by 3.5 pp and was estimated at 1.6 percent of the VTTL.
- As there is some uncertainty around the accuracy of fast estimates for 2022, they are not presented at this stage.
- As a result of the low policy and compliance gaps as well as relatively large share of the VTTL generated through intermediate consumption liability, C-efficiency in Luxembourg was the highest in the EU (79 percent in 2021).

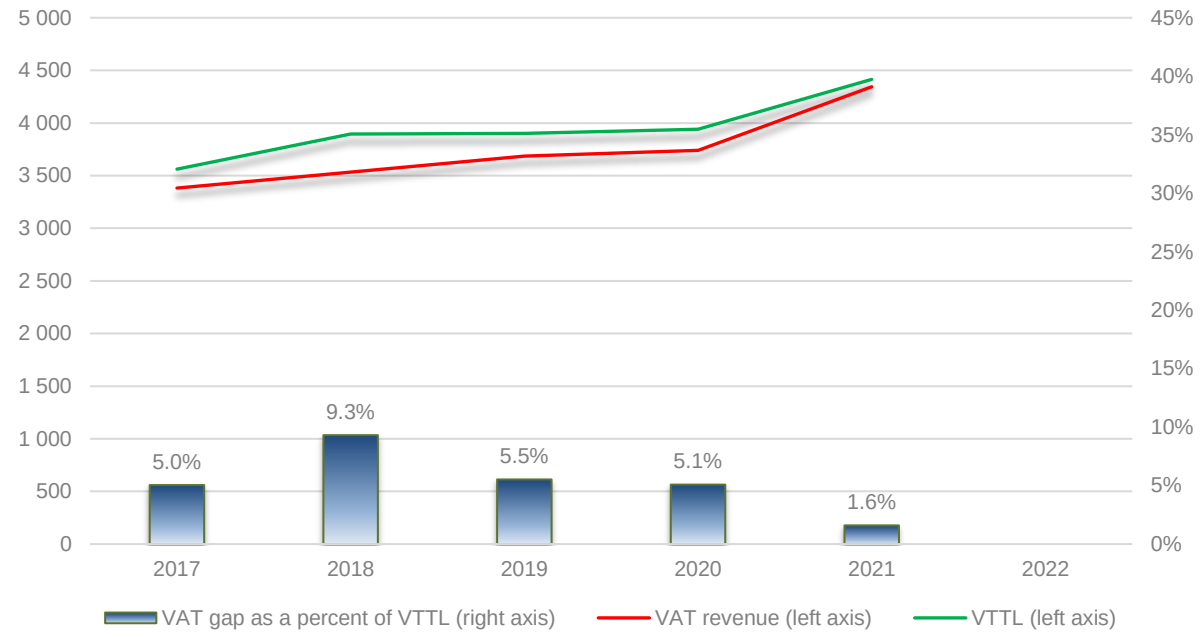
	2017-2021		2020-2021	
Variable	**LU**	**EU**	**LU**	**EU**
GDP (real, % change)	8.0	3.4	5.1	5.4
HH/NPISH cons. (nom)	13.3	5.7	10.9	6.7
Unemployment rate	5.8	7.4	5.3	7.1
Tax wedge	30.2	30.4	31.4	29.7
HICP	7.3	7.0	3.5	2.9
Tourist nights (% change)	-26.3	-32.6	40.5	28.8
Tourist nights (average)	4.0	5.2	-	-
COVID-19 measures (change)	-	-	3.1	4.3
GFCF (nom, % change)	15.5	18.1	11.9	8.0

Source: Euorstat

Table 37: LU: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**3 561**	**3 896**	**3 901**	**3 941**	**4 414**	*X*
o/w liability on household final consumption	1 450	1 540	1 572	1 432	1 609	
o/w liability on gov. and NPISH final consumption	43	90	38	82	88	
o/w liability on intermediate consumption	1 189	1 384	1 471	1 581	1 659	
o/w liability on GFCF	580	565	462	567	612	
o/w net adjustments	300	317	358	280	446	
VAT revenue	**3 382**	**3 534**	**3 685**	**3 741**	**4 344**	*X*
VAT compliance gap	**180**	**363**	**215**	**200**	**70**	
VAT compliance gap (percent of VTTL)	**5.0%**	**9.3%**	**5.5%**	**5.1%**	**1.6%**	*X*
VAT compliance gap change since 2017					**-3.4 pp**	

Figure 55: LU: VAT compliance gap, VAT revenue, and VTTL

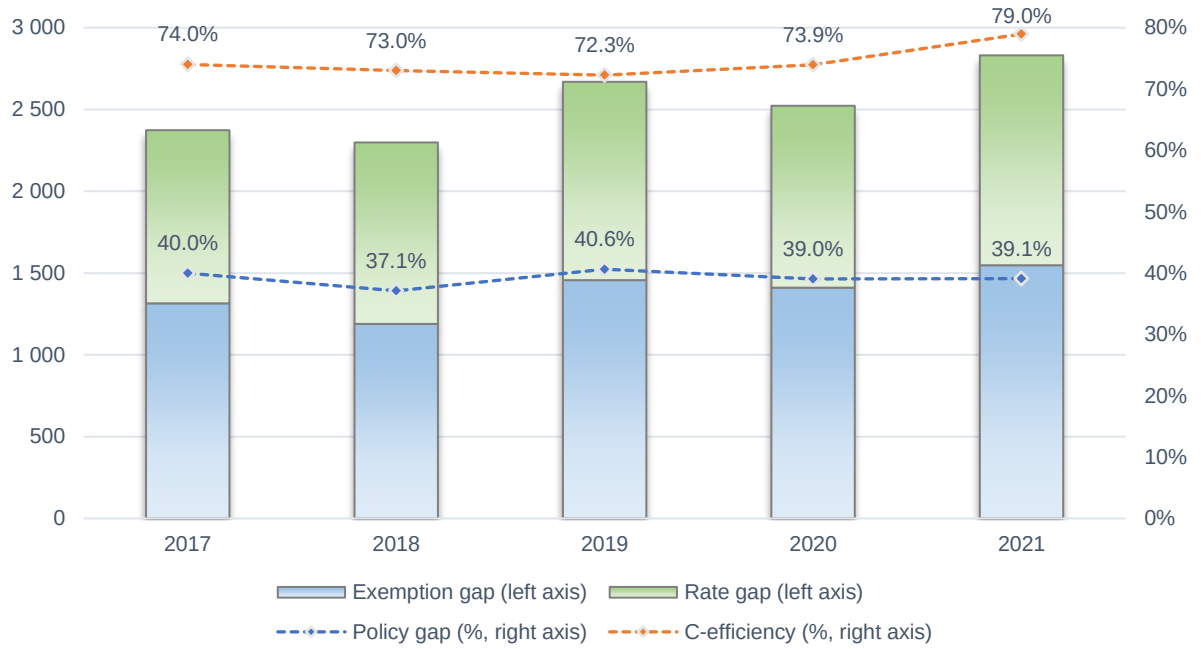


Source: own calculation, download underlying data.

Table 38: LU: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**2 374**	**2 299**	**2 669**	**2 523**	**2 831**
Rate gap	1 059	1 109	1 212	1 112	1 283
Exemption gap	1 315	1 189	1 457	1 411	1 548
o/w imputed rents	*476*	*487*	*503*	*516*	*553*
o/w public services	*1 330*	*1 391*	*1 623*	*1 670*	*1 946*
o/w financial services	*- 797*	*- 915*	*- 958*	*-1 043*	*-1 172*
Actionable exemption gap	**307**	**226**	**290**	**268**	**220**
Actionable policy gap	**1 365**	**1 335**	**1 502**	**1 380**	**1 503**
C-efficiency	**74.03%**	**73.01%**	**72.27%**	**73.94%**	**78.96%**

Figure 56: LU: VAT policy gap, rate gap, and exemption gap



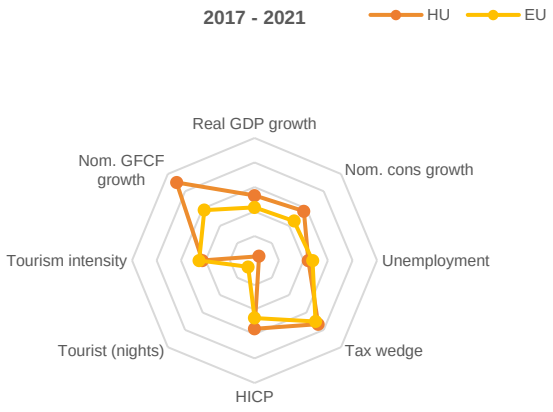
Source: own calculation, download underlying data.

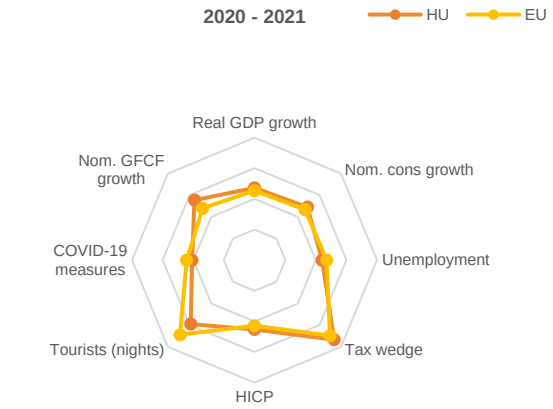
Hungary

Economic and policy context

Hungary saw a strong economic recovery in 2021 with a real GDP growth rate of 7.2 percent. As a result, GDP recorded in 2021 exceeded the 2019 pre-COVID-19 value by 2.4 percent. The intensity of COVID-19 measures remained almost unchanged in 2021 and the number of nights spent by tourists saw a moderate rebound of 19 percent. The growth of nominal consumption expenditures of households and NPISH of 9 percent and a fast GFCF incline (15.5 percent) led to a sharp increase in the VTTL. Inflation, measured as change in the HICP, was 5.2 percent, i.e., 2.3 pp above the EU average.

Looking at 2017-2021, the economic situation was favourable for sealing the gaps. The economy increased by 13.1 percent in real terms. Relatively high inflation and real growth led to significant hikes in the nominal aggregates. Importantly, GFCF, which increased by over 50 percent, was a solid contributor to GDP growth. The post-COVID-19 recovery in the number of nights spent by tourists in hotel establishments was still very incomplete (-45.0 percent compared to 2017). Yet, the economy of Hungary, with a tourism intensity of only 2.7 nights per inhabitant, is relatively less dependent on the tourism and hospitality sectors which were strongly affected by the COVID-19 crisis.





Highlights

- As of 2021, Hungary reduced the VAT rate applicable to the sale of residential properties (up to 150 sqm) from 27 to 5 percent.
- The compliance gap in Hungary has followed a steady and steep decline since 2017, reaching as low as 4.4 percent of the VTTL in 2021. Overall, the change in the compliance gap between 2017 and 2021 amounted to almost 10 pp. Yet, the fast estimates for 2022 show that the gap in 2022 might increase.
- Despite the increase in the policy gap between 2017 and 2021, the increase in compliance led to a substantial improvement of the C-efficiency (from 53.7 percent in 2017 to 60.1 percent in 2021).

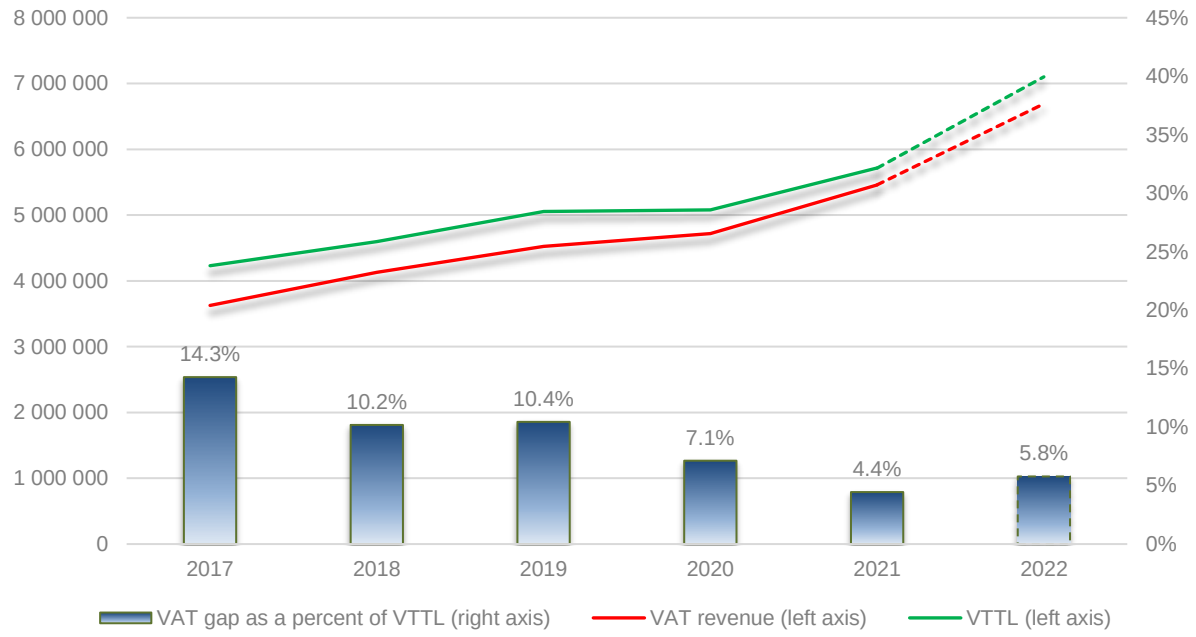
	2017-2021		2020-2021	
Variable	**HU**	**EU**	**HU**	**EU**
GDP (real, % change)	13.1	3.4	7.2	5.4
HH/NPISH cons. (nom)	16.9	5.7	9.0	6.7
Unemployment rate	3.8	7.4	4.1	7.1
Tax wedge	33.5	30.4	33.5	29.7
HICP	15.8	7.0	5.2	2.9
Tourist nights (% change)	-45.0	-32.6	19.0	28.8
Tourist nights (average)	2.7	5.2	-	-
COVID-19 measures (change)	-	-	0.8	4.3
GFCF (nom, % change)	50.1	18.1	15.5	8.0

Source: Euorstat

Table 39: HU: VAT compliance gaps, VAT receipts, composition of VTTL (HUF million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**4 230 389**	**4 597 782**	**5 054 865**	**5 079 051**	**5 714 264**	*7 101 701*
o/w liability on household final consumption	2 946 099	3 042 548	3 300 236	3 148 107	3 552 494	
o/w liability on gov. and NPISH final consumption	130 509	150 996	197 738	251 972	283 793	
o/w liability on intermediate consumption	581 986	650 313	709 368	764 951	869 770	
o/w liability on GFCF	512 717	712 525	825 792	902 596	990 013	
o/w net adjustments	59 079	41 400	21 731	11 425	18 193	
VAT revenue	**3 626 566**	**4 129 537**	**4 526 757**	**4 717 048**	**5 460 243**	*6 691 200*
VAT compliance gap	**603 824**	**468 245**	**528 108**	**362 003**	**254 021**	
VAT compliance gap (percent of VTTL)	**14.3%**	**10.2%**	**10.4%**	**7.1%**	**4.4%**	*5.8%*
VAT compliance gap change since 2017					**-9.8 pp**[40]	

Figure 57: HU: VAT compliance gap, VAT revenue, and VTTL[41]



Source: own calculation, download underlying data.

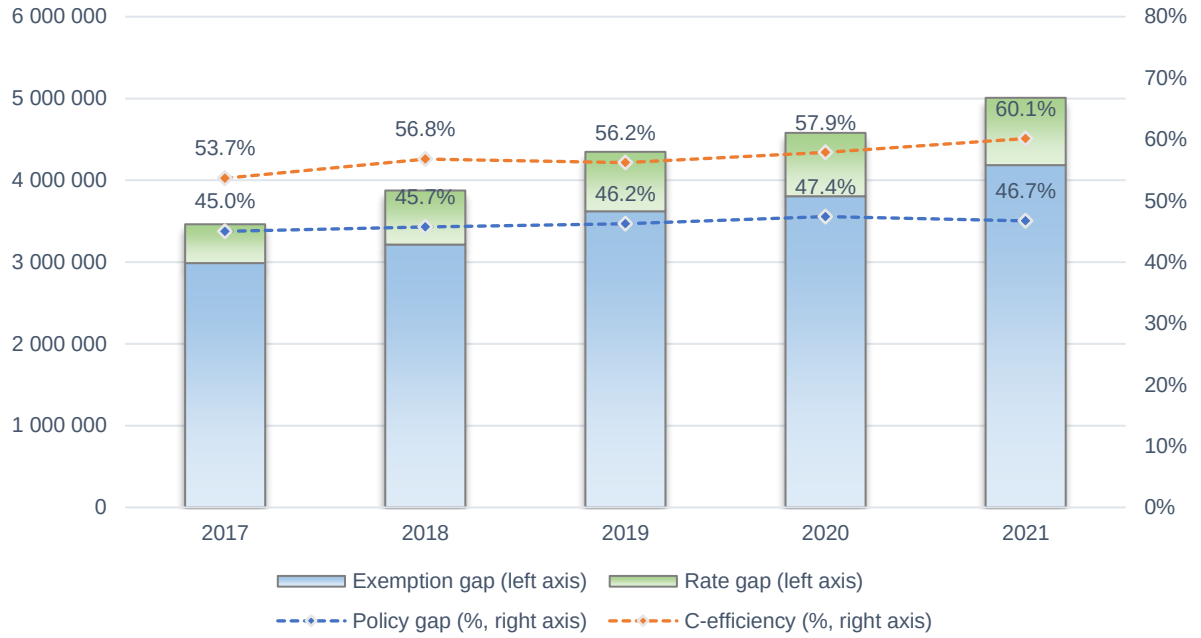
[40] *Numbers do not add up due to rounding.*

[41] *The level of confidence around estimates for 2021 is higher as they are based simplified methodology and more aggregate data.*

Table 40: HU: VAT policy gap and its components (HUF million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**3 462 444**	**3 874 971**	**4 347 895**	**4 579 978**	**5 008 257**
Rate gap	475 023	661 116	726 914	774 894	823 014
Exemption gap	2 987 421	3 213 855	3 620 981	3 805 084	4 185 243
o/w imputed rents	*637* 596	*728* 190	*850* 096	*903* 957	*1 013* 600
o/w public services	*1 448* 037	*1 441* 032	*1 547* 762	*1 623* 405	*1 817* 667
o/w financial services	*257 040*	*260 887*	*290 962*	*318 271*	*357 348*
Actionable exemption gap	**644 748**	**783 746**	**932 162**	**959 451**	**996 627**
Actionable policy gap	**1 119 771**	**1 444 862**	**1 659 076**	**1 734 344**	**1 819 641**
C-efficiency	**53.68%**	**56.76%**	**56.21%**	**57.88%**	**60.14%**

Figure 58: HU: VAT policy gap, rate gap, and exemption gap



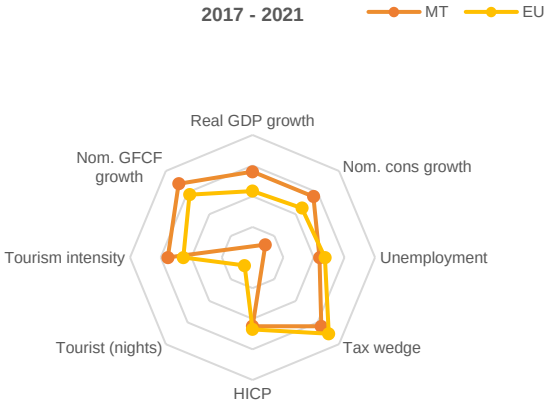
Source: own calculation, download underlying data.

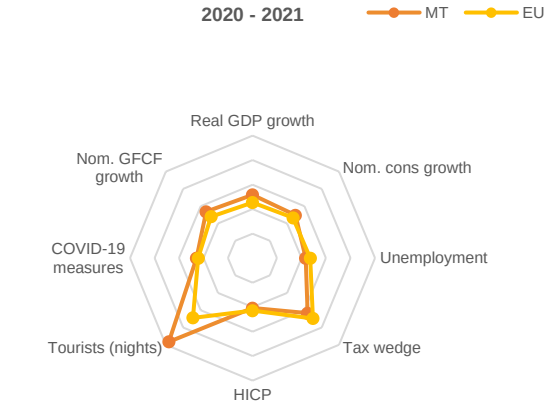
Malta

Economic and policy context

Similar to the other MS economies where there is a substantial contribution of the tourism and hospitality industries to GDP, Malta saw large shifts in its GDP after the outbreak of the COVID-19 pandemic. In 2020, Maltese GDP fell by -8.6 percent, whereas in 2021 it rebounded, overshooting the 2019 levels. The economy increased by 11.7 percent despite the slight increase in the intensity of the COVID-19 containment measures. The main component of the VTTL, household and NPISH consumption, went up by 9.5 percent in nominal terms. GFCF increased by 13.7 percent. Inflation, measured as change in the HICP, was below 1 percent and one of the lowest in the EU.

Between 2017 and 2021, GDP growth in Malta amounted to 16.1 percent. This was accompanied by a modest increase in prices (+4.8 percent). Strong growth of household and NPISH consumption (16.3 percent in nominal terms) and GFCF (+28.2 percent) led to a large increase in the VTTL. At the same time, the number of nights spent in hotels and other tourist establishments was over 50 percent below the 2017 value. As Malta has a very high tourism intensity with 15.4 nights per inhabitant per year, the COVID-19 pandemic has surely hampered a potential sharper revival in 2021.





Highlights

- After a large increase of the VAT compliance gap in 2019, the gap has been steadily decreasing and reached 25.7 percent of the VTTL in 2021. According to fast estimates, this negative trend has likely continued in 2022.
- C-efficiency in Malta was high (ca. 65 percent in 2021) and substantially above the EU average. This was largely caused by the relatively low policy gap, which was mainly driven the large role of the gambling sectors providing their electronic services abroad and no right to deduct input VAT by these providers. As a result, large sums of hidden tax increased overall VAT revenue compared to the scenario assuming the taxability of output and the deductibility of intermediate inputs.

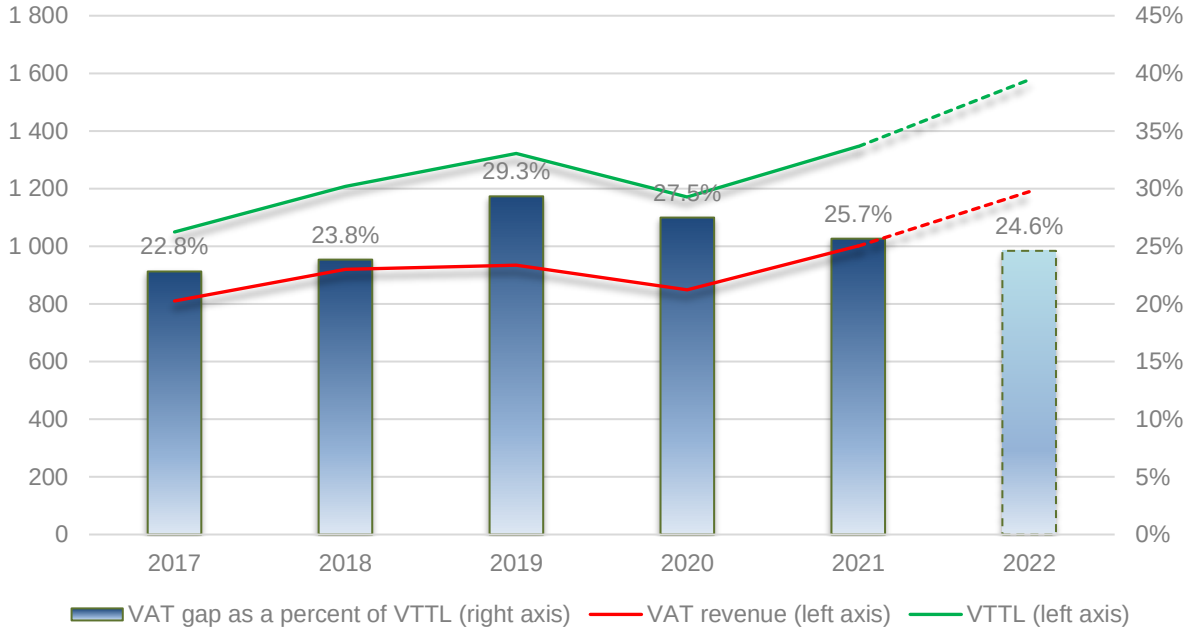
	2017-2021		2020-2021	
Variable	**MT**	**EU**	**MT**	**EU**
GDP (real, % change)	16.1	3.4	11.7	5.4
HH/NPISH cons. (nom)	16.3	5.7	9.5	6.7
Unemployment rate	3.8	7.4	3.4	7.1
Tax wedge	23.5	30.4	23.6	29.7
HICP	4.8	7.0	0.7	2.9
Tourist nights (% change)	-51.8	-32.6	56.6	28.8
Tourist nights (average)	15.4	5.2	-	-
COVID-19 measures (change)	-	-	5.8	4.3
GFCF (nom, % change)	28.2	18.1	13.7	8.0

Source: Euorstat

Table 41: MT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**1 050**	**1 208**	**1 322**	**1 171**	**1 346**	*1 578*
o/w liability on household final consumption	588	642	688	483	567	
o/w liability on gov. and NPISH final consumption	53	58	64	75	82	
o/w liability on intermediate consumption	311	378	439	492	557	
o/w liability on GFCF	71	102	114	106	116	
o/w net adjustments	27	28	17	15	24	
VAT revenue	**810**	**920**	**934**	**849**	**1 001**	*1 190*
VAT compliance gap	**240**	**288**	**388**	**322**	**345**	
VAT compliance gap (percent of VTTL)	**22.8%**	**23.8%**	**29.3%**	**27.5%**	**25.7%**	*24.6%*
VAT compliance gap change since 2017					**+2.8 pp**	

Figure 59: MT: VAT compliance gap, VAT revenue, and VTTL[42]



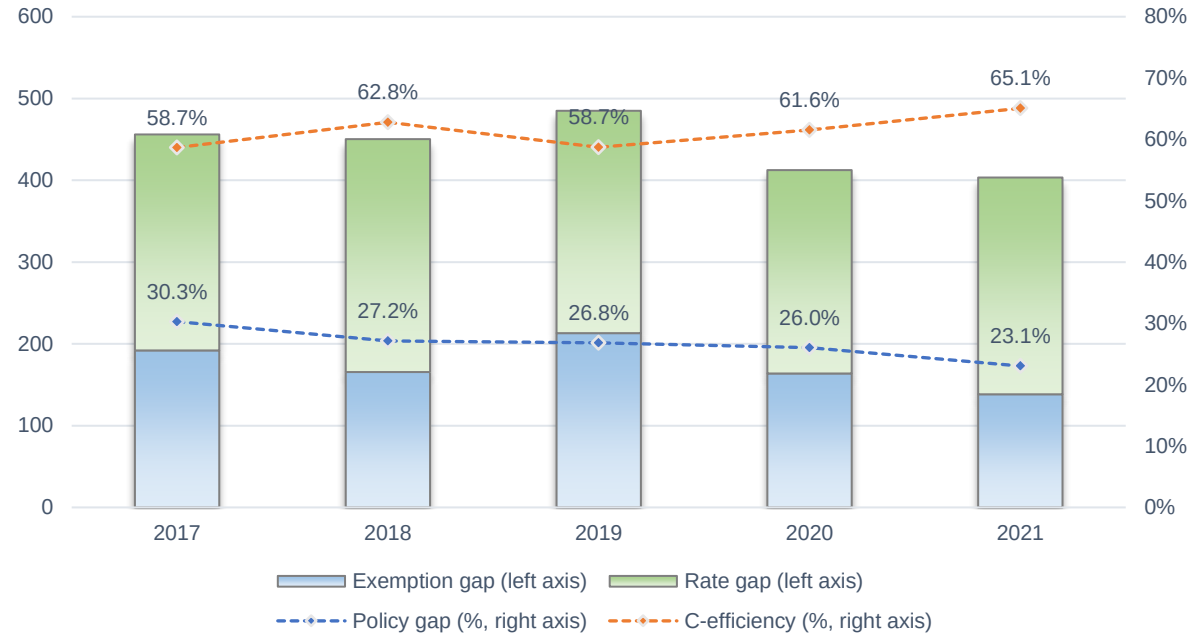
Source: own calculation, download underlying data.

[42] *The level of confidence around estimates for 2021 is higher as they are based simplified methodology and more aggregate data.*

Table 42: MT: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**456**	**450**	**485**	**412**	**403**
Rate gap	264	285	272	249	265
Exemption gap	192	166	213	164	138
o/w imputed rents	*86*	*87*	*95*	*102*	*104*
o/w public services	*188*	*185*	*213*	*245*	*283*
o/w financial services	*12*	*15*	*9*	*14*	*18*
Actionable exemption gap	**- 93**	**- 123**	**- 104**	**- 198**	**- 267**
Actionable policy gap	**171**	**162**	**168**	**51**	**- 2**
C-efficiency	**58.68%**	**62.79%**	**58.72%**	**61.56%**	**65.07%**

Figure 60: MT: VAT policy gap, rate gap, and exemption gap



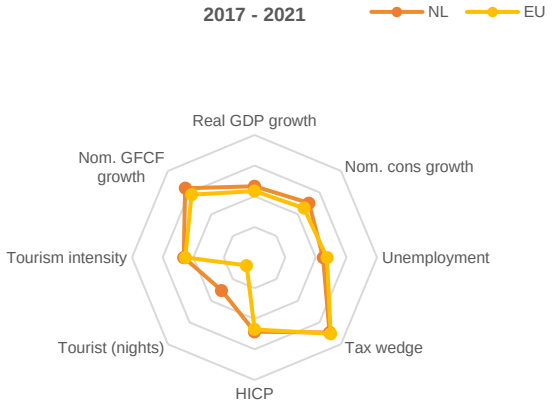
Source: own calculation, download underlying data.

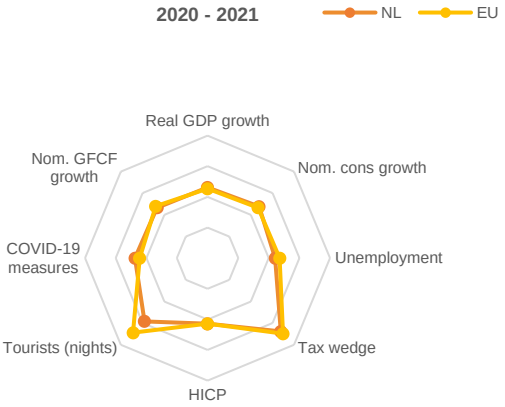
Netherlands

Economic and policy context

The Netherlands saw a strong economic growth in 2021 with a real GDP growth rate of 6.2 percent – substantially higher than the contraction observed in 2020 (-3.9 GDP growth in 2020). The economic recovery was accompanied by the decline of the unemployment rate down to 4.2 percent. The intensity of COVID-19 measures increased somewhat in 2021, while the number of nights spent by tourists moderately rebounded by 18.4 percent. The growth of household and NPISH consumption was ca. 7.6 percent whereas GFCF increased by 6.6 percent. The year-over-year change in the HICP was close to the EU average and reached 2.8 percent.

Between 2017 and 2021, the economy of the Netherlands increased by 6.5 percent, which was somewhat above the EU average. Similarly, the increase in consumer prices was higher than the average in the EU. In nominal terms, the growth of household and NPISH final consumption was slower than nominal GDP growth, whereas GFCF was a substantial driver of GDP growth. The COVID-19 restrictions did not weigh on GDP growth as strongly as in many other Member States. The recovery in the number of nights spent by tourists in hotel establishments was almost complete (-9.5 percent compared to 2017).





Highlights

- In 2021, the VAT compliance gap in the Netherlands fell by 4.2 pp, down to -0.2 percent of the VTTL. Although, a negative tax gap is practically impossible, the estimation is burdened with some statistical and measurement errors, which in cases where non-compliance is close to 0 may lead to negative values. Based on fast estimates, the VAT compliance gap in 2022 should return to levels closer to that observed in 2020.
- The policy gap in the Netherlands was relatively stable with exception of 2019 when the statutory reduced rate was increased from 6 to 9 percent. C-efficiency has been steadily increasing since 2017.

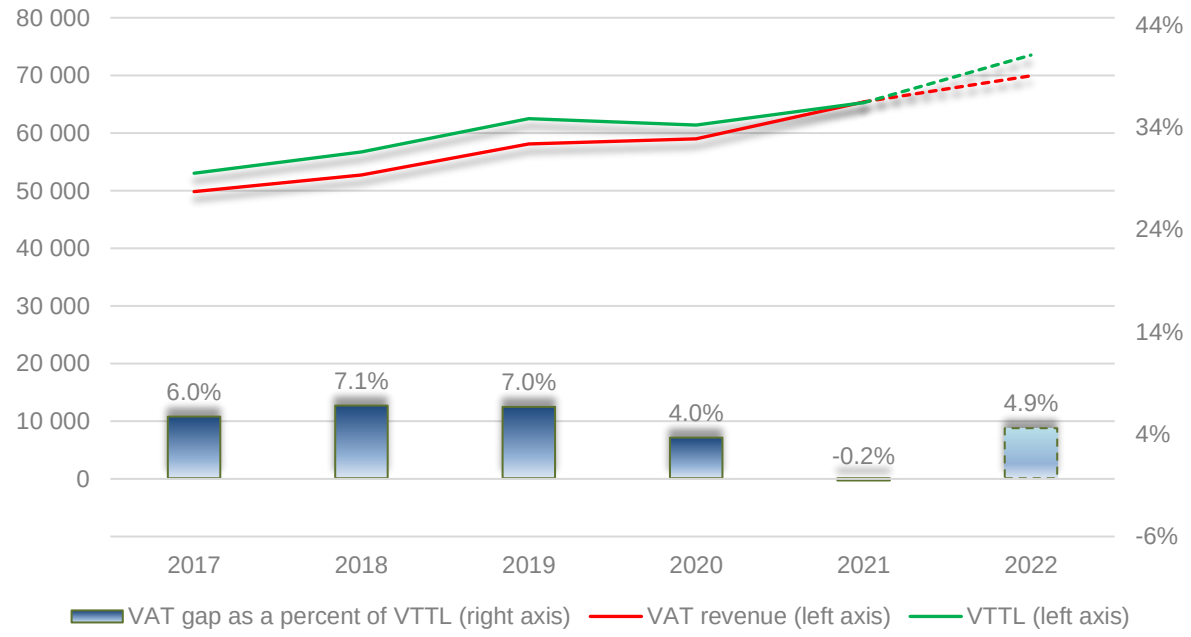
	2017-2021		2020-2021	
Variable	**NL**	**EU**	**NL**	**EU**
GDP (real, % change)	6.5	3.4	6.2	5.4
HH/NPISH cons. (nom)	10.3	5.7	7.6	6.7
Unemployment rate	4.9	7.4	4.2	7.1
Tax wedge	29.3	30.4	27.7	29.7
HICP	8.5	7.0	2.8	2.9
Tourist nights (% change)	-9.5	-32.6	18.4	28.8
Tourist nights (average)	6.2	5.2	-	-
COVID-19 measures (change)	-	-	7.4	4.3
GFCF (nom, % change)	24.0	18.1	6.6	8.0

Source: Euorstat

Table 43: NL: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**53 024**	**56 740**	**62 468**	**61 407**	**65 254**	*73 519*
o/w liability on household final consumption	27 205	28 468	31 621	29 717	32 158	
o/w liability on gov. and NPISH final consumption	568	586	752	771	841	
o/w liability on intermediate consumption	14 220	15 857	17 056	17 504	17 968	
o/w liability on GFCF	10 487	11 272	12 392	12 766	13 578	
o/w net adjustments	545	556	647	648	709	
VAT revenue	**49 833**	**52 712**	**58 115**	**58 971**	**65 400**	*69 928*
VAT compliance gap	**3 191**	**4 028**	**4 353**	**2 436**	**- 146**	
VAT compliance gap (percent of VTTL)	**6.0%**	**7.1%**	**7.0%**	**4.0%**	**-0.2%**	*4.9%*
VAT compliance gap change since 2017					**-6.2 pp**	

Figure 61: NL: VAT compliance gap, VAT revenue, and VTTL[43]



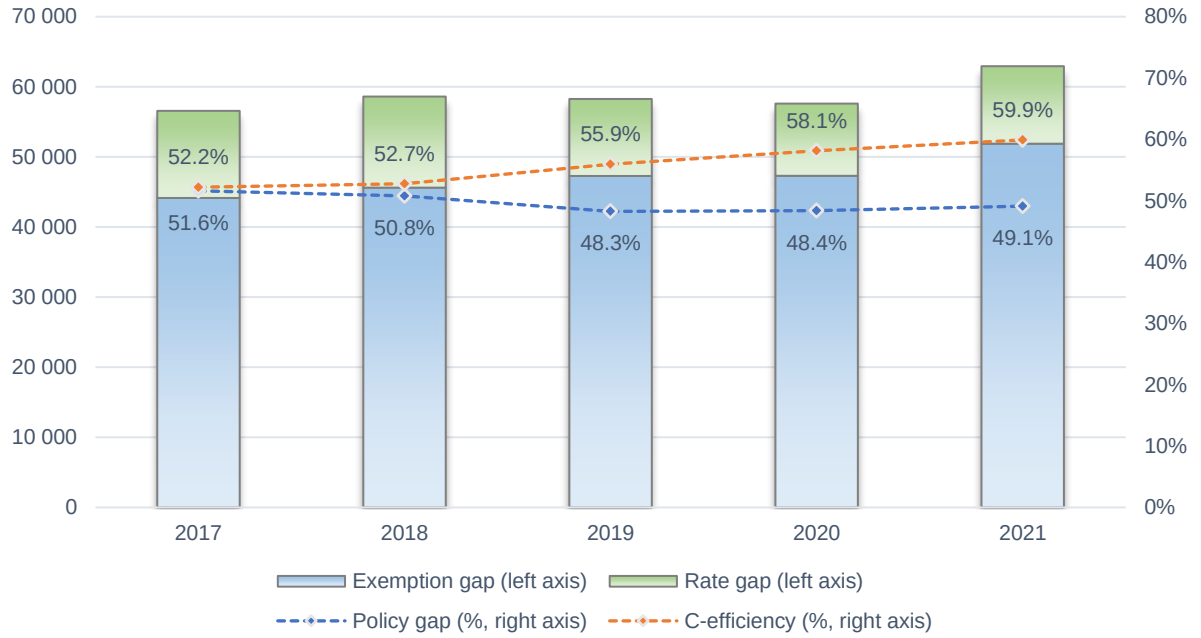
Source: own calculation, download underlying data.

[43] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 44: NL: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**56 571**	**58 611**	**58 268**	**57 610**	**62 942**
Rate gap	12 426	12 989	10 983	10 301	11 053
Exemption gap	44 144	45 622	47 285	47 309	51 889
o/w imputed rents	*7 741*	*8 104*	*8 497*	*8 758*	*9 265*
o/w public services	*27 616*	*28 788*	*30 310*	*30 511*	*33 552*
o/w financial services	*6 881*	*6 136*	*6 230*	*5 843*	*6 242*
Actionable exemption gap	**1 907**	**2 593**	**2 248**	**2 197**	**2 831**
Actionable policy gap	**14 333**	**15 582**	**13 231**	**12 498**	**13 883**
C-efficiency	**52.20%**	**52.75%**	**55.93%**	**58.15%**	**59.91%**

Figure 62: NL: VAT policy gap, rate gap, and exemption gap



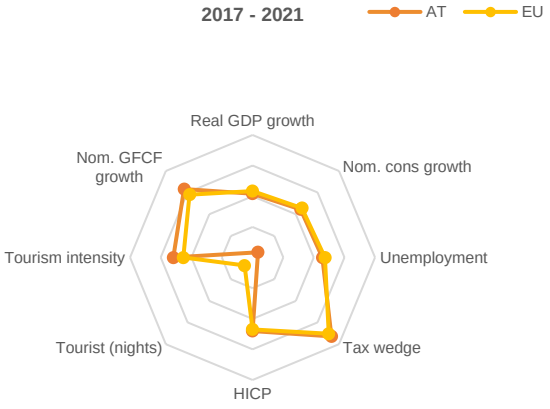
Source: own calculation, download underlying data.

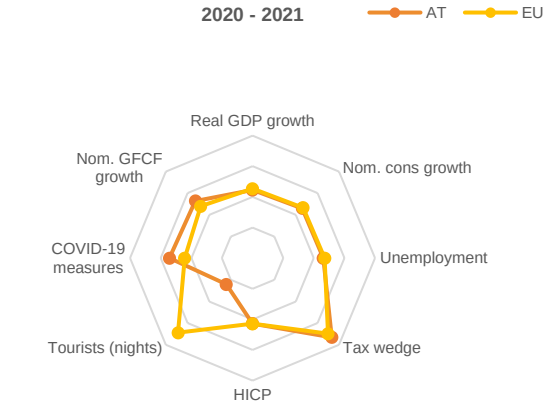
Austria

Economic and policy context

With 4.6 percent GDP growth in 2021, the economy of Austria had not yet reached its 2019 pre-COVID-19 level. This has been partially caused by a further increase in the intensity of COVID-19 measures in the first quarter of 2021. These strict lock-down measures in the beginning of 2021 resulted in a strong decline of foreign tourist stays in the winter 2020/21 season leading to a strong decline in the nights spent by tourists (of -15.7 percent). Inflation, measured as the total change in the HICP, is at 2.8 for 2021 and broadly in line with the average in the EU-27. Nominal consumption expenditures of households and NPISH went up by 5.9 percent whereas GFCF increased by 12.8 percent, leading to the rebound of the VTTL.

During 2017-2021, GDP growth in Austria was rather sluggish (+1.7 percent over four years). GDP increased only modestly despite the substantial hike in GFCF (23.2 percent in nominal terms). Price inflation was above the EU average as the change in prices over the period was 8 percent. Importantly, Austria has a very high tourism intensity with 11.8 nights per inhabitant for the period 2017 to 2021. The partial recovery in tourist arrivals has likely hampered the growth rates of the VTTL between 2017 and 2021.





Highlights

- Significant changes to VAT rate matrix introduced in 2020 have been maintained throughout 2021. This includes the reduction of the VAT rate for non-alcoholic beverages (from 20 percent to 10 percent) as well as hospitality and selected cultural services (from 10 percent to 5 percent).
- This resulted in stabilization of the policy gap at a new level – in 2021 it amounted to 49.1 percent of notional ideal revenue, compared to around 45-46 percent in years preceding the shift.
- After a relatively stable period between 2017 and 2020, the VAT compliance gap in Austria fell in 2021 by 3.8 pp and reached 2.8 percent of the VTTL. The increase in compliance was accompanied by relatively slow economic growth and a decrease in the economy-wide effective rate. As a result, Austria is one of few countries where the VTTL in 2021 was still lower than it was in 2019 (and also 2018).

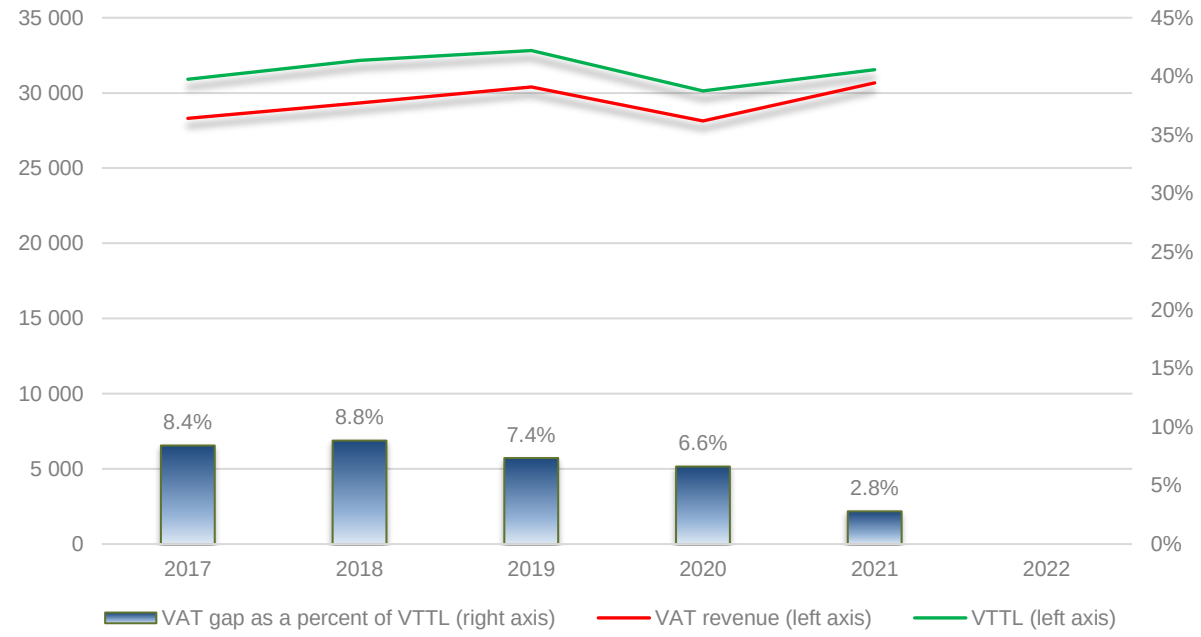
	2017-2021		2020-2021	
Variable	**AT**	**EU**	**AT**	**EU**
GDP (real, % change)	1.7	3.4	4.6	5.4
HH/NPISH cons. (nom)	4.4	5.7	5.9	6.7
Unemployment rate	5.6	7.4	6.2	7.1
Tax wedge	32.9	30.4	33.2	29.7
HICP	8.0	7.0	2.8	2.9
Tourist nights (% change)	-44.9	-32.6	-15.7	28.8
Tourist nights (average)	11.8	5.2	-	-
COVID-19 measures (change)	-	-	14.3	4.3
GFCF (nom, % change)	23.2	18.1	12.8	8.0

Source: Euorstat

Table 45: AT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**30 909**	**32 169**	**32 819**	**30 133**	**31 551**	*X*
o/w liability on household final consumption	20 658	21 358	21 789	19 055	19 078	
o/w liability on gov. and NPISH final consumption	958	1 486	1 533	1 556	1 697	
o/w liability on intermediate consumption	4 317	4 382	4 571	4 708	5 391	
o/w liability on GFCF	3 437	3 416	3 524	3 611	3 853	
o/w net adjustments	1 539	1 528	1 403	1 203	1 532	
VAT revenue	**28 304**	**29 323**	**30 405**	**28 136**	**30 668**	*X*
VAT compliance gap	**2 605**	**2 846**	**2 413**	**1 997**	**883**	
VAT compliance gap (percent of VTTL)	**8.4%**	**8.8%**	**7.4%**	**6.6%**	**2.8%**	*X*
VAT compliance gap change since 2017					**-5.6 pp**	

Figure 63: AT: VAT compliance gap, VAT revenue, and VTTL

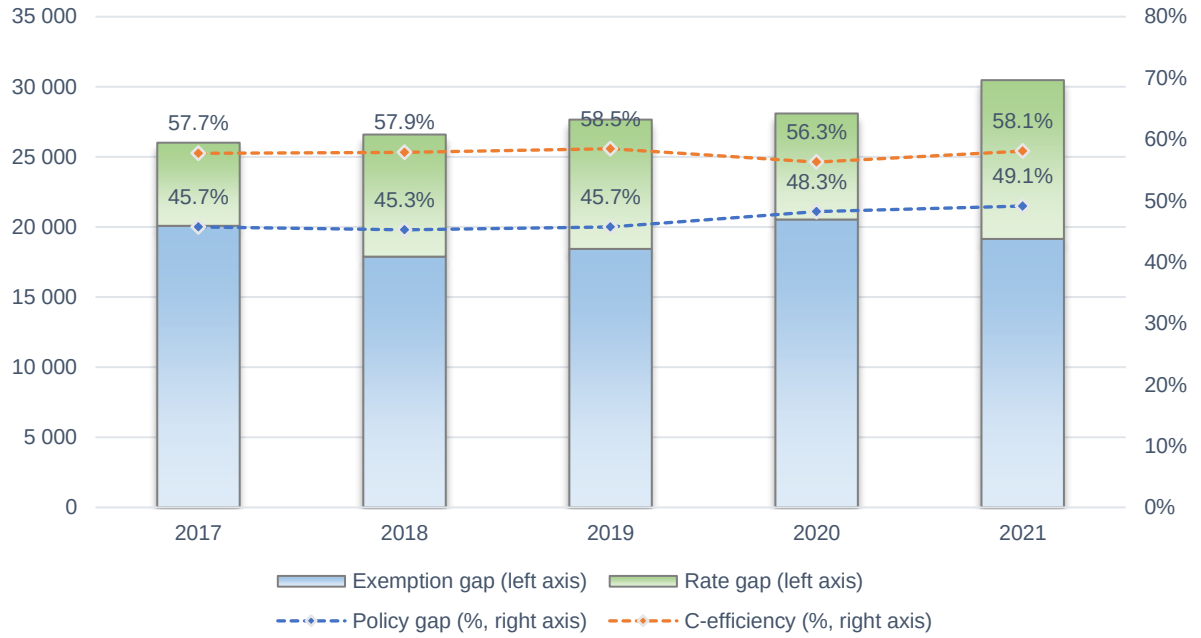


Source: own calculation, download underlying data.

Table 46: AT: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**26 015**	**26 597**	**27 661**	**28 098**	**30 477**
Rate gap	5 929	8 709	9 221	7 561	11 325
Exemption gap	20 086	17 888	18 440	20 537	19 152
o/w imputed rents	*4 227*	*4 380*	*4 498*	*4 662*	*4 687*
o/w public services	*10 858*	*11 046*	*11 469*	*11 713*	*12 979*
o/w financial services	*1 500*	*1 524*	*1 601*	*1 539*	*1 584*
Actionable exemption gap	**3 501**	**938**	**871**	**2 623**	**- 97**
Actionable policy gap	**9 429**	**9 647**	**10 093**	**10 183**	**11 228**
C-efficiency	**57.73%**	**57.89%**	**58.48%**	**56.30%**	**58.10%**

Figure 64: AT: VAT policy gap, rate gap, and exemption gap



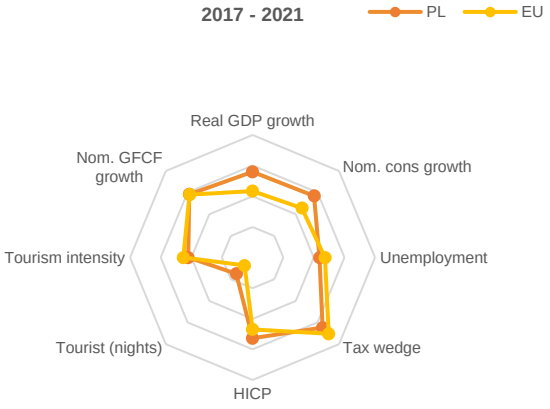
Source: own calculation, download underlying data.

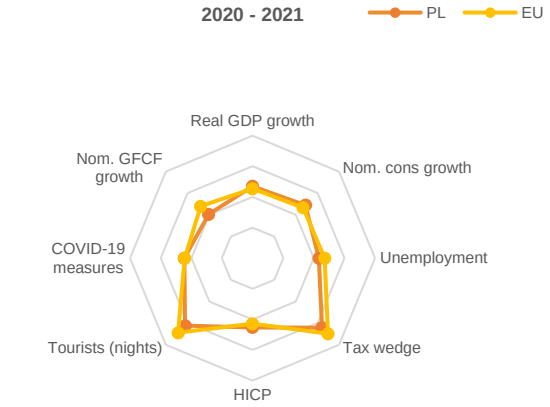
Poland

Economic and policy context

After a 2 percent decline in the scale of economic activity in 2020, Poland saw strong economic growth in 2021 with a real GDP growth rate of 6.9 percent. The unemployment rate, despite a slight increase, remained at a relatively low level of 3.4 percent. The growth of the VTTL was driven primarily by the growth of household and NPISH consumption expenditure (+8.9 percent in nominal terms), while GFCF stagnated. Inflation, measured as change in the HICP, was relatively high (5.2 percent).

Between 2017 and 2022, the economy of Poland expanded by 15.9 percent, providing favourable conditions to the increase in VAT compliance. Real growth was accompanied by a relatively high inflation rate (12.7 percent change in the HICP). Strong nominal household and NPISH consumption growth led to the large expansion of the VTTL. By 2021, the arrivals of tourists were still subdued. Yet, with the tourism intensity of 2 nights per inhabitant, the restrictions related to the COVID-19 pandemic had a relatively mild impact on the economy.





Highlights

- In July 2020, Poland implemented changes to its VAT systems, which led to the increase in economy-wide effective VAT rate in 2020 and 2021. Notable adjustments in the rate matrixes include the reduction of VAT rates for tropical fruits, bread, spices, e-press, and e-books. At the same time, the rate applicable to certain unprocessed spices and seafood was raised.
- In 2021, the VAT compliance gap decreased sharply by 7.8 pp, down to 3.3 percent of the VTTL. The improvement in the VAT compliance in the analysed five-year period was among the highest in the EU-27. Significant temporary changes (for example, 0 rate on food products) to the VAT rates introduced in 2022 in response to rising inflation resulted in highly questionable fast estimate figures. Because of that, the numbers were not presented in this report.
- The policy gap in Poland was among the highest in the EU due to wide application of exemptions and reduced rates. In 2021. it increased sizably – from 52 to 56 percent and this trend is expected to continue in 2022.

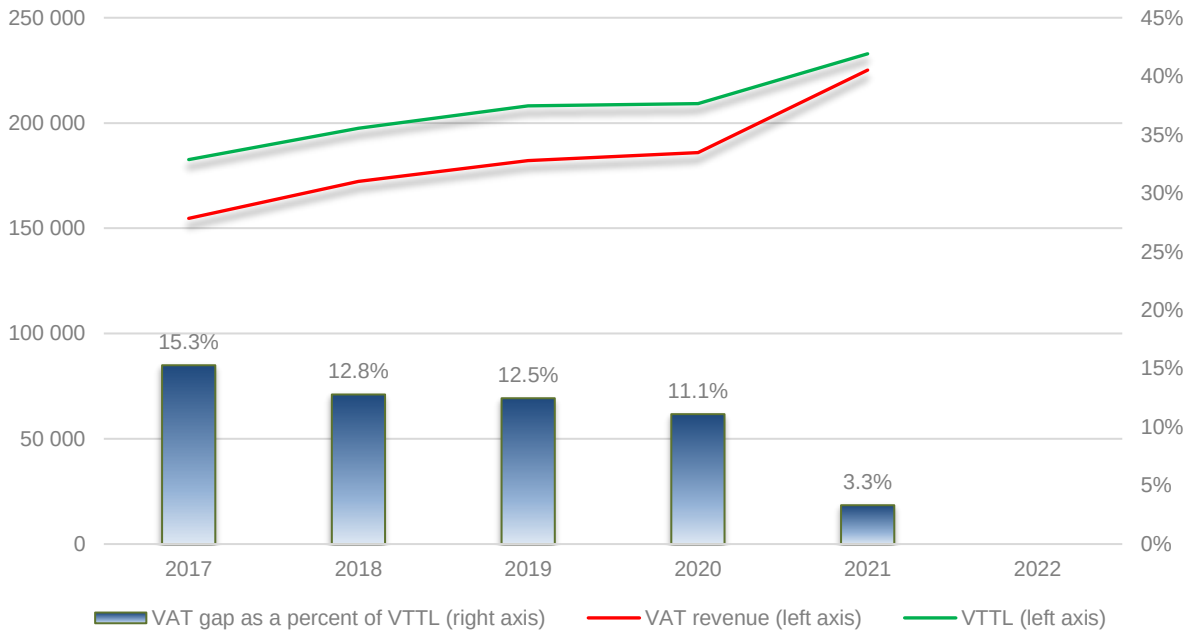
	2017-2021		2020-2021	
Variable	**PL**	**EU**	**PL**	**EU**
GDP (real, % change)	15.9	3.4	6.9	5.4
HH/NPISH cons. (nom)	16.9	5.7	8.9	6.7
Unemployment rate	3.8	7.4	3.4	7.1
Tax wedge	24.7	30.4	24.2	29.7
HICP	12.7	7.0	5.2	2.9
Tourist nights (% change)	-25.1	-32.6	22.3	28.8
Tourist nights (average)	2.0	5.2	-	-
COVID-19 measures (change)	-	-	4.5	4.3
GFCF (nom, % change)	18.4	18.1	0.6	8.0

Source: Euorstat

Table 47: PL: VAT compliance gaps, VAT receipts, composition of VTTL (PLN million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**182 614**	**197 524**	**208 091**	**209 198**	**232 872**	*X*
o/w liability on household final consumption	128 609	137 550	145 980	145 070	162 355	
o/w liability on gov. and NPISH final consumption	7 750	8 343	9 000	9 718	11 224	
o/w liability on intermediate consumption	27 177	28 512	29 591	29 997	33 526	
o/w liability on GFCF	16 562	20 559	20 912	21 648	22 643	
o/w net adjustments	2 516	2 560	2 609	2 766	3 124	
VAT revenue	**154 695**	**172 264**	**182 147**	**185 964**	**225 140**	*X*
VAT compliance gap	**27 919**	**25 260**	**25 944**	**23 234**	**7 732**	
VAT compliance gap (percent of VTTL)	**15.3%**	**12.8%**	**12.5%**	**11.1%**	**3.3%**	*X*
VAT compliance gap change since 2017					**-12.0 pp**	

Figure 65: PL: VAT compliance gap, VAT revenue, and VTTL

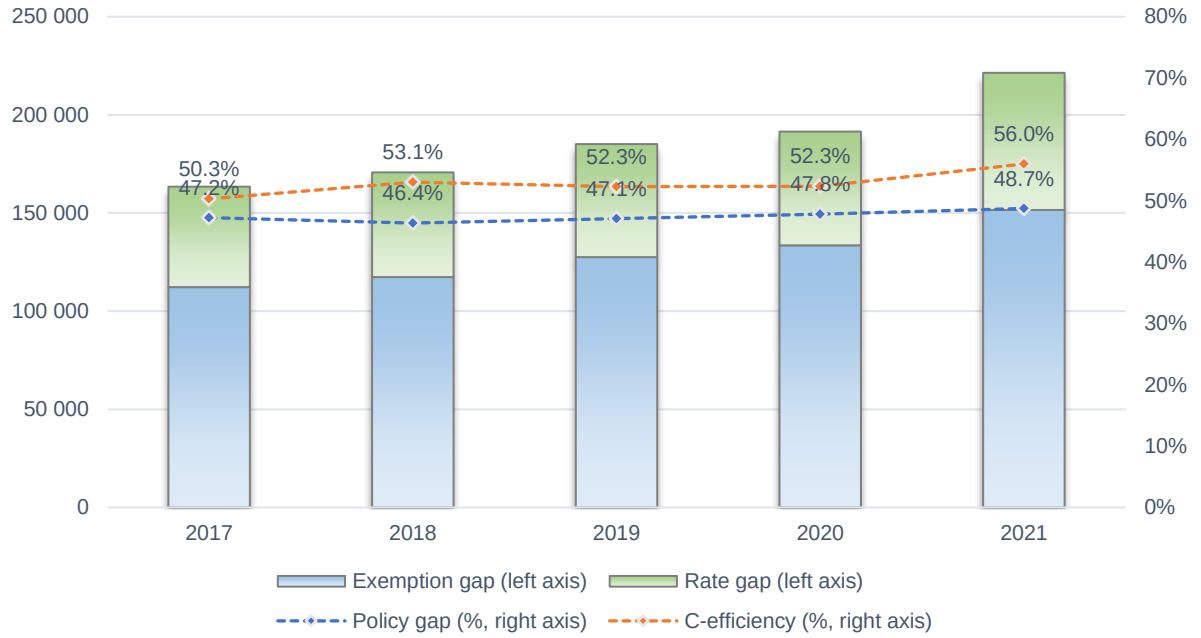


Source: own calculation, download underlying data.

Table 48: PL: VAT policy gap and its components (PLN million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**163 411**	**170 701**	**185 108**	**191 476**	**221 411**
Rate gap	51 170	53 345	57 572	57 951	69 867
Exemption gap	112 242	117 356	127 535	133 524	151 544
o/w imputed rents	*12 685*	*12 746*	*13 277*	*13 861*	*15 576*
o/w public services	*51 744*	*51 746*	*57 802*	*62 861*	*74 291*
o/w financial services	*11 986*	*11 425*	*11 820*	*11 556*	*12 911*
Actionable exemption gap	**35 826**	**41 439**	**44 636**	**45 247**	**48 767**
Actionable policy gap	**86 995**	**94 784**	**102 208**	**103 198**	**118 634**
C-efficiency	**50.30%**	**53.05%**	**52.30%**	**52.34%**	**56.00%**

Figure 66: PL: VAT policy gap, rate gap, and exemption gap



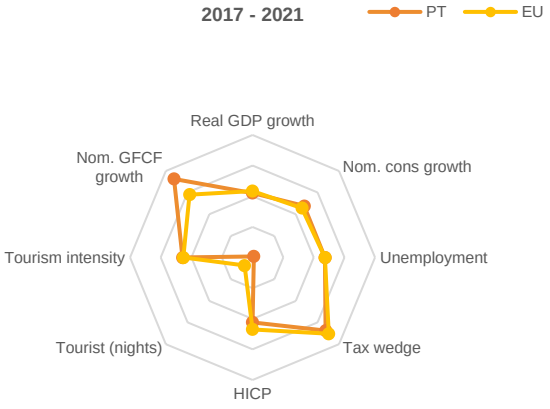
Source: own calculation, download underlying data.

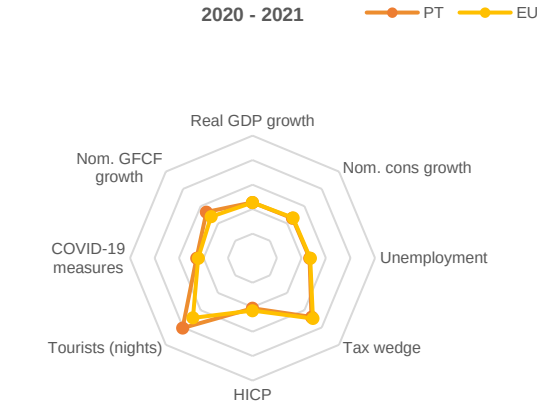
Portugal

Economic and policy context

Despite solid growth in 2021, real GDP in Portugal was more than 3 percent below the value recorded for 2019. In line with its economic recovery, the unemployment rate moderately decreased to 6.6 percent. COVID-19 restrictions intensified somewhat in 2021. Yet, the number of nights spent by tourists in hotel establishments went up by 40.7 percent. The growth of nominal consumption expenditures of households and NPISH of 6.1 percent as well as GFCF growth of 13.2 percent led to the sizable growth of the VTTL.

During 2017-2021, GDP growth in Portugal was rather sluggish (+2.2 percent over four years). GDP increased only modestly despite the substantial hike in the GFCF (32.5 percent in nominal terms). Price inflation was below the EU average as the change in prices over the period was only 2.3 percent. The only partial recovery in tourist arrivals has likely hampered the growth rates of the VTTL in Portugal between 2017 and 2021.





Highlights

- In 2021, the VAT compliance gap in Portugal fell by approximately 3.4 pp, down to 3.6 percent of the VTTL. This decline followed a four-year period of relative stability of the compliance gap.
- Due to the large shift in VAT revenue and the unavailability of up-to-date parameters, fast estimates for 2022 have not been presented in this study.
- The decrease of both the compliance and policy gaps led to an increase in the C-efficiency above 50 percent in 2021.

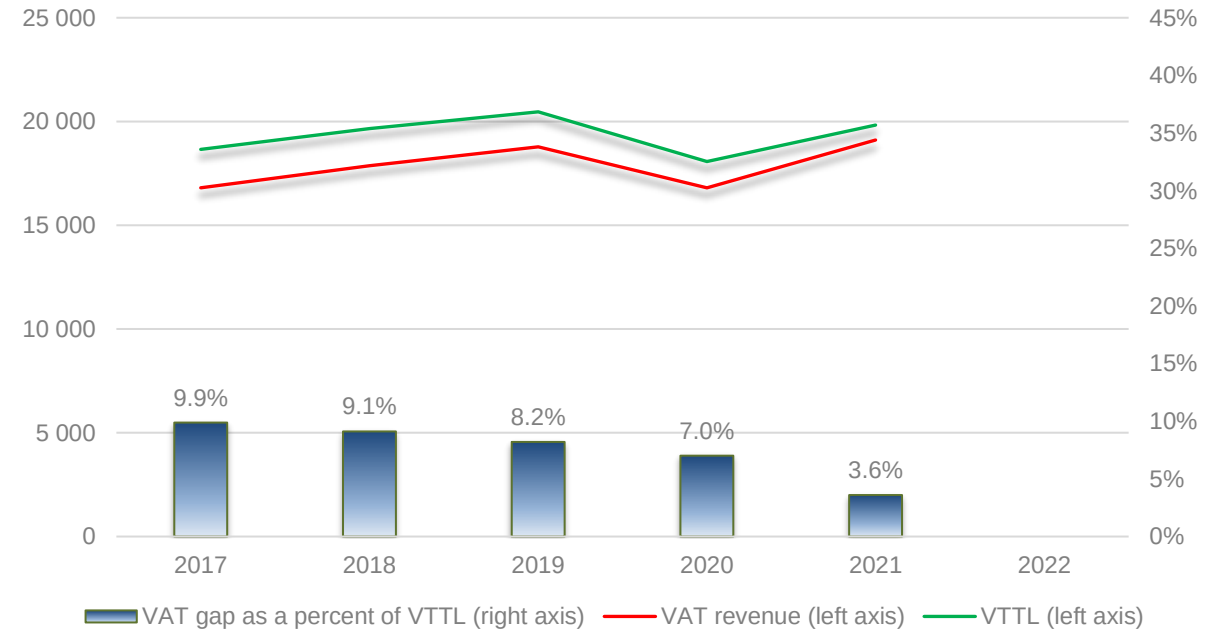
	2017-2021		2020-2021	
Variable	**PT**	**EU**	**PT**	**EU**
GDP (real, % change)	2.2	3.4	5.5	5.4
HH/NPISH cons. (nom)	7.7	5.7	6.1	6.7
Unemployment rate	7.3	7.4	6.6	7.1
Tax wedge	27.5	30.4	28.1	29.7
HICP	2.3	7.0	0.9	2.9
Tourist nights (% change)	-41.1	-32.6	40.7	28.8
Tourist nights (average)	5.8	5.2	-	-
COVID-19 measures (change)	-	-	5.6	4.3
GFCF (nom, % change)	32.5	18.1	13.2	8.0

Source: Euorstat

Table 49: PT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**18 653**	**19 660**	**20 465**	**18 071**	**19 821**	*X*
o/w liability on household final consumption	13 791	14 455	15 052	12 839	13 964	
o/w liability on gov. and NPISH final consumption	535	550	598	601	620	
o/w liability on intermediate consumption	2 925	3 053	3 218	3 080	3 456	
o/w liability on GFCF	1 031	1 187	1 230	1 283	1 474	
o/w net adjustments	372	415	366	269	308	
VAT revenue	**16 810**	**17 868**	**18 786**	**16 804**	**19 108**	*X*
VAT compliance gap	**1 844**	**1 792**	**1 679**	**1 267**	**713**	
VAT compliance gap (percent of VTTL)	**9.9%**	**9.1%**	**8.2%**	**7.0%**	**3.6%**	*X*
VAT compliance gap change since 2017					**-6.3 pp**	

Figure 67: PT: VAT compliance gap, VAT revenue, and VTTL

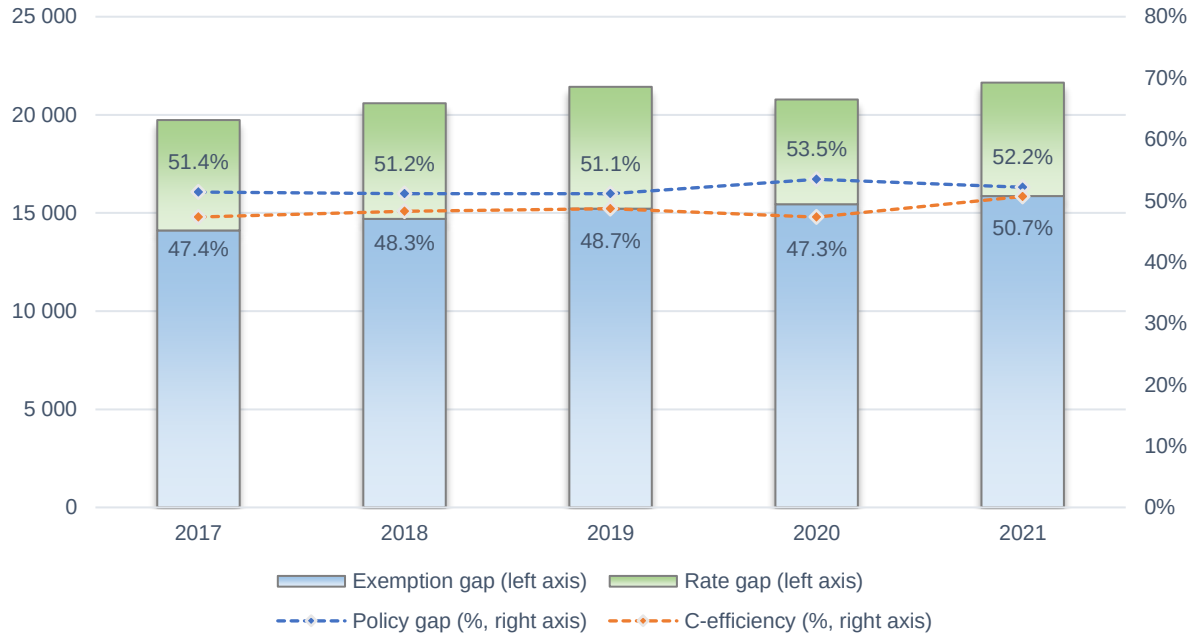


Source: own calculation, download underlying data.

Table 50: PT: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**19 736**	**20 591**	**21 428**	**20 783**	**21 642**
Rate gap	5 624	5 891	6 207	5 336	5 780
Exemption gap	14 111	14 701	15 220	15 446	15 862
o/w imputed rents	*3 164*	*3 282*	*3 421*	*3 550*	*3 705*
o/w public services	*7 405*	*7 669*	*8 030*	*8 063*	*8 297*
o/w financial services	*1 248*	*1 306*	*1 350*	*1 355*	*1 524*
Actionable exemption gap	**2 295**	**2 444**	**2 419**	**2 479**	**2 335**
Actionable policy gap	**7 919**	**8 334**	**8 627**	**7 815**	**8 116**
C-efficiency	**47.36%**	**48.28%**	**48.68%**	**47.33%**	**50.70%**

Figure 68: PT: VAT policy gap, rate gap, and exemption gap



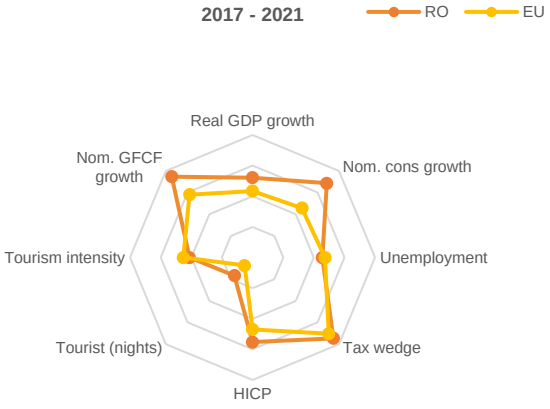
Source: own calculation, download underlying data.

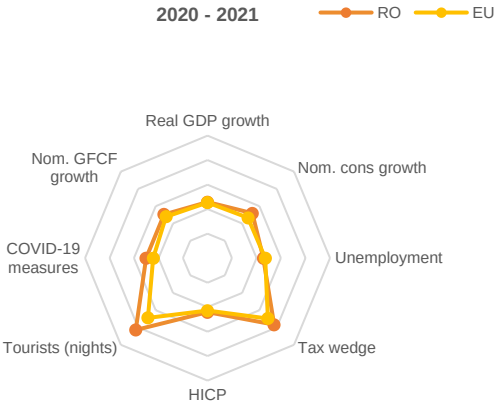
Romania

Economic and policy context

In 2021, Romania saw robust economic growth of 5.8 percent and a parallel decrease of the unemployment rate down to 5.6 percent. The intensity of COVID-19 containment measures increased in 2021, which did not interfere with the strong rebound in the demand for tourism services. The number of nights spent by tourists increased by 42.9 percent in 2021. Both the growth of nominal consumption expenditures of private households and NPISH and GFCF were high (11.8 percent and 10.4 percent, respectively). Inflation, measured as change in the HICP, was comparably high (4.1 percent).

Between 2017 and 2021, the economy of Romania expanded by 12.2 percent in real terms. This robust growth was accompanied by a very high inflation rate of 15.2 percent. Both the growth of nominal household and NPISH consumption (+28.6 percent) and GFCF (+34.6 percent) were very strong, reflecting the economic convergence in Romania with other EU Member States. The post-COVID-19 recovery of tourist arrivals was still incomplete, with a 23.2 percent reduction compared to 2017. Yet, the tourism sector had a relatively small impact on the economy.





Highlights

- The VAT compliance gap in Romania remained stable and high during the entire period (2017-2021).
- The compliance gap in 2021 fell, but only just – by 0.5 pp, down to 36.7 percent of the VTTL, the highest share recorded in the EU-27. Fast estimates suggest that in 2022 the improvement was more pronounced.
- In 2021, the policy gap decreased by 1.6 pp., down to 35.7 percent of notional ideal VAT revenue. This, in contrast to the compliance gap, is one of the lowest levels in the EU, due to relatively low share of consumption of exempted and non-taxable goods and services in Romania.

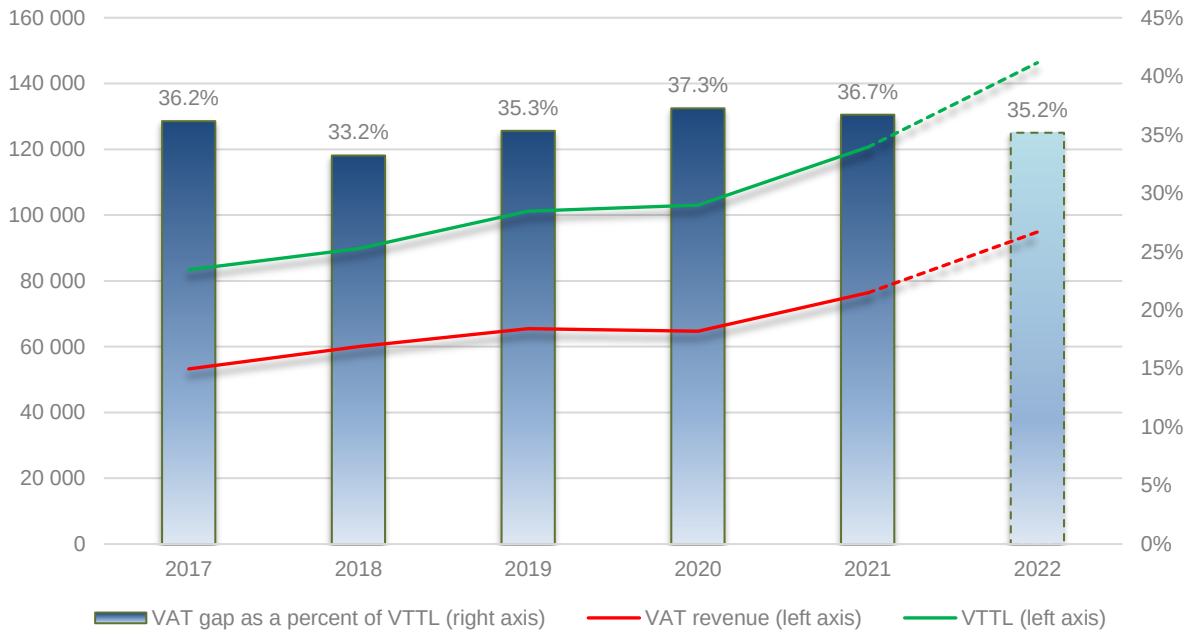
	2017-2021		2020-2021	
Variable	**RO**	**EU**	**RO**	**EU**
GDP (real, % change)	12.2	3.4	5.8	5.4
HH/NPISH cons. (nom)	28.6	5.7	11.8	6.7
Unemployment rate	5.6	7.4	5.6	7.1
Tax wedge	34.6	30.4	36.9	29.7
HICP	15.2	7.0	4.1	2.9
Tourist nights (% change)	-23.2	-32.6	42.9	28.8
Tourist nights (average)	1.2	5.2	-	-
COVID-19 measures (change)	-	-	10.2	4.3
GFCF (nom, % change)	34.6	18.1	10.4	8.0

Source: Euorstat

Table 51: RO: VAT compliance gaps, VAT receipts, composition of VTTL (RON million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**83 378**	**89 833**	**101 226**	**103 076**	**120 612**	*146 324*
o/w liability on household final consumption	52 517	57 697	62 291	60 221	69 932	
o/w liability on gov. and NPISH final consumption	3 280	3 581	4 306	4 385	4 544	
o/w liability on intermediate consumption	8 393	9 539	10 589	12 018	12 870	
o/w liability on GFCF	18 048	18 702	22 737	25 042	31 552	
o/w net adjustments	1 140	315	1 304	1 410	1 713	
VAT revenue	**53 229**	**59 990**	**65 461**	**64 677**	**76 336**	*94 867*
VAT compliance gap	**30 149**	**29 844**	**35 765**	**38 399**	**44 276**	
VAT compliance gap (percent of VTTL)	**36.2%**	**33.2%**	**35.3%**	**37.3%**	**36.7%**	*35.2%*
VAT compliance gap change since 2017					**+0.5 pp**	

Figure 69: RO: VAT compliance gap, VAT revenue, and VTTL[44]



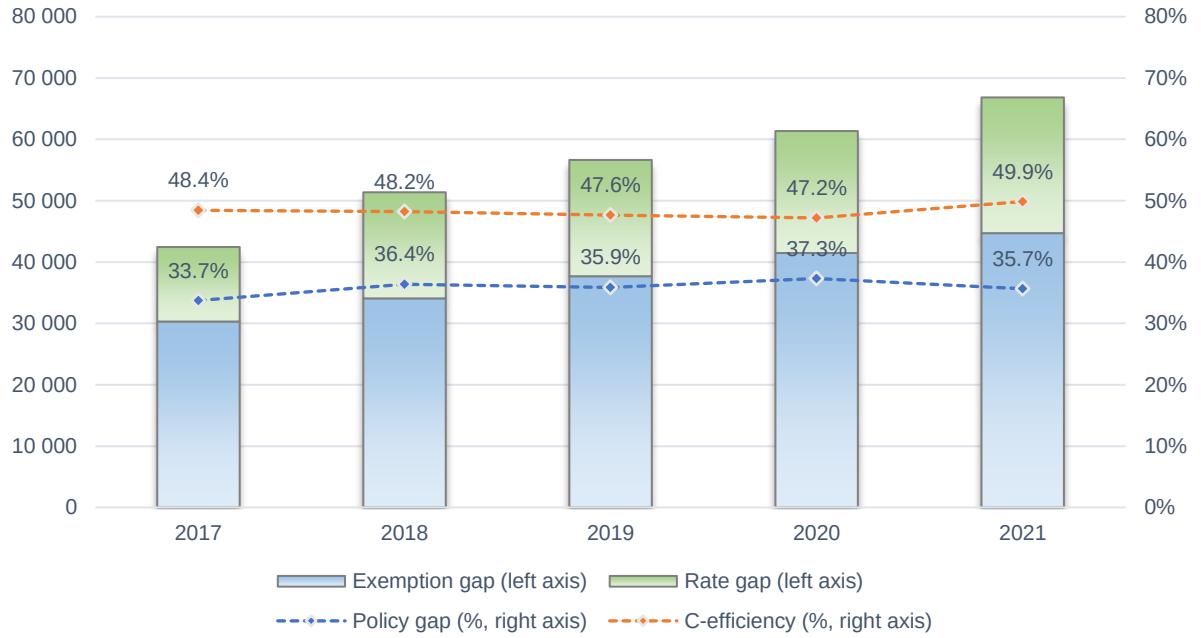
Source: own calculation, download underlying data.

[44] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 52: RO: VAT policy gap and its components (RON million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**42 453**	**51 377**	**56 650**	**61 364**	**66 841**
Rate gap	12 142	17 297	18 958	19 888	22 127
Exemption gap	30 310	34 080	37 692	41 476	44 713
o/w imputed rents	*10 527*	*10 646*	*12 177*	*11 780*	*13 326*
o/w public services	*15 639*	*18 243*	*20 335*	*19 111*	*19 037*
o/w financial services	*- 352*	*- 28*	*- 519*	*- 362*	*- 381*
Actionable exemption gap	**4 497**	**5 220**	**5 699**	**10 947**	**12 732**
Actionable policy gap	**16 639**	**22 517**	**24 657**	**30 834**	**34 859**
C-efficiency	**48.44%**	**48.25%**	**47.63%**	**47.20%**	**49.87%**

Figure 70: RO: VAT policy gap, rate gap, and exemption gap



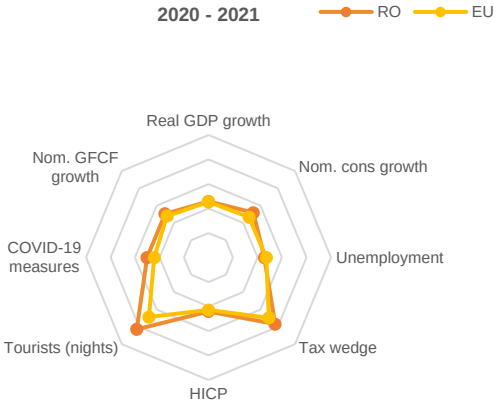
Source: own calculation, download underlying data.

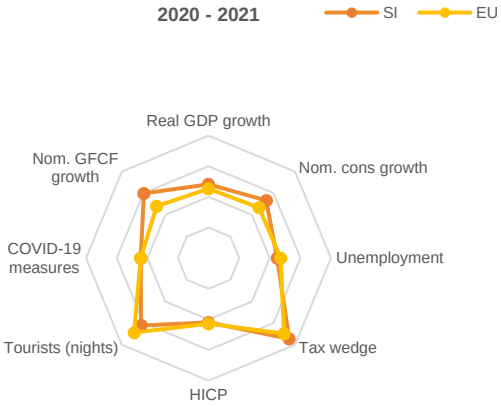
Slovenia

Economic and policy context

In 2021, Slovenia saw strong economic growth with a real GDP growth rate of 8.2 percent. Thanks to this, Slovenia has fully recovered from the recession recorded in 2020. The COVID-19 containment measures increased somewhat in 2021, but the number of nights spent by tourists in hotel and other establishments rebounded by 22.2 percent. The growth rates of nominal consumption expenditures of households and NPISH as well as GFCF were relatively strong (+13.3 percent and 19.7 percent, respectively). Inflation, measured as the rate of change of the HICP, was comparably low (2.1 percent).

Real GDP growth of 11.9 percent between 2017 and 2019 was accompanied by a moderate inflation rate (5.5 percent increase in the HICP over four years). Both the growth in nominal household and NPISH consumption (+18.1 percent) and GFCF (+34.8 percent) were relatively strong. The post-COVID-19 recovery in the number of nights spent by tourists was partial, with the remaining gap of 9.9 percent with respect to 2017. The tax wedge in Slovenia was relatively high (34.1 percent).





Highlights

- The VAT compliance gap in Slovenia fell in 2021 by 3.4 pp, reaching 2 percent of the VTTL. This was the fifth lowest estimate in the EU.
- The fast estimates for 2022 are not published in this report as a result of uncertainty over underlying figures on revenue and components of the VTTL.
- Between 2017 and 2021, both the compliance and policy gaps were relatively stable. As a result, C-efficiency followed a sideways trend fluctuating between 53.7 and 57.7 percent.

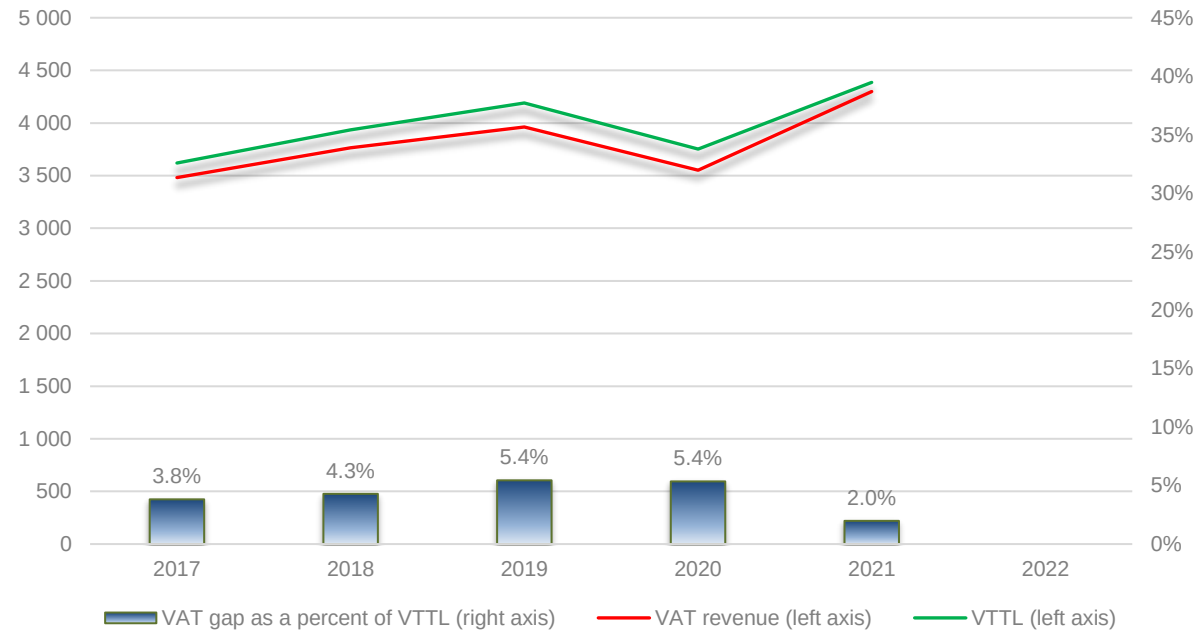
	2017-2021		2020-2021	
Variable	**SI**	**EU**	**SI**	**EU**
GDP (real, % change)	11.9	3.4	8.2	5.4
HH/NPISH cons. (nom)	18.1	5.7	13.3	6.7
Unemployment rate	5.2	7.4	4.8	7.1
Tax wedge	34.1	30.4	34.5	29.7
HICP	5.5	7.0	2.1	2.9
Tourist nights (% change)	-9.9	-32.6	22.2	28.8
Tourist nights (average)	5.8	5.2	-	-
COVID-19 measures (change)	-	-	4.3	4.3
GFCF (nom, % change)	34.8	18.1	19.7	8.0

Source: Euorstat

Table 53: SI: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2021)

	2017	2018	2019	2020	2021	*2022*
VTTL	**3 620**	**3 934**	**4 191**	**3 754**	**4 386**	*X*
o/w liability on household final consumption	2 679	2 840	3 025	2 622	3 038	
o/w liability on gov. and NPISH final consumption	83	97	99	107	119	
o/w liability on intermediate consumption	461	518	559	540	628	
o/w liability on GFCF	329	402	428	430	531	
o/w net adjustments	68	77	79	54	69	
VAT revenue	**3 481**	**3 765**	**3 962**	**3 553**	**4 299**	*X*
VAT compliance gap	**138**	**169**	**228**	**201**	**87**	
VAT compliance gap (percent of VTTL)	**3.8%**	**4.3%**	**5.4%**	**5.4%**	**2.0%**	*X*
VAT compliance gap change since 2017					**-1.8 pp**	

Figure 71: SI: VAT compliance gap, VAT revenue, and VTTL

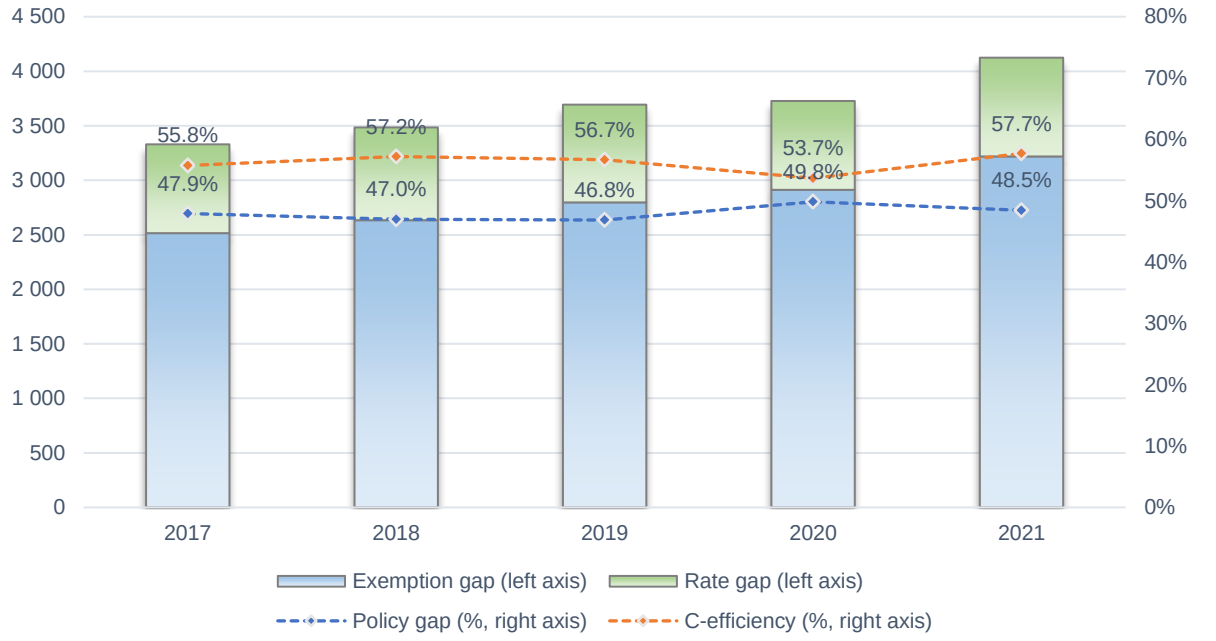


Source: own calculation, download underlying data.

Table 54: SI: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**3 330**	**3 485**	**3 694**	**3 727**	**4 124**
Rate gap	814	851	896	815	906
Exemption gap	2 515	2 634	2 797	2 912	3 219
o/w imputed rents	*541*	*576*	*583*	*588*	*624*
o/w public services	*1 253*	*1 253*	*1 337*	*1 485*	*1 599*
o/w financial services	*188*	*203*	*223*	*192*	*238*
Actionable exemption gap	**533**	**601**	**654**	**647**	**759**
Actionable policy gap	**1 348**	**1 452**	**1 550**	**1 462**	**1 664**
C-efficiency	**55.77%**	**57.19%**	**56.71%**	**53.67%**	**57.71%**

Figure 72: SI: VAT policy gap, rate gap, and exemption gap



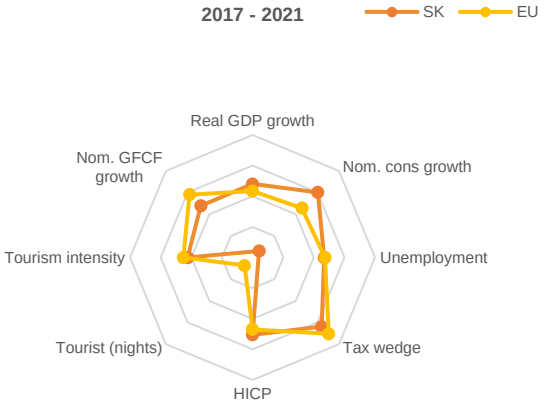
Source: own calculation, download underlying data.

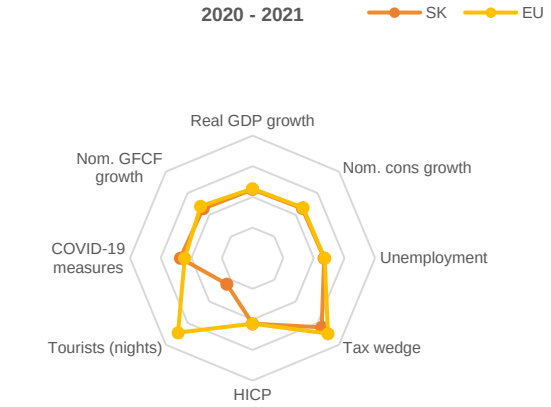
Slovakia

Economic and policy context

In 2021, the Slovakian economy increased by 4.9 percent in real terms. The pace of GDP growth in 2021 was below the EU average, whereas the contraction recorded in 2020 was relatively mild (-3.3 percent). Despite the economic recovery, the unemployment rate increased slightly to 6.8 percent. The intensity of COVID-19 measures increased somewhat in 2021, which further decreased demand for accommodation services (16.1 percent drop in nights spent in hotels and other tourist establishments). The growth of household and NPISH consumption and GFCF were modest (5.9 percent and 5.7 percent growth in nominal terms, respectively). Inflation, measured as change in the HICP, was 2.8 percent.

With average yearly growth of 2 percent and average yearly price inflation of ca. 2.5 percent, Slovakia's economic growth between 2017 and 2021 was above the EU average but below its regional peers. Household and NPISH consumption, the main component of the VTTL, increased by 20.2 percent over the four-year period. Economic growth was clearly hampered by tourism. The number of nights spent in hotels and other tourist establishments was 46 percent lower than in 2017.





Highlights

- Between 2017 and 2021, the VAT compliance gap in Slovakia decreased steadily by about 1.9 pp on average each year. In 2021, the decrease in the VAT compliance gap was even higher – it dropped by 3.4 pp, down to 10.6 percent of VTTL. Based on fast estimates, it is expected that in 2022 the VAT compliance gap increased slightly.
- C-efficiency in Slovakia was exceptionally stable during the analysed period. In 2021, it accounted for ca. 53 percent, which was ca. 5 pp below the EU average.

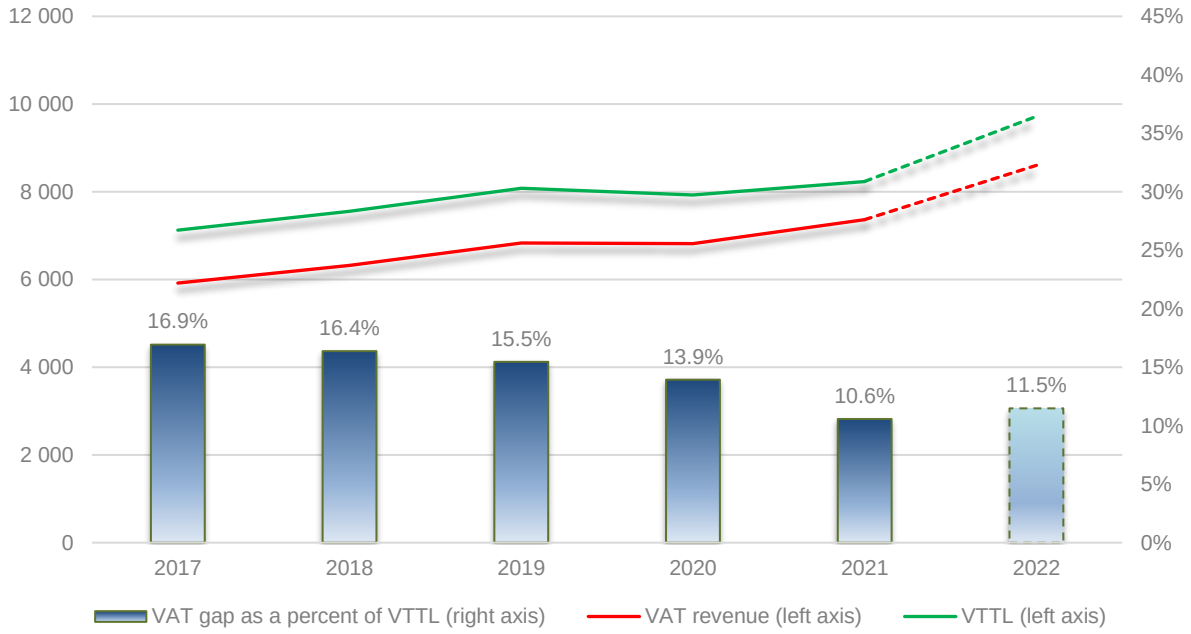
	2017-2021		2020-2021	
Variable	**SK**	**EU**	**SK**	**EU**
GDP (real, % change)	8.1	3.4	4.9	5.4
HH/NPISH cons. (nom)	20.2	5.7	5.9	6.7
Unemployment rate	6.8	7.4	6.8	7.1
Tax wedge	23.9	30.4	23.9	29.7
HICP	10.5	7.0	2.8	2.9
Tourist nights (% change)	-46.0	-32.6	-16.1	28.8
Tourist nights (average)	2.4	5.2	-	-
COVID-19 measures (change)	-	-	7.2	4.3
GFCF (nom, % change)	7.8	18.1	5.7	8.0

Source: Euorstat

Table 55: SK: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**7 125**	**7 557**	**8 079**	**7 925**	**8 236**	*9 718*
o/w liability on household final consumption	5 437	5 732	6 033	5 971	6 123	
o/w liability on gov. and NPISH final consumption	98	132	104	106	118	
o/w liability on intermediate consumption	908	949	1 149	1 130	1 271	
o/w liability on GFCF	680	761	802	730	732	
o/w net adjustments	2	- 17	- 8	- 14	- 7	
VAT revenue	**5 919**	**6 319**	**6 830**	**6 820**	**7 366**	*8 603*
VAT compliance gap	**1 206**	**1 237**	**1 249**	**1 104**	**871**	
VAT compliance gap (percent of VTTL)	**16.9%**	**16.4%**	**15.5%**	**13.9%**	**10.6%**	*11.5%*
VAT compliance gap change since 2017					**-6.4 pp**[45]	

Figure 73: SK: VAT compliance gap, VAT revenue, and VTTL[46]



Source: own calculation, download underlying data.

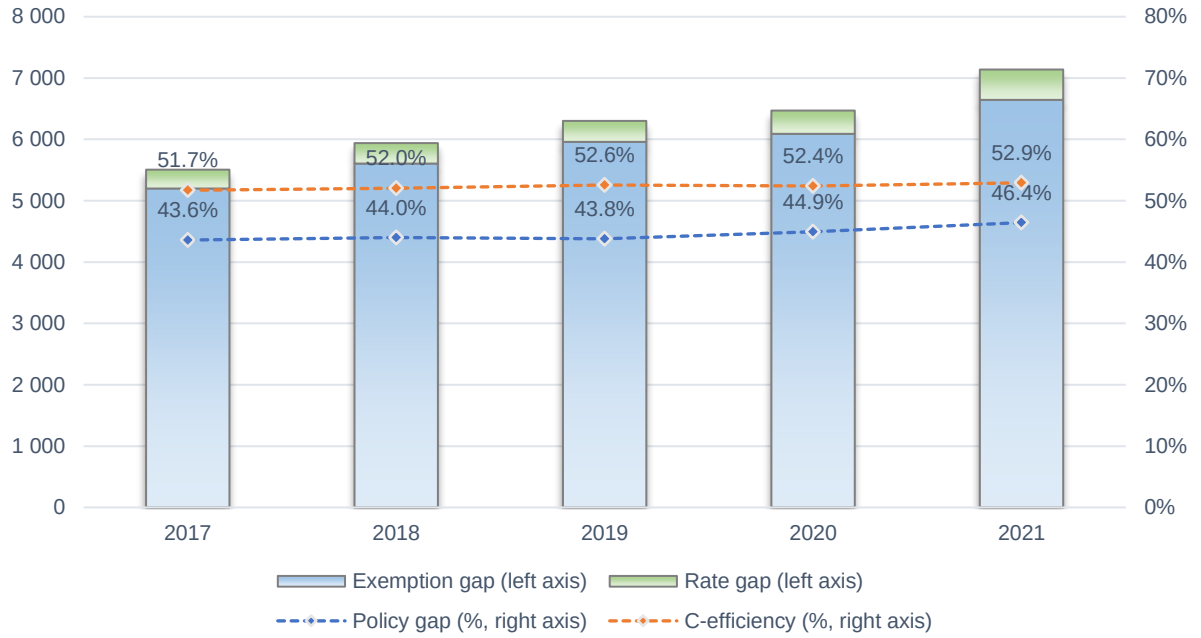
[45] *Numbers do not add up due to rounding*

[46] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 56: SK: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**5 507**	**5 940**	**6 301**	**6 470**	**7 139**
Rate gap	307	333	342	380	495
Exemption gap	5 200	5 606	5 960	6 091	6 644
o/w imputed rents	*1 215*	*1 317*	*1 351*	*1 453*	*1 591*
o/w public services	*2 358*	*2 386*	*2 681*	*2 731*	*3 081*
o/w financial services	*322*	*362*	*367*	*344*	*368*
Actionable exemption gap	**1 305**	**1 541**	**1 560**	**1 562**	**1 605**
Actionable policy gap	**1 612**	**1 875**	**1 902**	**1 942**	**2 100**
C-efficiency	**51.71%**	**52.04%**	**52.57%**	**52.42%**	**52.92%**

Figure 74: SK: VAT policy gap, rate gap, and exemption gap



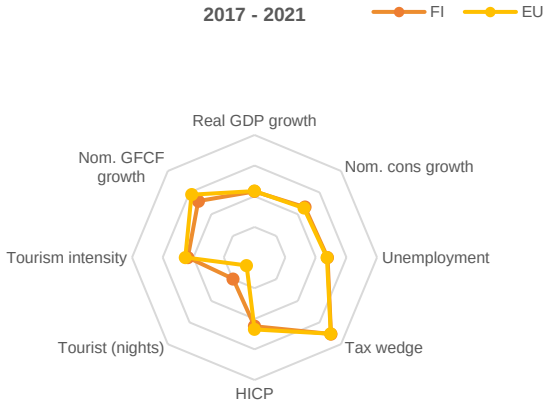
Source: own calculation, download underlying data.

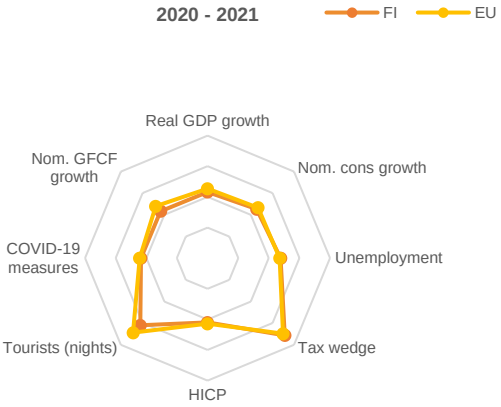
Finland

Economic and policy context

Real GDP in Finland was relatively stable during the COVID-19 pandemic. In 2020, Finnish GDP dropped by 2.4 percent to increase by 3.2 percent in the following year. The unemployment rate remained unchanged during the period and accounted for 7.7 percent. A slight increase in the intensity of COVID-19 measures did not interfere with a solid recovery in the number of nights spent by tourists in hotels and similar establishments (+22.1 percent year-over-year). Consumption expenditures of households and NPISH increased by 5.3 percent in nominal terms, while the growth of GFCF amounted to only 3.4 percent. Inflation, measured as change in the HICP, was relatively low at 2.1 percent.

Moderate real GDP growth (of 0.8 percent on average per year) and a low inflation rate (of 1.2 percent on average per year) were also observed in the entire period covered by the VAT gap estimates. The main component of the VTTL, household and NPISH consumption, increased by 7.7 percent, whereas GFCF increased by 12 percent in nominal terms. The tourism industry in 2021 is still suffering from the impact of the COVID-19 pandemic. Compared to 2017, the number of nights spent in hotels and similar establishments was ca. 20 percent lower.





Highlights

- In 2021, the VAT compliance gap in Finland dropped by 1.6 pp, down to only 0.4 percent of the VTTL. Similar to previous years, the VAT compliance gap in Finland was among the lowest in the EU.
- It is expected that the compliance gap in 2022 will somewhat increase. Yet, there is some uncertainty around the fluctuations of the gap in this period due to the difficulty accounting for deferred tax payments and changes to the VTTL parameters.
- The size of the policy gap between 2017 and 2020 was exceptionally stable ranging from 49.7 to 50.6 percent of notional ideal revenue. This is the result of stable VAT system which undergone very few changes in recent years.

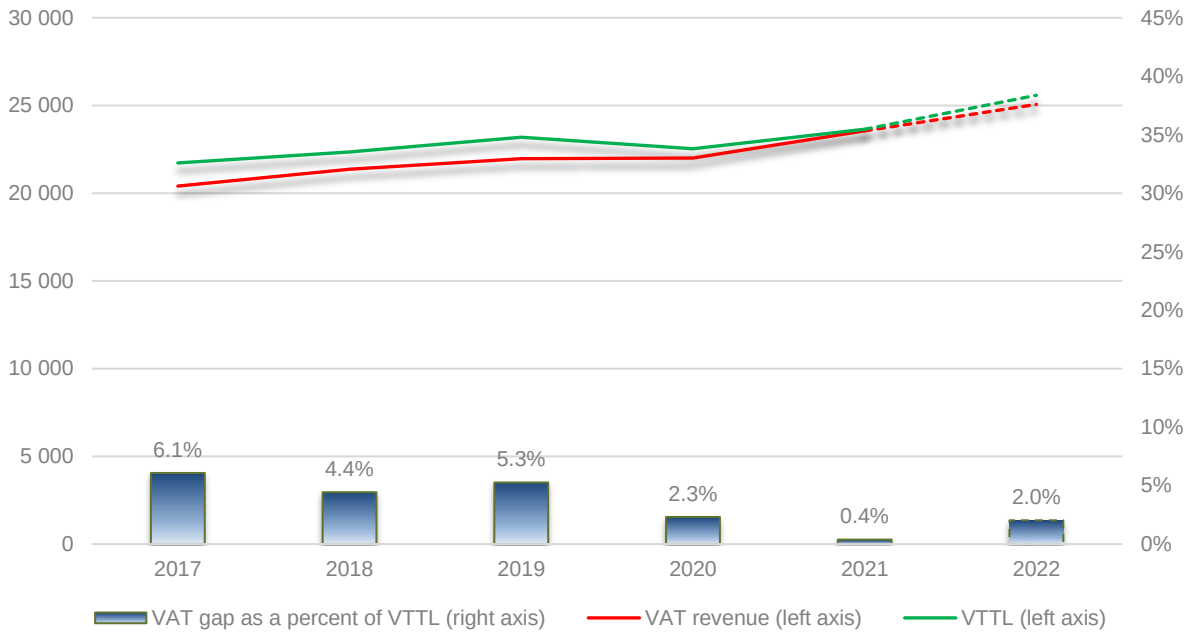
	2017-2021		2020-2021	
Variable	**FI**	**EU**	**FI**	**EU**
GDP (real, % change)	3.1	3.4	3.2	5.4
HH/NPISH cons. (nom)	6.6	5.7	5.3	6.7
Unemployment rate	7.7	7.4	7.7	7.1
Tax wedge	30.6	30.4	31.3	29.7
HICP	4.8	7.0	2.1	2.9
Tourist nights (% change)	-20.2	-32.6	22.1	28.8
Tourist nights (average)	3.6	5.2	-	-
COVID-19 measures (change)	-	-	3.5	4.3
GFCF (nom, % change)	12.0	18.1	3.4	8.0

Source: Euorstat

Table 57: FI: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**21 723**	**22 354**	**23 195**	**22 527**	**23 641**	*25 580*
o/w liability on household final consumption	11 830	12 121	12 205	11 684	12 397	
o/w liability on gov. and NPISH final consumption	489	520	565	566	599	
o/w liability on intermediate consumption	4 651	4 711	4 824	4 909	5 186	
o/w liability on GFCF	3 987	4 300	4 819	4 663	4 717	
o/w net adjustments	768	703	782	705	741	
VAT revenue	**20 404**	**21 364**	**21 974**	**22 005**	**23 551**	*25 061*
VAT compliance gap	**1 319**	**990**	**1 221**	**522**	**90**	
VAT compliance gap (percent of VTTL)	**6.1%**	**4.4%**	**5.3%**	**2.3%**	**0.4%**	*2.0%*
VAT compliance gap change since 2017					**-5.7 pp**	

Figure 75: FI: VAT compliance gap, VAT revenue, and VTTL[47]



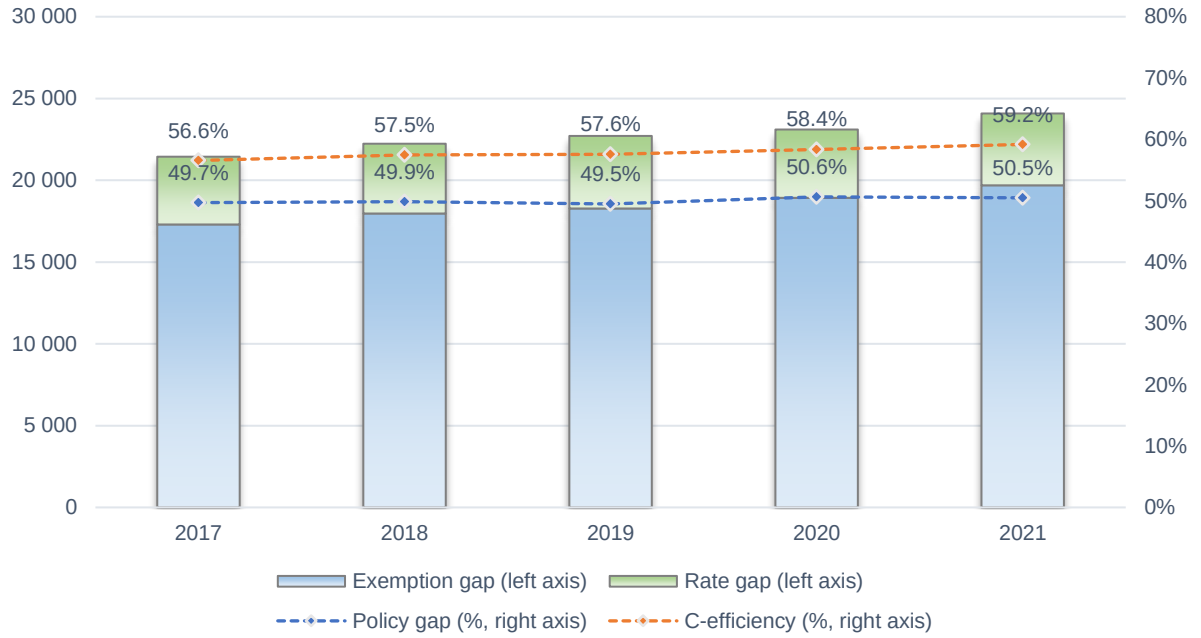
Source: own calculation, download underlying data.

[47] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 58: FI: VAT policy gap and its components (EUR million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**21 442**	**22 236**	**22 711**	**23 103**	**24 085**
Rate gap	4 142	4 266	4 435	4 176	4 392
Exemption gap	17 300	17 970	18 277	18 927	19 693
o/w imputed rents	*4 360*	*4 488*	*4 626*	*4 837*	*5 058*
o/w public services	*9 344*	*9 621*	*9 540*	*10 006*	*10 904*
o/w financial services	*1 225*	*1 338*	*1 344*	*1 443*	*1 506*
Actionable exemption gap	**2 371**	**2 523**	**2 767**	**2 641**	**2 224**
Actionable policy gap	**6 513**	**6 789**	**7 201**	**6 817**	**6 616**
C-efficiency	**56.56%**	**57.48%**	**57.60%**	**58.37%**	**59.18%**

Figure 76: FI: VAT policy gap, rate gap, and exemption gap



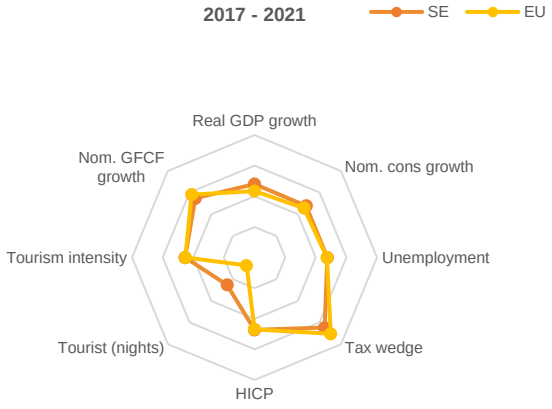
Source: own calculation, download underlying data.

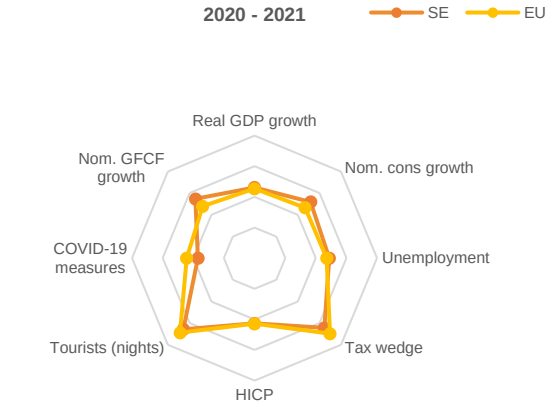
Sweden

Economic and policy context

Sweden saw robust economic growth in 2021. The economy expanded by 6.1 percent following a 2 percent contraction in 2020. Despite the economic recovery, the unemployment rate slightly increased (up to 8.8 percent). The intensity of COVID-19 restrictions decreased slightly in 2021, which is also reflected in a rebound in the number of nights spent by tourists in hotels and similar establishments (+25.7 percent). Despite a rather low inflation rate, nominal household and NPISH consumption expenditure as well as GFCF sharply increased (11.9 and 14.7 percent, respectively).

Between 2017 and 2021, the Swedish economy expanded by 8 percent in real terms, which was accompanied by a similar increase in consumer prices (+7.3 percent). The post-COVID-19 recovery of the tourism industry, proxied by the number of nights spent by tourists in hotels and hotel establishments, was still incomplete (-14.7 percent compared to 2017). This likely hampered economic growth, as the intensity of tourism was relatively high (5.3 nights per year per inhabitant).





Highlights

- The VAT compliance gap in Sweden remained exceptionally stable between 2017 and 2021. In 2021, it was ca. 3.8 percent. Based on fast estimates, it is expected that this pattern continued in 2022.
- As both the VAT compliance and policy gaps were stable, the C-efficiency followed a sideways trend fluctuating between 59.5 and 60.8 percent in the analysed five-year period.

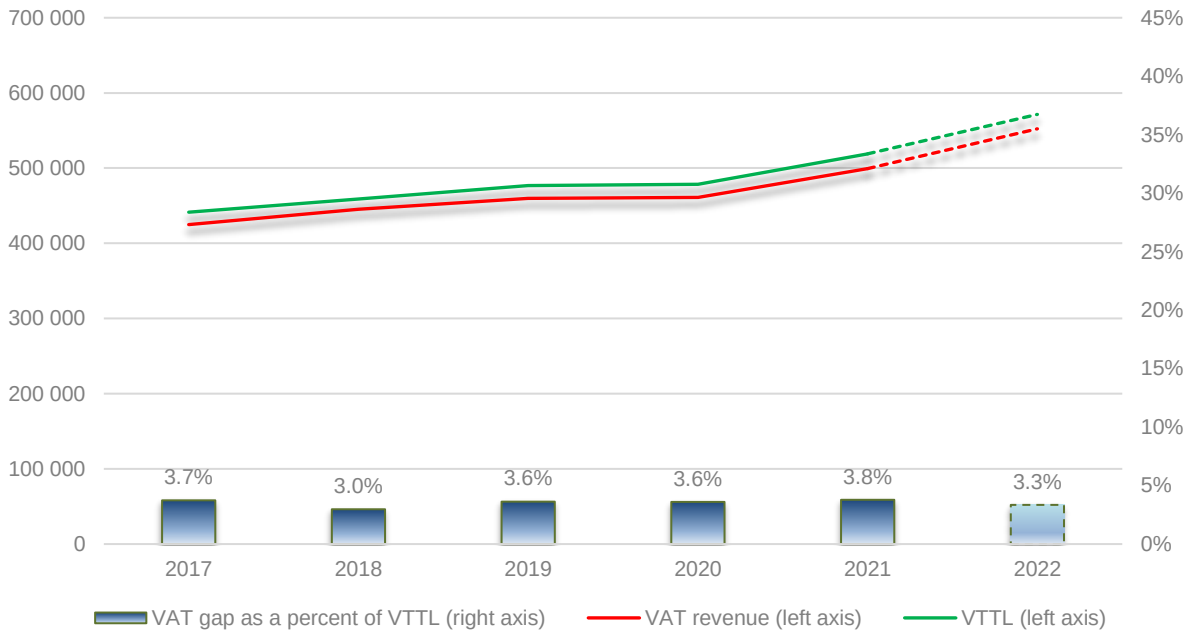
	2017-2021		2020-2021	
Variable	**SE**	**EU**	**SE**	**EU**
GDP (real, % change)	8.0	3.4	6.1	5.4
HH/NPISH cons. (nom)	7.8	5.7	11.9	6.7
Unemployment rate	7.5	7.4	8.8	7.1
Tax wedge	24.7	30.4	24.4	29.7
HICP	7.3	7.0	2.7	2.9
Tourist nights (% change)	-14.7	-32.6	25.7	28.8
Tourist nights (average)	5.3	5.2	-	-
COVID-19 measures (change)	-	-	-3.0	4.3
GFCF (nom, % change)	14.7	18.1	14.7	8.0

Source: Euorstat

Table 59: SE: VAT compliance gaps, VAT receipts, composition of VTTL (SEK million, 2017-2022)

	2017	2018	2019	2020	2021	*2022*
VTTL	**441 389**	**458 891**	**476 994**	**478 372**	**518 999**	*571 439*
o/w liability on household final consumption	224 754	234 683	241 592	237 537	257 670	
o/w liability on gov. and NPISH final consumption	17 542	18 744	20 158	19 982	21 493	
o/w liability on intermediate consumption	104 203	108 994	114 962	117 453	127 520	
o/w liability on GFCF	89 676	90 857	94 371	99 518	108 117	
o/w net adjustments	5 215	5 613	5 911	3 881	4 199	
VAT revenue	**424 886**	**445 241**	**459 699**	**461 132**	**499 361**	*552 302*
VAT compliance gap	**16 503**	**13 650**	**17 295**	**17 240**	**19 638**	
VAT compliance gap (percent of VTTL)	**3.7%**	**3.0%**	**3.6%**	**3.6%**	**3.8%**	*3.3%*
VAT compliance gap change since 2017					**+0.0 pp**	

Figure 77: SE: VAT compliance gap, VAT revenue, and VTTL[48]



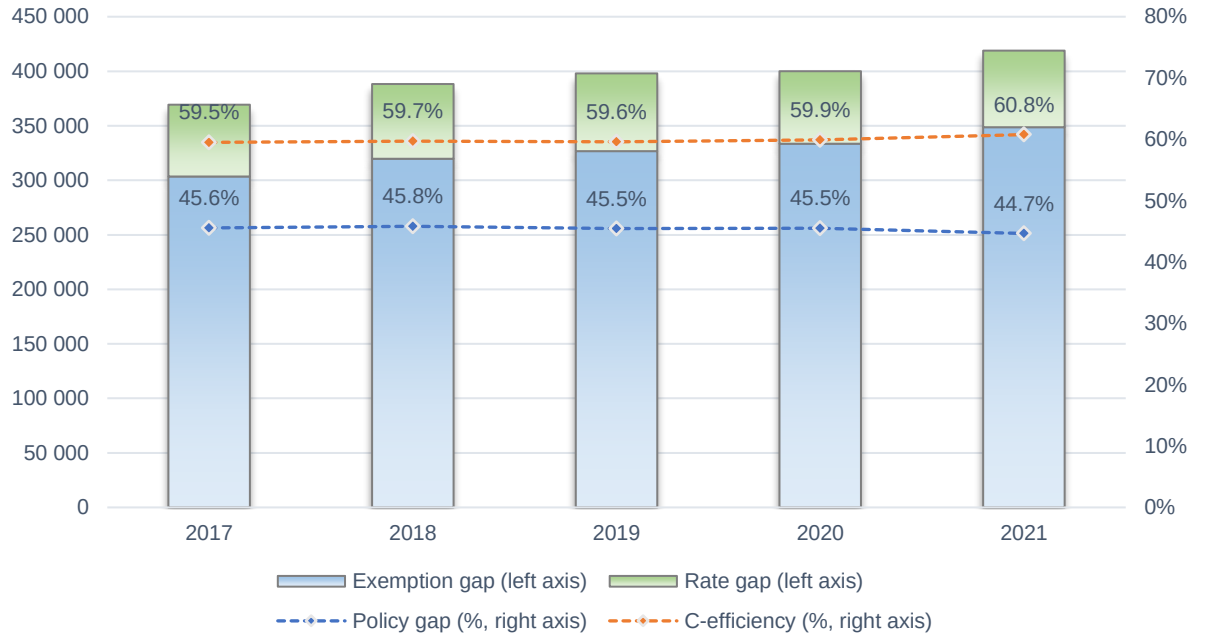
Source: own calculation, download underlying data.

[48] *The confidence around the estimates for 2022 is higher as they are based on a simplified methodology and more aggregate data.*

Table 60: SE: VAT policy gap and its components (SEK million, 2017-2021)

	2017	2018	2019	2020	2021
VAT policy gap	**369 315**	**388 270**	**398 013**	**400 002**	**418 908**
Rate gap	65 836	68 515	71 288	66 459	70 239
Exemption gap	303 480	319 755	326 726	333 543	348 669
o/w imputed rents	*37 401*	*39 483*	*41 249*	*41 322*	*43 387*
o/w public services	*214 233*	*221 200*	*226 272*	*231 949*	*244 114*
o/w financial services	*25 266*	*24 721*	*23 347*	*26 953*	*29 417*
Actionable exemption gap	**26 580**	**34 351**	**35 858**	**33 319**	**31 752**
Actionable policy gap	**92 416**	**102 866**	**107 146**	**99 778**	**101 991**
C-efficiency	**59.51%**	**59.70%**	**59.61%**	**59.93%**	**60.78%**

Figure 78: SE: VAT policy gap, rate gap, and exemption gap



Source: own calculation, download underlying data.

VII. Data availability and reliability

VII.a. Data availability, timeliness, and granularity

The major risk factor for the study and its continuation in the future is related to the availability of the data necessary to calculate the VTTL model parameters. As discussed in EC/CASE (2022), it was expected that in total less than 50 percent of the information that was gathered earlier from the Own Resource Submission (ORS) would be available for the calculation of the 2021 VTTL in this vintage of the study. Moreover, the availability of information was expected to vary substantially across Member States. In addition to the scarcity of granular and timely information necessary to calculate model parameters, some delays and inaccuracies in national accounts data caused by the COVID-19 pandemic were expected. This chapter updates these earlier considerations by analysing the actual availability of information at the moment when the final estimates were derived.

The crucial data gathered from Eurostat cover the information about the tax base contained in the use tables as well as more granular and up-to-data household final consumption figures. Moreover, two series of tax aggregates are used to assess the VAT gaps. More specifically, the following Eurostat categories were used:

1. **Final consumption expenditure of households by consumption purpose (COICOP 3 digit) [NAMA_10_CO3_P3]**[49]
2. **Main national accounts tax aggregates [GOV_10A_TAXAG]**[50]
   - **D211** (Value added type taxes (VAT)
   - **D995A** Taxes on products assessed but unlikely to be collected.
3. **Use table at purchasers' prices [NAIO_10_CP16]**[51]

below presents the number of Member States for which a given variable was not available. For the purposes of the study, the data should cover at least the 2017-2021 period. However, since the data for many of the Member States were not available for the entire period (especially from symmetric input-output tables), selected information from 2015 and 2016 was also considered.

indicates that the consumption expenditure at the 3-digit COICOP breakdown was not fully available and for certain categories the data was somewhat patchy. This increased the need for obtaining up-to-date, complete, and granular information on household final consumption structure directly from the Member States' administrations. While the VAT revenue series (D211) were complete, the availability of 'VAT assessed but unlikely to be collected' (D995A) was published only for approximately half of the Member States. Notably, in the case of seven countries, this amounted to zero, indicating that this element is not estimated or it is not included in the baseline VAT revenue.

[49] https://ec.europa.eu/eurostat/databrowser/view/nama_10_co3_p3/default/table?lang=en.
[50] https://ec.europa.eu/eurostat/databrowser/view/gov_10a_taxag/default/table?lang=en.
[51] https://ec.europa.eu/eurostat/databrowser/view/NAIO_10_CP16/default/table?lang=en&category=na10.naio_10.naio_10_cp.

Table 61: Data availability for 2015-2021

Variable	Number of MS for which data was not available/year						
	2015	2016	2017	2018	2019	2020	2021
Final consumption expenditure of households by consumption purpose (COICOP 3 digit) [NAMA_10_CO3_P3]							
CP021	1	1	1	1	1	1	1
CP022	4	4	4	4	4	4	4
CP023	5	5	5	5	5	5	5
CP083	1	1	1	1	1	1	1
CP101	1	1	1	1	1	1	1
CP102	1	1	1	1	1	1	1
CP103	2	2	2	2	2	2	2
CP104	1	1	1	1	1	1	1
CP122	9	9	9	9	9	9	9
CP123	1	1	1	1	1	1	1
CP124	1	1	1	1	1	1	1
CP125	1	1	1	1	1	1	1
CP126	1	1	1	1	1	1	1
CP127	9	9	9	9	9	9	9
Main national accounts tax aggregates [GOV_10A_TAXAG]							
D995A	15	15	15	15	15	15	15
Use table at purchasers' prices [NAIO_10_CP16]							
All products	5	2	2	3	3	20	26

Source: own elaboration based on Eurostat.
Note: for some Member States, use tables are not published annually.

The lack of SUT for recent years is partially explained by Eurostat's requirements. The tables are sent to Eurostat T+36, i.e., 3 years after the end of the reference period.[52] Yet, the availability of data varied by Member States. Eurostat did not publish the information from Bulgaria, whereas the reliable

[52] https://ec.europa.eu/eurostat/web/main/data/database

SUT for Ireland is available only for 2019. In contrast, SUT for Czechia, Luxembourg, and Portugal are available for all the years. While for 2017-2019 SUT were available for most of Member States, data for 2020 was available only for six countries (Table 62).

Table 62: Availability of SUT

	2017	2018	2019	2020	2021
BE	1	1	1	0	0
BG*	0	0	0	0	0
CZ	1	1	1	1	1
DK	1	1	1	0	0
DE	1	1	1	0	0
EE	1	1	1	0	0
IE	0	0	1	0	0
EL	1	1	1	0	0
ES	1	1	1	0	0
FR	1	1	1	0	0
HR	1	1	1	0	0
IT	1	1	1	0	0
CY	1	1	1	0	0
LV	1	1	1	0	0
LT	1	1	1	0	0
LU	1	1	1	1	0
HU	1	1	1	1	0
MT	1	0	0	0	0
NL	1	1	1	0	0
AT	1	1	1	0	0
PL	1	1	1	0	0
PT	1	1	1	1	0
RO	1	1	1	0	0
SI	1	1	1	1	0
SK	1	1	1	0	0
FI	1	1	1	1	0
SE	1	1	1	1	0

Source: own elaboration based on Eurostat.
*Note: for some Member States, use tables are not published annually. * - for Bulgaria the latest available SUT is for 2014.*

The information needed for accurate estimation of the model parameters must be sources predominantly from fiscal registers and unpublished data prepared by the statistical agencies. The remainder of this chapter discusses the completeness and quality of the data received directly from Member State administrations between the beginning of February and the end August of 2023. In general, the received submissions can be classified into four groups that are described below. Table 63 and Figure 79 depict the availability of information by country and provide relevant details.

Submissions with high data completeness and granularity

Belgium, Spain, France, Italy, Latvia, Lithuania, Malta, Czechia, and Slovenia have shared granular and complete data with an approximate level of completeness ranging from 90 percent to 100 percent across all categories of data.[53]

Submissions with medium data completeness and granularity

Bulgaria, Ireland, Finland, Sweden, Poland, Hungary, Luxembourg, and Slovakia submitted data with varying levels of completeness. While they have provided a significant portion of the required data, some categories such as GFCF (for most of the countries) or propex (for Finland) are partially complete or missing in certain instances.

Submissions with low data completeness and granularity

Cyprus, Romania, Estonia, Greece, and Portugal provided less complete data, with completeness levels ranging from 10 percent to 25 percent. These countries either sent outdated information or no information in several categories, hindering a comprehensive assessment of the VAT gaps. In the cases of Germany and Croatia, all of the data provided was outdated.

Countries that did not send any data

The Netherlands and Austria have not submitted any granular and up-to-date data. Consequently, the preliminary calculations were heavily based on the past estimates and information about changes in the rate structure. In the case of Austria, although some data has been received, it has been found to be limited in its usefulness for the purpose of the calculations.

Table 63: Completeness of data shared directly by Member State administrations

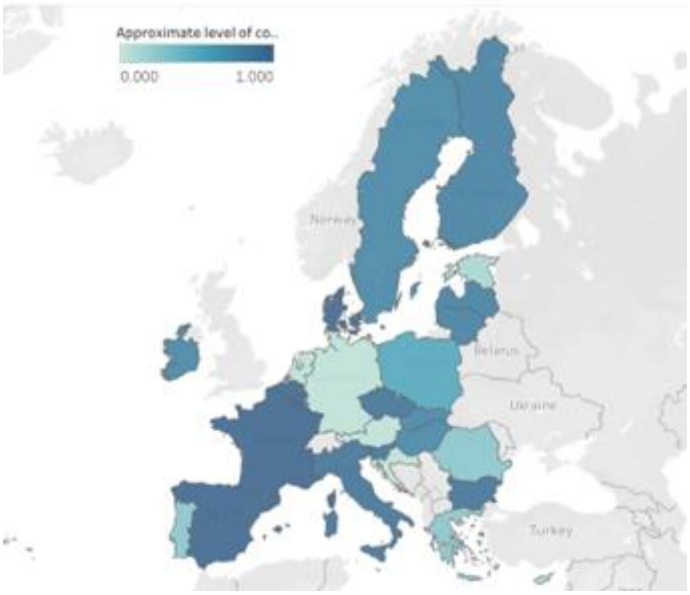
MS	Data received	General impression on data	Approximate level of completeness	Level of completeness by category of data			
				Rates	Propex	Net adjustments	GFCF
BE	yes	high completeness	100%	complete	complete	complete	complete
BG	yes	medium completeness	90%	complete	complete	outdated	complete
CZ	yes	high completeness	90%	complete	complete	partially complete	complete
CY	yes	low completeness	10%	partially complete	outdated	outdated	outdated
DK	no need	x	100%	complete	complete	complete	complete
DE	yes	low completeness	0%	outdated	outdated	outdated	outdated
EE	yes	low completeness	10%	partially complete	outdated	partially complete	outdated
IE	yes	medium completeness	75%	complete	complete	x	complete
EL	yes	low completeness	25%	complete	x	x	x

[53] *100% completeness would mean that the series answering all requests in the questionnaire at a minimum level of required granularity and without gaps was shared.*

MS	Data received	General impression on data	Approximate level of completeness	Level of completeness by category of data			
				Rates	Propex	Net adjustments	GFCF
ES	yes	high completeness	100%	complete	complete	complete	complete
FR	yes	high completeness	100%	complete	complete	complete	complete
HR	yes	low completeness	0%	outdated	outdated	outdated	outdated
IT	yes	high completeness	90%	complete	complete	partially complete	complete
LV	yes	high completeness	90%	complete	complete	partially complete	partially complete
LT	yes	high completeness	90%	complete	complete	most parts are missing	complete
LU	yes	medium completeness	75%	complete	partially complete	partially complete	complete
HU	yes	medium completeness	75%	complete	complete	x	complete
MT	yes	high completeness	90%	complete	complete	partially complete	complete
NL	no	no data	0%	x	x	x	x
AT	no	no data	0%	x	x	x	x
PL	no	medium completeness	50%	complete	x	x	complete
PT	yes	low completeness	25%	complete	outdated	outdated	x
RO	yes	low completeness	25%	complete	outdated	outdated	x
SI	yes	high completeness	90%	complete	complete	partially complete	complete
SK	yes	medium completeness	75%	complete	complete	most parts are missing	complete
FI	yes	medium completeness	80%	complete	partially complete	partially complete	complete
SE	yes	medium completeness	75%	complete	complete	x	complete

Source: own elaboration based on data submissions.

Figure 79: Overview of data completeness by Member State



Source: own elaboration based on data submissions.

VII.b. Data reliability and the impact of the COVID-19 pandemic on the accuracy of estimates

In addition to the inaccuracies related to availability, timeliness, and granularity of information, the accuracy of VAT compliance gap estimates could largely be affected by the content and quality of the information. However, the quality of the aggregate information used in the calculation cannot be fully controlled for. As discussed in the following subsection, the judgment on the quality of information needs to rely on the observation of patterns across time and Member States and the detection of irregularities looking at specific variables or final estimates (for instance of the VAT compliance gap).

In addition to standard concerns about the quality of information used in the estimation of the VTTL and the VAT gaps, there are additional challenges faced by this study that stem from the COVID-19 pandemic and its impact. The main factors impacting the accuracy of the VAT gap estimates in this context are:

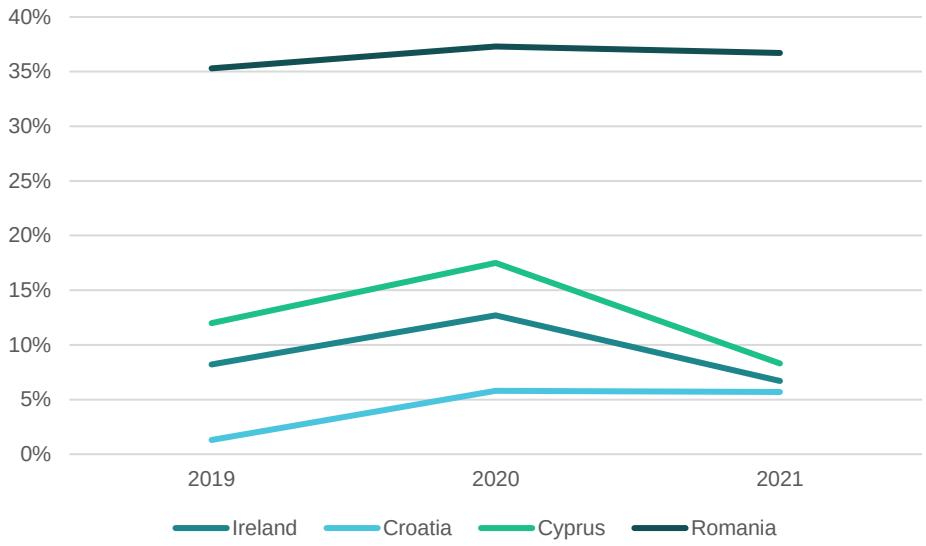
- **Insufficient/inaccurate inclusion of deferred payments in tax base.**
- **Difficulty of compiling and potential inaccuracies in national accounts' statistics.**
- **Temporary changes in tax rates introduced in many Member States.**

To reflect properly forgone revenue, VAT revenue should be aligned with corresponding VAT liability. This means that the VAT revenue used should be recorded in accrual rather than cash terms. More specifically, calculations of the VAT compliance gap for transactions that took place in 2020 should use the revenue collected in 2020 but also in 2021. In accordance with ESA 2010 standards, revenue in the taxes on production and imports are recorded when activities, transactions, or other events occur which create the liabilities to pay taxes, which makes it perfectly suited for the calculation (Eurostat, 2013). Yet, the massive amounts of deferred payments collected in 2021 made

it very difficult to compile the revenue in full accordance with the ESA 2010 principle. For this reason, the study team has scrutinised and consulted potential issues with relevant tax administrations. For two Member States, additional data provided by two administrations was used to correct officially published VAT revenue so that the figures used better reflect accruals.

The assessment of the impact of insufficient correction for deferred payment on the figures presented in this report could be made by looking at the volatility of estimates. A pattern in which the estimated VAT compliance gap suddenly increases in 2020 and drops in 2021 (compared to both 2020 but also to the fast estimates for 2022) could be an indication of insufficient/inaccurate correction for deferred payments. After the correction was made, such a pattern was observed only in four Member States (see Figure 80). Since the pattern is not widespread, and the shifts in these four Member States could well have been caused by other factors, the problems with the inclusion of deferrals had likely a minor impact on the accuracy of VTTL and VAT compliance gap estimates.

Figure 80: VAT compliance gap in Ireland, Croatia, Cyprus, and Romania



Source: own calculation.

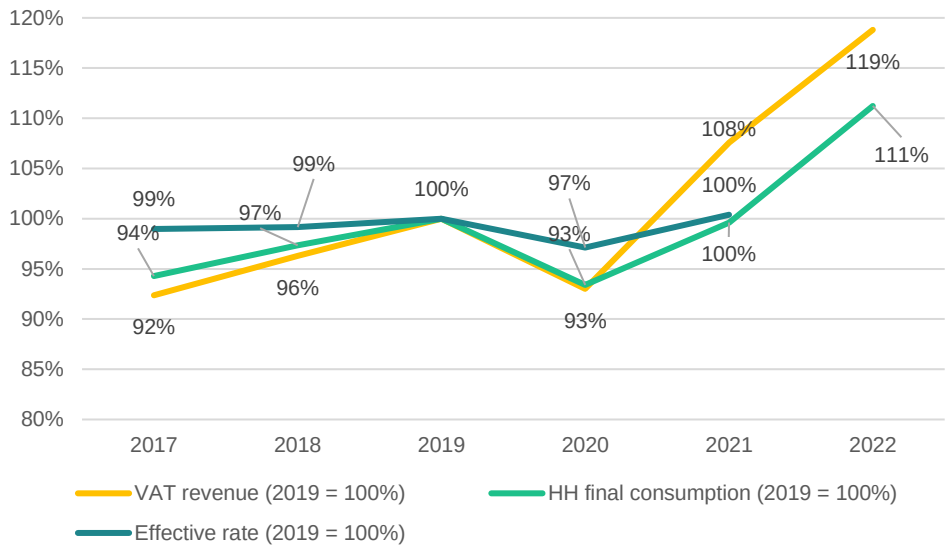
Note: the estimates for Ireland increase in 2020 and drop in 2021

Due to additional problems in surveying companies and households in 2020 due to lockdown measures and the financial problems of economic operators, the estimates of national accounts figures are likely prone to larger errors than in other years. In addition, a number of Member States introduced large temporary changes in their tax rate systems throughout 2020. Since information used for calculating the VTTL is to a large extent available only in yearly terms, the calculation of the effective rates is prone to larger errors than in years when changes in tax rules are introduced from the beginning of calendar year.

The evolution of the VAT revenue, VAT base, and effective VAT rate aggregated for the EU-27 shown in Figure 81 reveals some important patterns that might be somewhat related to the three factors listed above. Firstly, the relative stability of the parameters of the VTTL model (proxied by the VTTL to net household final consumption ratio) that was observed for many years, dropped for 2020 and 2021. In 2020, the effective rate declined by ca. 3 percent, whereas in 2021 it increased by the same proportion and, as a result, it returned to 2019 levels. Changes in the effective rate result from

statutory changes (mostly temporary measures, see Chapter V) and changes in the structure of the EU economies. Due to the volatility observed in the graph, uncertainty around the estimated changes in the VAT compliance gap in 2020 and 2021 is higher than for other years. Secondly, a large divergence of the lines representing the VAT base (proxied by household final consumption) and VAT revenue after 2020 even without looking at the estimates of the VTTL indicate that VAT compliance has substantially improved between 2019 and 2022.

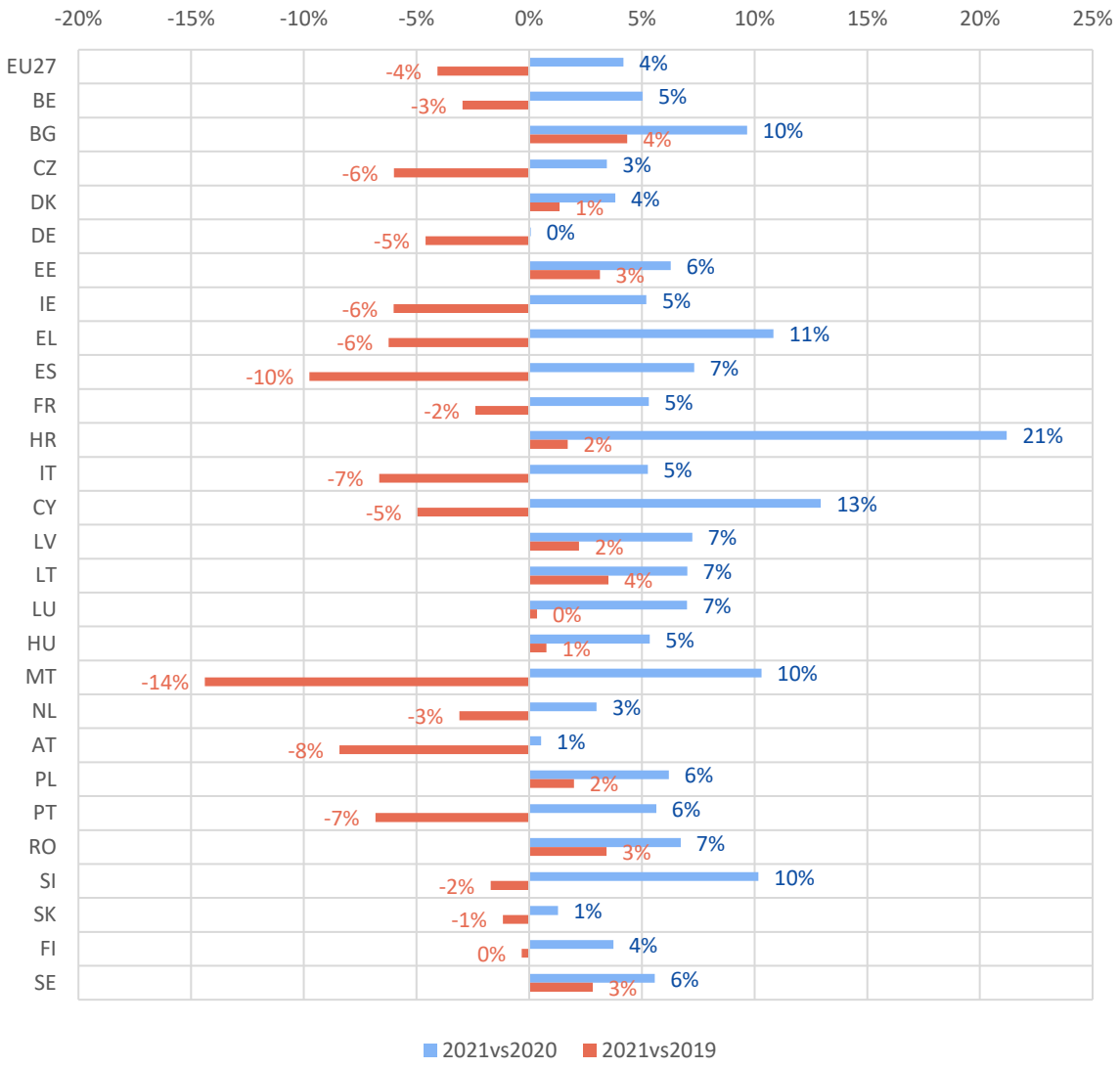
Figure 81: VAT revenue, VAT base, and the effective rate as a percentage of 2019 values (EU-27)



Source: own calculation based on Eurostat.

On top of the volatility of the parameters of the VTTL model, 2020 and 2021 brought large fluctuations in the tax base. In 2020, household final consumption dropped by 7 percent and in 2021 it returned to pre-pandemic levels (in nominal terms, see Figure 81). The volatility of household final consumption figures (a large drop in 2020 and then a large increase in 2021) suggests difficulties of compiling and potential inaccuracies in national accounts' statistics. This appears to be true especially for tourist destination countries such as Malta, Italy, Croatia, Greece, Cyprus, and Portugal where tourism contributes to a large fraction of the VTTL and the volatility of household final consumption was more pronounced (see Figure 82).

Figure 82: Changes in household final consumption (in real terms) between 2021-2019 and 2021-2020



Source: own calculation.

VII.c. Assessment of the credibility of VAT compliance gap estimates by Member States

The availability of data and their timeliness and granularity vary by country which contributes to variation in the accuracy of obtained estimates (see Section VII.a). As shown by EC/CASE (2022), the unavailability of information on specific parameters with a one-year or two-year lag appeared to have a relatively modest impact on the accuracy of estimates (below 1 pp). If the data were unavailable for two years and the parameters remained unchanged for two years in row, the average inaccuracy would increase quite substantially and be approximately 1.6 pp. The unavailability of SUT also appeared to be an important factor affecting the accuracy of estimates. The average error of the estimates using one-year lagged SUT was 0.4 pp, whereas two-year lagged estimates had an average impact of 0.6 pp. As a result of the above, taking a 1 pp average deviation as a subjective accuracy threshold would mean that the estimates with the primary information lagged by two years or more would be above the threshold. If an average inaccuracy of 2 pp from the best possible

estimates is acceptable, the use of three-year lagged information would be outside these arbitrarily set accuracy limits.

In contrast to other basic characteristics of data like availability, timeliness, and granularity, the quality of the aggregate information received by the study team cannot be fully controlled. The reason is that the underlying calculation process and data are not available for the study team. Moreover, most often there are no other similar series or sources of information that could be used for cross-validation. As a consequence, the main tool at the study team's disposal is the observation of patterns in the data that are not in line with economic theory or expectations.

The basic theoretical assumption underlying this assessment is that during periods that are stable in terms of policies and economic situation, taxpayer compliance largely caused by systemic factors remains stable. Thus, large shifts in estimates require special attention. In case of no justification for the shifts, the credibility of such estimates could be questioned.

The relative scarcity of large shifts could be summarised by looking at the tails of the distribution of year-over-year changes in the compliance gap:

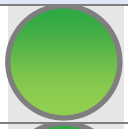
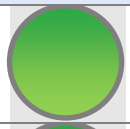
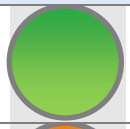
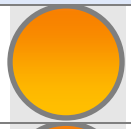
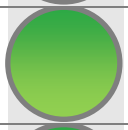
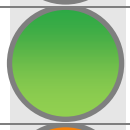
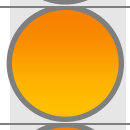
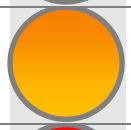
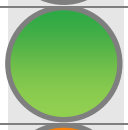
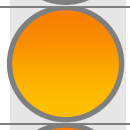
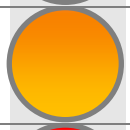
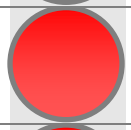
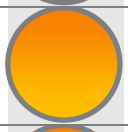
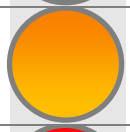
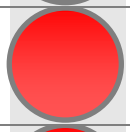
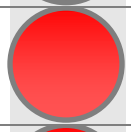
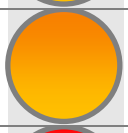
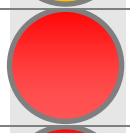
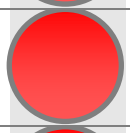
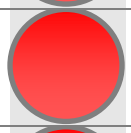
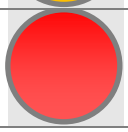
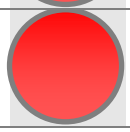
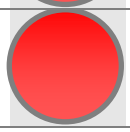
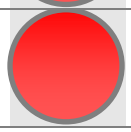
- **A large incline in the gap.** An increase in the gap of over 5.5 pp year-over-year was observed only in 5 percent of instances and an increase of over 11 pp – only in 1 percent of instances.
- **A large decline in the gap.** A decrease in the gap of over 6.8 pp year-over-year was observed only in 5 percent of instances and a decrease of over 9.7 pp – only in 1 percent of instances.
- **One-off hike**. The compliance gap was higher by 5 pp than the average of the values in the preceding and succeeding years in only 5 percent of instances. In 1 percent of instances, the compliance gap was higher by more than 9 pp than the average of the values in the preceding and succeeding years.
- **One-off drop.** The compliance gap was lower by 4.3 pp than the average of the values in the preceding and succeeding years in only 5 percent of instances. In 1 percent of instances, the compliance gap was lower by more than 6.2 pp than the average of the values in the preceding and succeeding years.

Against this backdrop, the study team adopted a multi-angle approach to assigning credibility to the obtained estimates, which consisted of the following rules:

1) The estimates beyond the reasonable magnitude and substantially different than the estimates derived by national administrations would be marked in yellow or red (regardless of other criteria). The estimates within the range of (0-1 pp) of reasonable values would be marked in yellow. The estimates below -1 percent or departing by more than 5 pp from the estimates of tax administrations would be marked in red.

2) The availability of sufficiently granular and timely information would determine the assigned credibility using the findings from the simulation presented in EC/CASE (2022) (see Table 64).

Table 64: Accuracy thresholds for combinations of data unavailability

		Parameters[54]			
		Up-to-date	**One-year lag**	**Two-year lag**	**Three-year lag**
SUT	Up-to-date				
	One-year lag				
	Two-year lag				
	Three-year lag				
	Four-year lag				
	Five-year lag				

Source: own elaboration.

Note: the green light stands for estimates with a mean average error below 1 pp, the yellow light stands for estimates with a mean average error between 1 and 2 pp, and the red light stands for estimates with a mean average error above 2 pp.

3) As large shifts in the gap are rarely observed, all such instances were scrutinised. If these changes cannot be explained, they are marked by the relevant traffic lights, i.e., yellow for fluctuations below the 5th and above the 95th percentile and red for fluctuations below the 1st and above the 99th percentile.

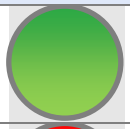
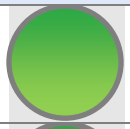
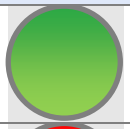
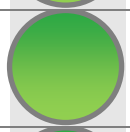
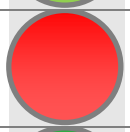
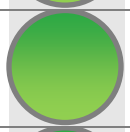
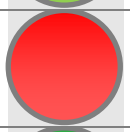
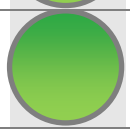
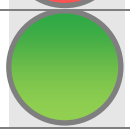
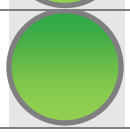
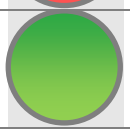
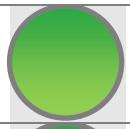
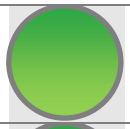
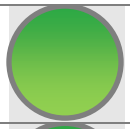
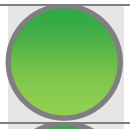
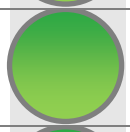
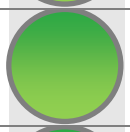
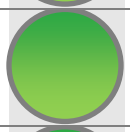
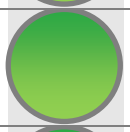
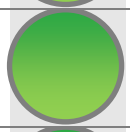
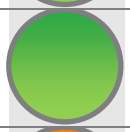
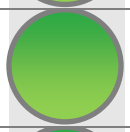
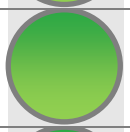
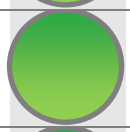
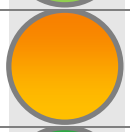
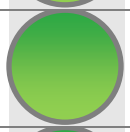
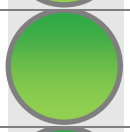
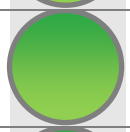
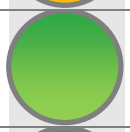
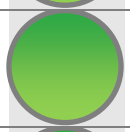
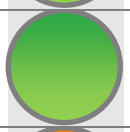
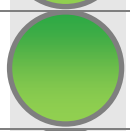
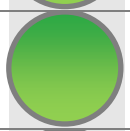
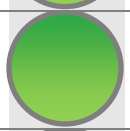
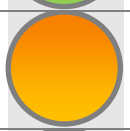
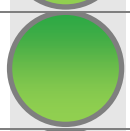
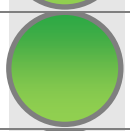
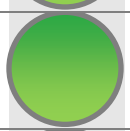
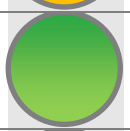
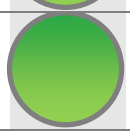
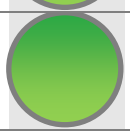
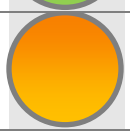
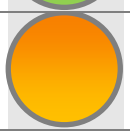
4) In case of multiple problems, an overall assessment was made looking at all the criteria affecting the overall estimate.

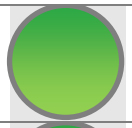
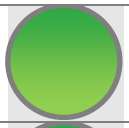
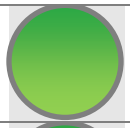
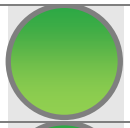
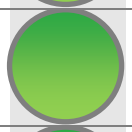
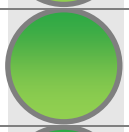
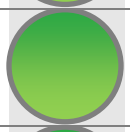
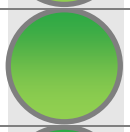
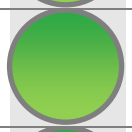
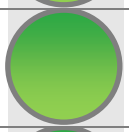
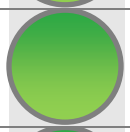
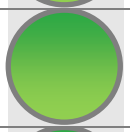
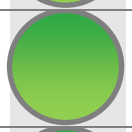
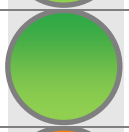
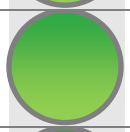
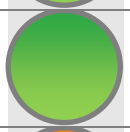
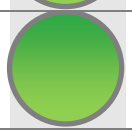
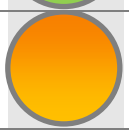
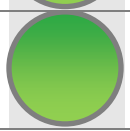
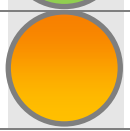
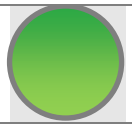
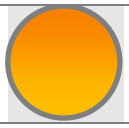
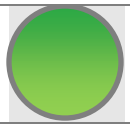
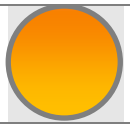
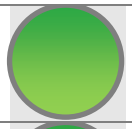
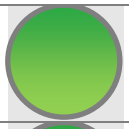
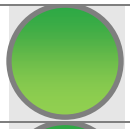
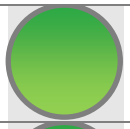
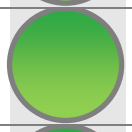
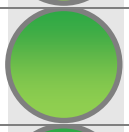
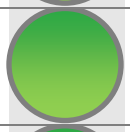
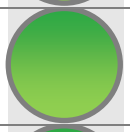
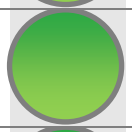
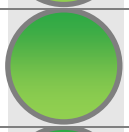
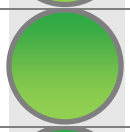
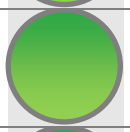
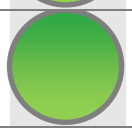
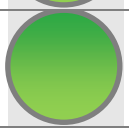
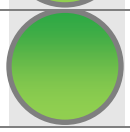
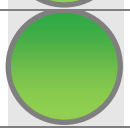
Overall, no significant issues that might have affected the accuracy of the estimates were spotted for 18 Member States (rows marked in green in Table 65).[55] For nine Member States, there are signals that the accuracy of the estimates may be somewhat lower (rows marked in yellow in Table 65). For one of the Member States, Bulgaria, were the problems encountered of a fundamental nature – the most recent use tables were for 2014, which likely had a large impact on the accuracy for most recent years (rows marked in red in Table 65).

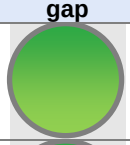
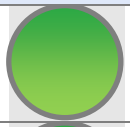
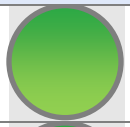
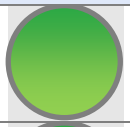
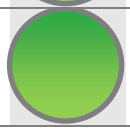
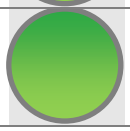
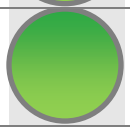
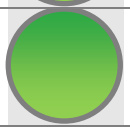
[54] *To reduce complexity, the analysed scenarios of data unavailability assume that all the parameters are available with the same time lag. It may happen that the time lag differs for various parameters. In such a case, the simple average of ime lag in groups of parameters could be used as a proxy of the overall time lag.*

[55] *Please note that the method for this classification is different than in EC/CASE (2022) as it also incorporates the likelihood of solving problems.*

Table 65: Assessment of credibility of VAT compliance gap estimates

	Magnitude of the compliance gap	Data availability	Shifts	Final assessment	Comment
BE					
BG					Most recent use tables available for 2014
CZ					
CY					Large hike in 2020 and decline in 2021, which may be somewhat affected by deferred payments or other elements that were not fully controlled in the modelling. Outdated parameters (by one year) and SUT (2019).
DK					
DE					
EE					
IE					SUT for 2017 and 2018 backcasted using 2019 data
EL					
ES					Significant revisions of national accounts expected
FR					
HR					Large one-off decline in 2019 that cannot be explained.

	Magnitude of the compliance gap	Data availability	Shifts	Final assessment	Comment
IT					Very large decline in 2021. Although this shift was confirmed with the Italian authorities, it may have been a signal of deferred payments.
LV					
LT					
LU					
HU					
MT					Most recent use tables available for 2017.
NL					Slightly negative value for 2021 (-0.22). Outdated parameters (by one year) and SUT (2019).
AT					Outdated parameters (by one year) and SUT (2019).
PL					Large decline in 2021, which may be somewhat affected by deferred VAT payments.
PT					
RO					
SI					
SK					

	Magnitude of the compliance gap	Data availability	Shifts	Final assessment	Comment
FI					
SE					

Source: own elaboration.

VII.d. Review and reassessment of the methodological approach

EC/CASE (2022) contained a comprehensive assessment of various aspects related to the continuation and development of the *VAT gap in the EU study*. In the view of the discontinuation of the ORS, it assessed possibilities for substituting or complementing the methodology that has been used up to 2022. The assessment was based, among others, on the information on data availability from the questionnaires shared with Member State administrations. The assessment also used the result of the simulation assessing the impact of data unavailability on the accuracy of the VTTL estimates in different time horizons. According to this assessment, the accuracy of estimates for 80 percent of estimates was expected to remain unchanged compared to the 2022 study despite the discontinuation of the ORS. The study concluded that the top-down consumption side approach was the only single-method approach that allowed for the full coverage of 27 of EU Member States. Although some additional analytical components covering only selected Member States are possible, the calculation based on the top-down consumption side approach only is the least costly approach to execute that will allow for continued monitoring of the size and trends in the VAT compliance gap in all Member States.

This study supported the projection from the earlier analysis. Around 60 percent of the overall information used earlier for estimating model parameters was made available for the study team. The information needed to estimate the most important parameters was available, sufficiently granular, and up-to-date for over 80 percent Member States. Overall, the number of Member States with the accuracy of estimates marked in red decreased (from two to one thanks to the availability of new use tables for Malta). The number of Member States assigned a yellow flag increased from four to nine.

This indicates that the accuracy of estimates has not decreased dramatically and that the continuation of the top-down consumption-side approach is still the only method that could be employed for all Member States. The exchanges with Member State administrations signalled that the vast majority of Member States continue gathering relevant data and are in a position to share them. For these Member States, the accuracy of estimates will be maintained. Yet, for Member States that have not shared the information necessary for the calculations presented in this study and this information will remain unavailable, the accuracy of estimates will gradually drop. It may be expected that the estimates for the group of ca. five Member States will decline and will be marked in red in a one- or two-year time horizon.

VIII. Web front-end and dissemination

The 2022 edition of the *VAT gap in the EU study* assessed the pros and cons of employing some of the best practices in designing web front-ends and the dissemination practices of major institutions publishing in the field of economics (the OECD, EU institutions, the World Bank, and the International Monetary Fund). Based on this review, the study team prepared a list of potential approaches and proposed a set of three design options for future publications. The web front-end of the 2022 study has not changed substantially compared to previous years. It retained the format of a simple factsheet but is now supplemented with a map. To expand last year's work, the study team analysed the web traffic statistics shared by the European Commission. This section also provides an updated review of best practices, based on the most recent reports of major publishing institutions. The study team's level of involvement in the web design itself and the development of the final solution depends on the arrangement with the Commission and the technical limitations to accessing and modifying its website. Regardless of those arrangements, the study team will provide the concept and data inputs.

In the previous edition of the *VAT gap in the EU study*, the team presented a review of the contents and means of dissemination used by major publishing institutions (the OECD, EU agencies, the World Bank, and the International Monetary Fund). The main purpose of this review was to gain a better understanding of various publication strategies and the best practices and limitations of different approaches. The summary of the review is presented in the table below.

Table 66: Review of contents of web front-ends used by major publishing institutions

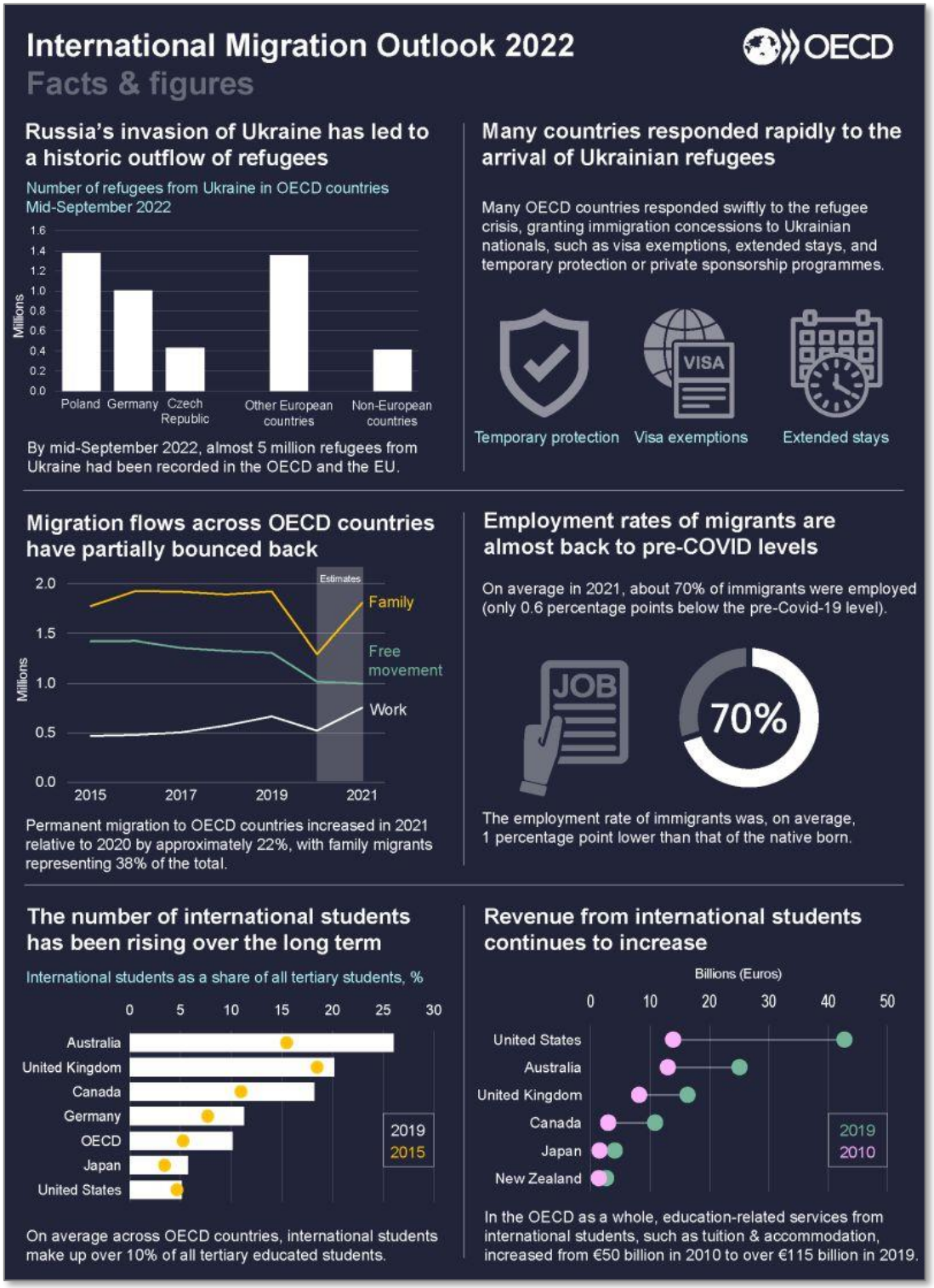
	Publishing institution			
	OECD	**European Commission and other EU institutions**	**World Bank**	**IMF**
Executive summary / general description of the publication	yes	yes	yes	yes
Highlights of the most important findings	yes	yes	yes	sometimes
Description of the methodology	sometimes	sometimes	no	no
Simple static graphs and tables	yes	yes	yes	sometimes
Interactive graphs and tables	sometimes	sometimes	sometimes	no
Chart creator	no	sometimes	sometimes	no
Links to source data	yes	yes	yes	yes
Links to the report in pdf format	yes	yes	yes	yes

	Publishing institution			
	OECD	**European Commission and other EU institutions**	**World Bank**	**IMF**
Links to the report in other formats	sometimes	no	no	no
Report available in printed version	sometimes	no	no	sometimes
Report available through research repositories	sometimes	sometimes	sometimes	sometimes
Report cover contains a picture	yes	sometimes	sometimes	no
Video summary / video discussion / presentation	sometimes	no	no	sometimes

Source: own elaboration.

In order to supplement last year's in-depth analysis of best practices, the team analysed examples of web front-ends published since the publishing of the last report. One example is the OECD's *International Migration Outlook 2022.* The full body of the report is available in a pdf format as well as an html version, which makes it more accessible for mobile users. The web front-end for this particular report is constructed around a single page infographic (see Figure 83). The most important insights of the report are presented in a 2x3 grid format where each conclusion is accompanied by a simple plot or graphic. This single page infographic format is contrasting the interactive approaches where the user is required to filter the information for their own needs – here all the information is presented in a single place. The simplicity of this particular approach makes it convenient for communication on social media platforms where the majority of users expect to get the most important information quickly and without leaving the platform.

Figure 83: Screenshot of *International Migration Outlook 2022* web front-end

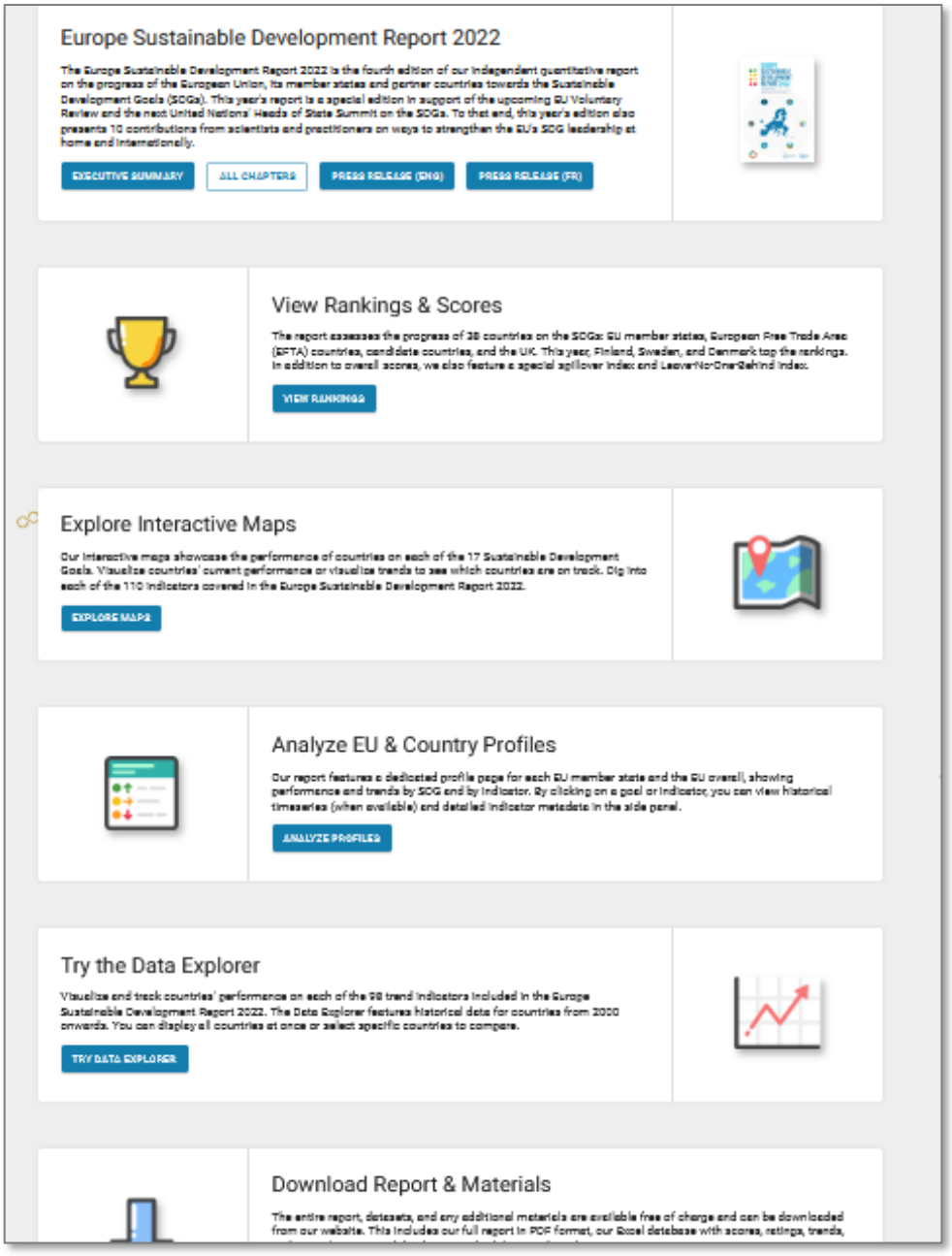


Source: https://www.oecd.org/migration/international-migration-outlook-1999124x.htm.

Another example of a web front-end published since the last review of best practices is the *Europe Sustainable Development Report 2022* report by the UN's Sustainable Development Solutions Network (see

Figure 84). The web front-end for this report consists of six main tabs which lead readers into specific parts of the presentation. Some of these parts are designed to present high-level information (such as Country Ranking and Interactive Map) while others (such as Data Explorer) cater to more engaged readers who want to investigate detailed results. This example of a web front-end shows that it is possible to present different levels of detail and allow the user to choose the preferred one. At the same time, the reader might not be able to understand the relationship between those separate means of presentation.

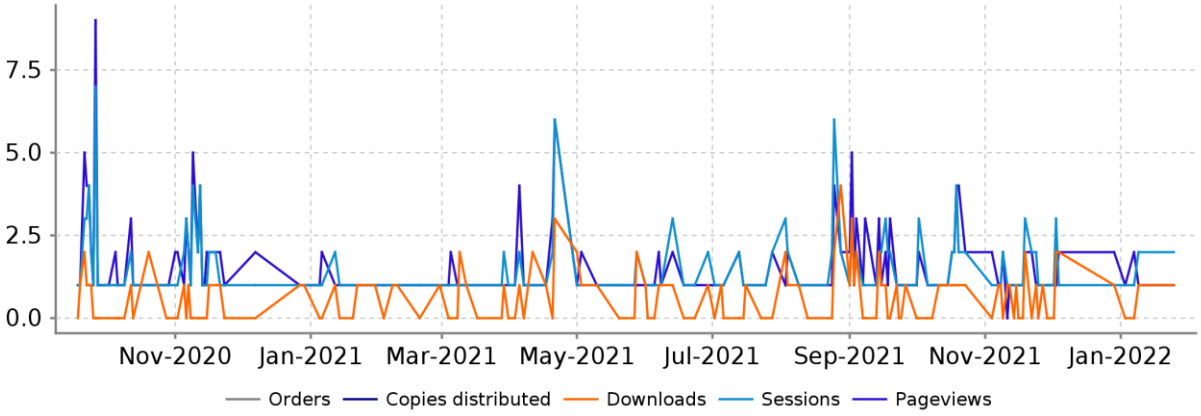
Figure 84: Screenshot of *Europe Sustainable Development Report 2022* web front-end



Source: https://eu-dashboards.sdgindex.org/.

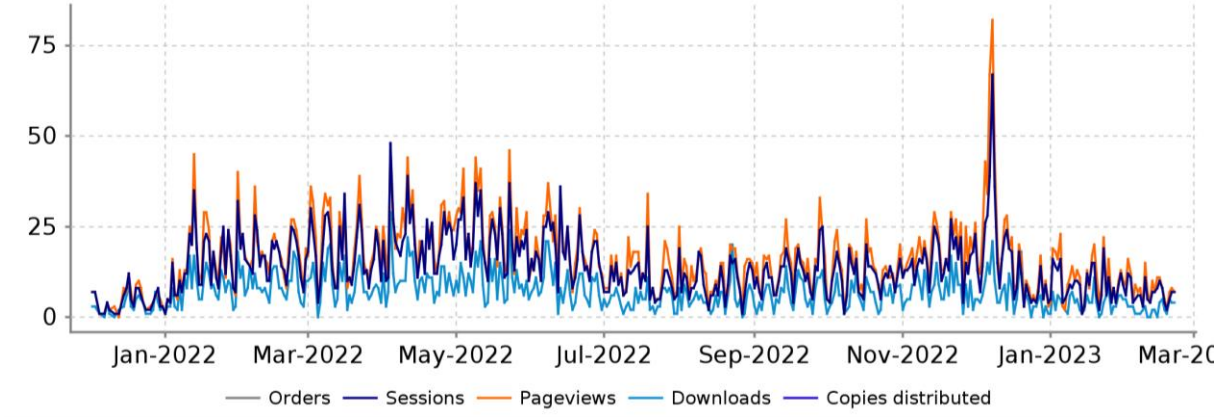
Web traffic statistics can be a useful tool for gaining a basic understanding of the type and size of an audience of a given web content. The study team was provided with statistics on web traffic for web front-ends for the 2020, 2021, 2022 editions of the *VAT gap in the EU* study.

Figure 85: Publication indicators for 2020 edition of the VAT gap study



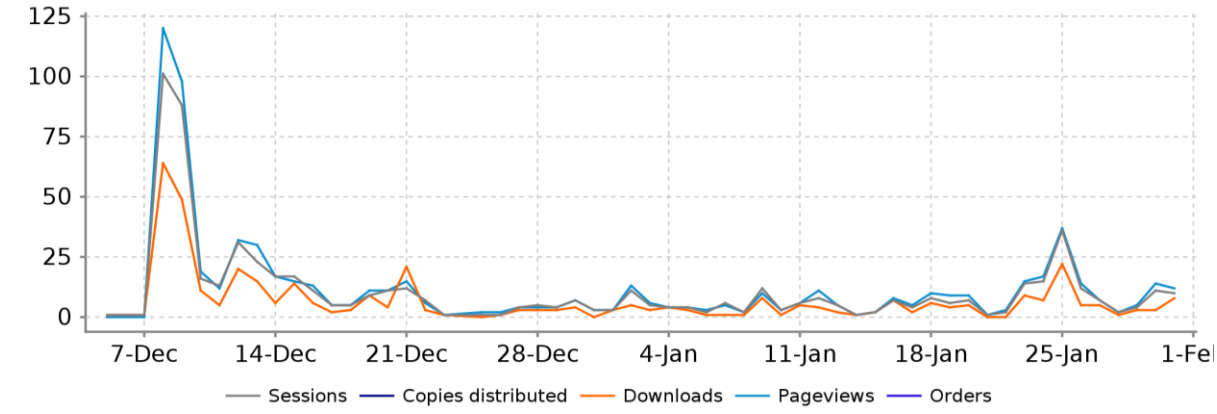
Source: Publications Office of the European Union.

Figure 86: Publication KPIs for 2021 edition of the VAT gap study



Source: Publications Office of the European Union.

Figure 87: Publication KPIs for 2022 edition of the VAT gap study



Source: Publications Office of the European Union.

The statistics include the number of pageviews, sessions, and downloads in various dimensions such as time, country, language version of the browser, and platform, among others. Even though the statistics contain only basic information, they yield some important insights. First, it is important to note that the numbers of pageviews for the 2020 edition of the study are considerably lower (see Figure 85) than for the other two – 245 views in total compared with 7 095 and 682 (based on 2 months only) for the 2021 and 2022 editions, respectively. The highest daily number of pageviews of the web front-end of the 2020 edition was observed on the first day after publication and it reached only 8 views. Overall, the sample size of this time series is too low to give much insight into time trends and country distribution, among others, thus, the rest of this analysis will be based on the data from the 2021 and 2022 editions.

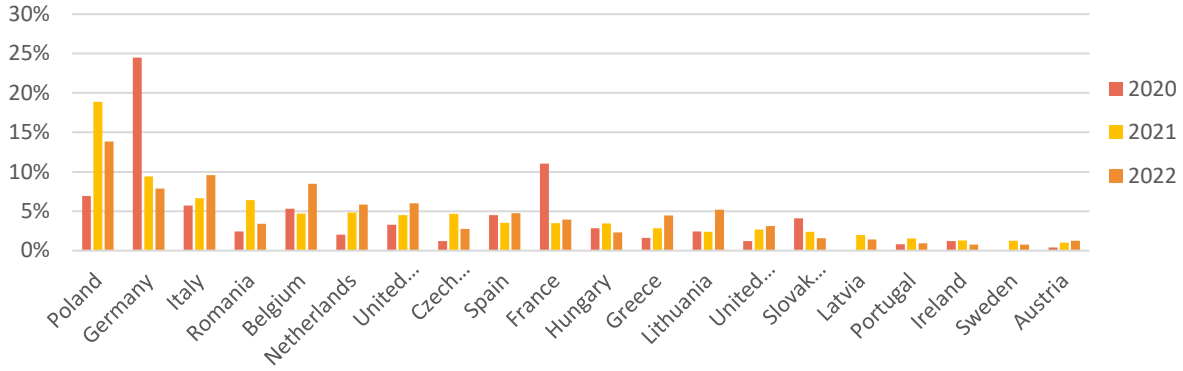
Regarding the 2021 edition of the study, there was relatively little interest in the first days after publication (which happened in December of 2021, see Figure 86). The number of pageviews picked up around January 2022 and it was stable though the whole year, with around 10-20 visitors per day. The exception was a peak around December 2022, at the time when the next edition of the report was published. It is possible that some visitors intended to view 2022 edition of the report but instead used the old link.

The web front-end for the 2022 edition of the *VAT gap in the EU* study was viewed and downloaded the most right after its publication, with the peak exceeding 100 views in a day (see Figure 87). This peak of interest was most likely the effect of a coordinated campaign on December 8th, when the news of its publishing was shared on the European Commission's social media channels and the associated conference was streamed on the "Europe by Satellite" channel. This shows that such campaigns can have a great impact on the reach of the *VAT gap in the EU* study results and that the first few weeks after publication are crucial. After the first few days of higher pageviews, the numbers dropped and levelled off to a range of 0 to 30 views per day.

When it comes to language of the browser used by people accessing the web front-end, unsurprisingly English is by far the most popular with around a 40 percent share (both in the 2021 and 2022 edition of the report).

The country distribution of visitors is a little bit more surprising (see Figure 88) – the most pageviews for the 2021 and 2022 web front-end comes from Poland (almost 19 percent of pageviews for the 2021 report and 14 percent for the 2022 report). Given that the subject of the VAT compliance gap has gained a lot of political relevance in Poland it can be assumed that the relative popularity of the VAT gap report can be in some way associated with this subject in the political debate. Further down the list, there is more variation – concerning the 2021 edition, a large share of the views came from Germany (9 percent), Italy (7 percent), Romania (6 percent), and the Netherlands (5 percent). For the 2022 report, viewers predominantly came from Italy (10 percent), Belgium (9 percent), Germany (8 percent), and the United States (6 percent).

Figure 88: Share of total number of web front-end pageviews by country



Source: Publications Office of the European Union; note that number of pageviews for 2020 edition of the report was relatively small throughout the whole analysed period and that 2022 edition data is based on much shorter period (about 2 months).

In the 2022 edition of the *VAT gap in the EU* study, three design options were presented: status quo, moderate expansion, and state of the art. Further analysis of the practices paired with the data on web traffic reinforces previous conclusions – in the view of the study team, the best option is the moderate expansion of the web front-end. The improved appeal of the presentation paired with a higher amount of presented information can increase traffic and the engagement of users, helping to spread information on the issue of the VAT compliance gap. At the same time, the state-of-the-art solution is most likely expensive too and requires a long development time – considering current web traffic, such a solution seems to be unnecessary.

LIST OF TABLES

LIST OF GRAPHS

List of acronyms and abbreviations

B2B	Business-to-Business
B2C	Business-to-Consumer
CASE	Center for Social and Economic Research (Warsaw)
COICOP	Classification of Individual Consumption according to Purpose
CPA	Statistical Classification of Products by Activity in accordance with Regulation (European Commission) No 451/2008 of the European Parliament and of the Council of 23 April 2008
DG BUDG	Directorate-General for Budget
EKÁER	Electronic Public Road Trade Control System
EC	European Commission
ESA	European System of Accounts
EU	European Union
EU-27	Current Member States of the European Union, UK exclusive
EU-28	Member States of the European Union until January 2020 (including the UK)
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GOV	Government Final Consumption
HBS	Household Budget Surveys
HHC	Household Final Consumption
HICP	Harmonised Index of Consumer Prices
IC	Intermediate Consumption
IOSS	Import One-Stop Shop
IMF	International Monetary Fund
MIMIC	Multiple Indicators, Multiple Causes (model)
MS	Member States of the European Union
MTIC	Missing Trader Intra-Community
NACE	(fr.) *Nomenclature statistique des activités économiques dans la Communauté européenne*
NPISH	Non-Profit Institutions Serving Households
OECD	Organisation for Economic Co-operation and Development
ORS	Own Resource Submissions
OSS	One Stop Shop
pp	percentage points
R&D	Research and Development
SAF-T	Standard Audit File for Tax
SENT	(pl.) *System Elektronicznego Nadzoru Transportu*
STIR	(pl.) *System Teleinformatyczny Izby Rozliczeniowej*

SUT	Supply and Use Tables
VAT	Value Added Tax
VTTL	VAT Total Tax Liability

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Annexes

Annex A. Methodological appendix

VAT gap fast estimates for 2022

The methodology used to derive fast estimates, for which full-fledged estimates could not be derived at this stage of the study due to the unavailability of the data necessary to calculate the VTTL, differs markedly from the one employed to derive the full-fledged estimates for the 2017-2021 period. The methodology for deriving fast estimates shall be regarded as an extrapolation of the main liability components of the full-fledged estimates derived for 2021. In the estimation it will be assumed that:

- Structure of household final consumption does not change with respect to the preceding year.
- Non-deductible GFCF liability changes in line with the year-over-year change in government GFCF published by AMECO.[56]
- In the vast majority of cases where there are no significant changes in the statutory rates, net adjustments and intermediate consumption liability will be rescaled from the preceding year using growth rates for the entire tax base.

VAT revenue decomposition

As VAT revenue is the difference between the VTTL and the VAT compliance 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:

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

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

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

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 (EC/CASE, 2021).

VAT compliance gap backward update: 2000-2016

With the exception of the 2013 VAT gap study, each of the subsequent updates covered estimates for five-year periods. Overall, the VAT compliance gap estimates have thus far covered 2000-2020.

[56] See: https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco_en.

Yet, due to revisions triggered by new information available, the estimates from different studies cannot be directly compared. Publishing the exact values obtained in various studies in one table, without applying the necessary corrections, could lead to a misinterpretation of the year-over-year changes in the VAT compliance gap resulting from structural breaks.

There are three different sources of backward revisions to the VTTL estimates applied every year:

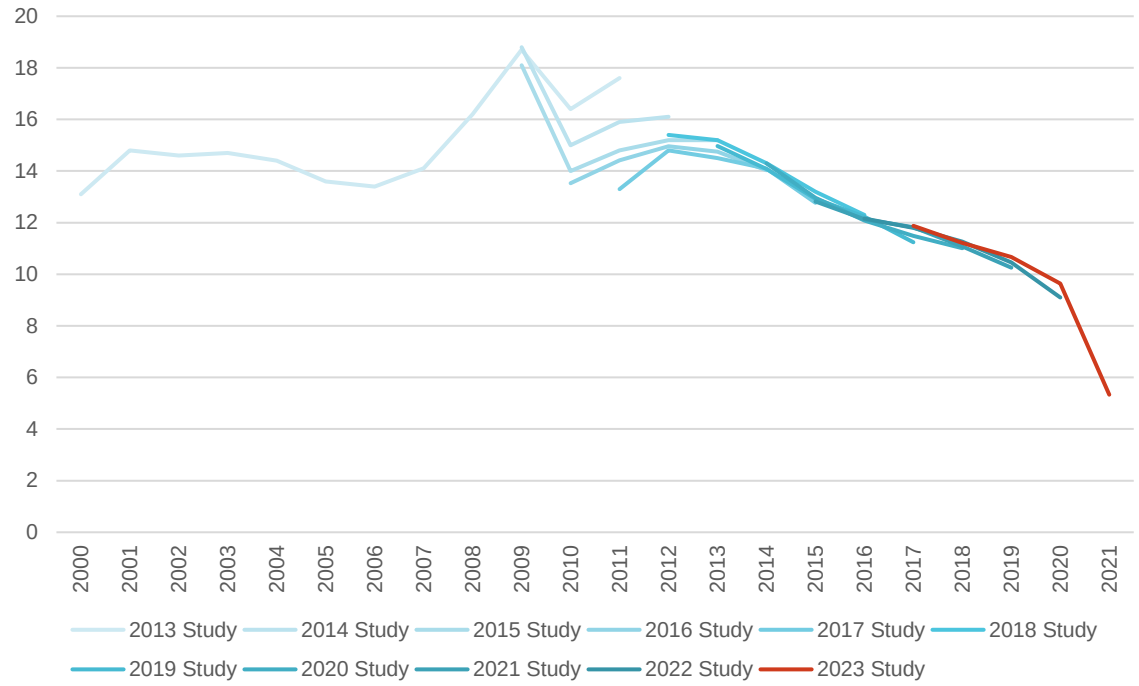
1) Updates in the underlying national accounts data published by Eurostat: updates in VAT revenues, new supply and use tables, and revised industry-specific growth rates, among others.

2) Updates in the estimated GFCF liability, based on the new information from the own resource submissions (ORS) 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: effective rates, pro-rata coefficients, and net adjustments, either due to new information from ORS or due to correcting errors in the previous computation.

As visualised by Figure 89 for the total EU-wide VAT compliance gap, despite some revisions in magnitude of the most recent year, the dynamics of the series were largely unaffected by revisions. Bearing in mind that the updates in the calculation of the VTTL do not impact year-over-year changes, the study team implements, so called, backcasting procedure for deriving past estimates of the VAT compliance gap for every Member State. The backcasting procedure relies on the magnitude of values for the five-year period covered by the most recent estimates. At the same time, the dynamics, i.e., year-over-year changes, for the years not covered by the full estimates would be based on previous studies (the most recent study available including the specific years). Overall, the estimates for 2000-2016 included in this study rely on the ten studies published between 2013 and 2022 but are adjusted to the magnitude of the full estimates for 2017-2021.

Figure 89: Comparison of results (% of the VTTL, 2000-2021)



Source: own elaboration based on European Commission, CASE (2013-2023), download underlying data.

Limitations and challenges of the top-down approach

Table 67: Limitations and challenges of the top-down VAT gap calculation

Limitations and challenges	Impact on the accuracy of estimates and means to address the challenge
Dependence of the accuracy of estimates on the inclusion of the unobserved economy and accounting for fraud	The top-down method hinges on underlying national income accounts, respective conventions, and quality. The unavoidable inaccuracies related to the underlying data impact the accuracy of estimates. Yet, the methodological approach taken by the statistical authorities, i.e., the strict rule of the ESA 10, as well as parallel use and triangulation of at least two out of the three approaches – production, expenditure, income-side – to the compilation of national accounts, reduce this error. Nevertheless, insufficient correction for the activities that are unobserved by statistical agencies could lead to underestimation of the VAT compliance gap.
Decomposition of the VAT compliance gap	Since VAT liability is modelled both for groups of products (for the liability pertaining to final use categories) and for sectors of economic activity (correction for the liability at the intermediate stage), it is not possible to decompose the VAT compliance gap. The consumption-side approach allows only for estimating the overall value of the gap. To decompose the VAT compliance gap, the production-side approach must be applied, and sectoral revenue data needs to be available. Since it is impossible to align VAT liability components with the

Limitations and challenges	Impact on the accuracy of estimates and means to address the challenge
	respective VAT revenue elements, the consumption-side approach does also not provide any information about types of irregularities and their scale.
Misalignment of VTTL estimates with revenue figures	The issue of the misalignment of the timing of recording transactions in national accounts and VAT receipts has been solved to a large extent by the introduction of the ESA 10 standard by Eurostat. Under this standard, the revenue shall be presented in accrual form and account for the change in the stock of refunds and late payments. Yet, due to limitations of observing these flows, revenue published by Eurostat is imperfect accrual.
Misalignment of the place of supply rules with national accounts conventions	Specific services (e.g., transport and tourism) can be taxed not at the place of residence of the taxpayer (as transactions are recorded in national accounts) but at the origin of the provider or where services are physically performed. To reduce the impact of this misalignment, particular components of consumption are adjusted to meet the place of supply rules in place.

Source: own elaboration.

Improvements to the VTTL estimation

This section describes the attempts made to improve the estimation of the VTTL by improving the forecast of household consumption structure (compared to the method used in preceding studies). These actions were triggered by the economic developments in 2020 and 2021 and current data availability. More specifically, in order to estimate the VTTL, the use tables have to be forecasted, in most cases, for the two last years (see Table 68).

Table 68: Use tables availability (July 2023)

	t-2	***t-1***	***t***
Year	**2019**	**2020**	**2021**
No. of MS with SUT available	25	6	0

Source: own calculation based on Eurostat data. Note for 2023 study t = 2021.

The use table (69 users columns x 65 product rows' matrix) consists of the intermediate consumption of 65 industries, the final consumption of three sectors (households, NPISH and government), and capital formation broken down by 65 products, according to the CPA 2008 classification. Depending on the available information, we apply different methodologies to forecast specific industries, as discussed below.

For intermediate, final NPISH, and final government, only information on the total growth rates is available. Therefore, the structure of consumption across products for these industries uses the values observed for the preceding years. However, for final consumption of households, in addition to the total growth rate, the information on the changes of the structure of consumption according to

47 codes of the COICOP 3-digit classification was available for 2020 and 2021.[57] This information can be used to account for changes in the consumption structure across groups of products and services. The problem with correspondence arises since the classification of products and services in CPA and COICOP cannot be matched using a simple key.

The correspondence matrix that would allow us to compute CPA values from COICOP values typically varies by Member State and year. In theory, it should be known to national statistical institutes, since it is used in the production of national accounts; however, it is not officially published by most of them. Thus, considerable literature is devoted to the estimation of the CPA-COICOP correspondence in the absence of official publications, e.g. Cai and Vandyck, 2020; Cazcarro et al., 2020.

We have analysed how the choice of a specific forecasting method for household consumption impacts the accuracy of the household liability estimates. The three methods were: our former approach (no use of COICOP data), our current approach (using ad hoc correspondence for parts of CPA), and an alternative approach proposed in the literature (using the full CPA-COICOP correspondence matrices estimated by other researchers for a certain year).

Method 1: single growth rate (former approach). Under this approach, household final consumption for each CPA category is forecasted with the single growth rate for all the CPA codes. The information from the COICOP-based table is ignored. While this method may be suitable during stable economic periods, it can lead to larger inaccuracies in times of structural changes in consumption, as during the COVID-19 pandemic.

Method 2: ad hoc CPA-COICOP matching (approach used in the 2022 *VAT gap in the EU* study and currently). This approach matches particular groupings of CPA and COICOP categories to calculate specific COICOP-based growth rates for matched categories in an ad hoc way. This ad hoc correspondence was used to obtain specific growth rates for 19 CPA categories. Then, for the remaining unmatched 36 CPA products, we applied a single residual growth rate that would balance the total consumption growth rate (i.e., so that the sum of forecasted household consumption by all products matches the known total for 2020 and 2021).

Method 3: Under this approach, CPA-COICOP contingency matrices (also called bridge matrices) published by **Cazcarro et al.** (2020) are used to forecast CPA from COICOP. In the case of eight Member States, the authors use official year 2010 contingency matrices published by national statistical institutes. For 20 other Member States, the authors calculate contingency matrices using the RAS method[58] applied to one of the chosen eight published matrices. The authors provide evidence that their results supersede those published by Cai and Vandyck (2020), where the count-seed RAS method was used.

Comparison of accuracy

To select the best approach, we compared the household final consumption liability calculated using the latest actual values published by Eurostat with the liability calculated using the forecasted

[57] *Source: nama_10_co3, Eurostat.*

[58] *The RAS method is an iterative proportional fitting procedure used in a situation when only row and column sums of a desired input-output table are known.*

values obtained by the three methods discussed above. The *relative error = abs((actual-forecasted)/actual*100%)* was calculated for each method and Member State (see Table 69).

Table 69: Relative error in household liability: actual vs. forecasted values, +/- pp.

MS	Year	Method		
		Single Growth (former method)	Ad hoc matching (current method)	CPA-COICOP contingency matrices
AT	2019	0.46	0.29	0.64
BE	2019	0.04	0.03	0.20
CY	2019	0.76	1.66	0.29
DE	2019	0.08	0.08	1.03
DK	2019	0.21	0.44	0.17
EE	2019	0.25	0.76	0.17
ES	2019	0.43	0.15	0.02
FR	2019	0.94	0.45	0.48
EL	2019	0.03	0.17	1.41
IT	2019	1.14	0.58	3.29
LT	2019	0.10	0.24	1.14
LV	2019	0.45	0.32	0.91
NL	2019	1.12	0.87	0.98
PL	2019	0.81	0.07	1.22
RO	2019	0.03	0.20	1.16
SK	2019	0.67	0.61	0.20
FI	2020	2.54	0.59	0.36
HU	2020	0.95	0.71	0.75
PT	2020	1.13	1.89	0.24
SE	2020	0.81	0.58	0.47
Average error		**0.66**	**0.55**	**0.76**
Average error for 2019		**0.47**	**0.43**	**0.83**
Average error for 2020		**1.36**	**0.94**	**0.45**

Source: own calculation.

For example, for Austria, we calculated that the household liability based on the values forecasted by the single growth rate method deviates by 0.46 percent from the actual value. For the ad hoc method and for the CPA-COICOP contingency matrices method, the deviation was 0.29 percent and 0.64 percent, respectively. Thus, for Austria, the ad hoc method performed better than more sophisticated approaches. Overall, we find the average relative error was the smallest for the ad hoc method (+/- 0.55 pp), followed by the single-growth rate (+/- 0.66) and then by the method of the CPA-COICOP contingency matrices (+/- 0.76). However, for four Member States for which the 2020 data were available, when the changes in the structure of consumption were greater, the method of Cazcarro et al. (2020) performed best. We conclude that the currently employed forecasting method for household consumption is an improvement over the former approach. However, we await the availability of 2020 use tables for all Member States to draw a conclusion on whether methods based on externally estimated matrices should be employed.

Annex B. Reviews and responses to reviews

Review of the inception report by Norman Gemmell

COMMENT	RESPONSE
Norman Gemmell Professor of Public Finance, Wellington School of Business & Government, Victoria University of Wellington, Wellington, New Zealand	
VAT Gap Estimation Methods The methods proposed for 2023, as with previous years, are set out in equations (1) to (5) on pp.7-9, and equations (6) to (9) on pp.12-13, of the Inception Report. These are well-recognised, establish approaches to VAT gap measurement and in my view remain the 'gold standard' of such approaches. A particularly helpful aspect of recent and proposed methods is the separate identification of the Compliance Gap and the Policy Gap. This allows tax policy advisers to target potential VAT structure reforms at specific aspects and monitor whether and how measured VAT gaps respond. It is essentially a helpful diagnostic tool to decompose the sources of 'missing revenues'. While there is some debate in the profession over whether the two gaps should be treated 'multiplicatively' or 'additively', the latter approach is preferred here and seems appropriate for the proposed calculations across all EU countries. 1 Note that there are two equations labelled '(8)' on p.12 and 'Keen (2013)', mentioned in footnote 4, is missing from the References.	We corrected the wrong label. We are also planning to expand the description of the interlinkages between various components of the policy gap (in the interim and final reports).
Change of Data Source Clearly the biggest change in the methods applied to the proposed 2023 edition of the VAT gap report arises from the enforced need to create and rely on a new dataset due to the cancellation of the previous Own Resource Submissions (ORS). This was previously the core source of information for estimating parameters of the VAT Total Tax Liability. As the Inception Report notes, its absence now "is likely to negatively affect the accuracy of the estimates". Instead the 2023 estimates will need to reply on survey questionnaire responses from country authorities, to provide the data requested to enable on-going VAT gap estimates to be produced.	Thank you very much for this reassurance.

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While it would seem that this new approach is the best available data gathering option, given the withdrawal of the ORS source, I would suspect that this will compound uncertainties around reliability already associated with such tax gap estimation methods. Encouragingly, the study team are well aware of these issues and appear to have suitable plans in hand to interrogate the new data sources, compared to the ORS. My observation on this would simply be that it will be vital to test the new approach against the ORS approach to the maximum extent possible. Of course this is hampered by the loss of ORS-sourced data for 2023 but seeking equivalent 'new questionnaire' data for the last ORS year may be an avenue worth exploring to compare alternative 2021 estimates. The main concern here is perhaps that the reliability of the new data source is likely to vary by country. Partly this is due to the differences in data availability by country (see, for example, Table 5) but also the different competencies and commitment to the new data gathering process by different country authorities. In this context, application of a red/orange/green sticker indicating data quality may be helpful and reflect the study team's 'judgements' of countries' apparent willingness or ability to engage with the new data gathering process. Clearly the team are aware of this when they state (p.20): "To maximise the time available for investigating the potential reasons for some estimates' low credibility, the study team will begin scrutinising these problems during the data-gathering phase". More generally, the Inception Report shows good awareness of the likely risks of inaccuracies in the new VAT gap estimates, such as in section II.	
Accuracy of Tax Gap Estimates In addition to recognising the potential for inaccuracies in the VAT gap estimates, especially differences in degree across countries and industries, the Report is aware that the change to the data source discussed above, will impact on tax gap estimate accuracy. The Report is careful to weigh these up, with suitable caveats to interpretation. For example, the Report notes: "The accuracy of 'fast estimates', compared to the full results for years prior to 2020, was imperfect but good enough to predict, with reasonable confidence, the direction	Unfortunately, the inaccuracy of estimates is caused mostly by the factors beyond our control and the measurement error cannot be quantified (or we have insufficient information to do that). Yet, as noted, looking at the deviations and volatility could help indicate potential problems (while assuming that the VAT gaps are rather stable due to their nature). We employed such

COMMENT	RESPONSE
in which the VAT compliance gap was heading. According to an evaluation of the 2019 'fast estimates' (conducted in the 2020 edition of the study), the direction of the year-over-year change matched the full results for 22 out of EU28 MS, with a mean prediction error of 1.05 percentage points", and "One can see that the relative stability of the parameters, which was observed for many years, dropped for 2020 and 2021. This is especially true for the weighted average rate, which remained almost the same from 2016 up until 2019, only to drop by 6 pp. in 2020. It is difficult to predict its trajectory without detailed data on the structure of rates and consumption. Although data on household consumption and revenue is readily available via Eurostat, even these figures come with a certain degree of uncertainty." (Inception Report 2023, p.17). These results suggest that considerable caution is warranted in interpreting VAT gap estimates (not just 'fast estimates') for 2020 and 2021, and is likely to persist for 2022 versions when these are produced. The authors of the Inception Report are clearly aware of the need for such caution. <u>However, I would encourage them to consider whether a greater level of quantification could be added to the overall uncertainty surrounding the estimated gaps by country</u>. For example, a change in the estimated VAT gap for country X from say, 5.1 in year t to 5.7 in year t+1, would carry greater confidence that this change is 'real' and not merely a result of statistical error if the VAT estimates are associated with a standard deviation of, say, 0.1, compared to if the standard deviation is 0.5. In the former case (s.d. = 0.1), an interpretation that the 'trend is upward' is much more reliable than it would be in the latter case (s.d. = 0.5). With VAT gaps estimate available for most countries at the industry level over 2016 to 2021, one option would be to consider whether there is sufficient data to enable some form of confidence interval to be obtained for VAT gap estimates by country. This seems to be particularly important for the 2023 estimates (for 2022) because of the greater levels of volatility in estimates in 2020 and 2021. Clearly this would be a mammoth task to add to the already considerable effort required to produce the	an approach through our road-sign signalling component. This year, we will also complement our work with case studies (which we describe in the revised inception report). This could allow for additional considerations regarding the accuracy of estimates for selected MS.

COMMENT	RESPONSE
proposed 2023 estimates. Instead, perhaps the study team could consider whether some statistical evaluation, such as via confidence intervals, could be produced for a subset of results in order to establish how substantive this issue is potentially for interpretation of observed trends in estimated gaps. Perhaps a 'micro' study of a few selected EU countries with better quality data could be attempted?	
Capturing Behavioural Responses As the Inception Report notes (p.11): "The VAT compliance gap is the difference between the tax revenue that would have been collected in the case of full compliance (assuming an unchanged tax base)" [emphasis added]. As a result, any estimated reduction/increase in the VAT gap, whether due to policy action or changes in compliance success, ignores the possibility that taxpayers may respond to those changes by altering their declared tax base – either legally or illegally. For example, greater compliance enforcement success which reduces the compliance gap may induce taxpayers to seek greater use of tax exemptions, thus increasing the policy gap. Or, reduced compliance gaps with the implied increase in some taxpayers effective VAT rate may induce those taxpayers to shift their economic activity overseas or otherwise out-of-scope, hence losing some total VAT revenue, despite the percentage of revenue captured increasing via compliance activity. In line with almost all other VAT gap studies, the Inception Report proposes to maintain the current practice of excluding possible tax base shifting. I am supportive of this approach, given that the current exercise is already fairly complex, and the difficulties of identifying the extent of any tax base effects, especially when these might be expected to differ in hard-to-quantify ways across EU countries and economic activities or industries. However I would encourage the study team to consider where specific cases of tax base effects seem most likely, and include some discussion of these where appropriate in order to facilitate interpretation of the	Thank you very much for this reassurance.

COMMENT	RESPONSE
estimates obtained. For example, countries and industries where very large VAT gaps are estimated or where large year-to-year reductions are observed might be expected to be associated with larger behavioural responses that reduce the tax	

Review of the inception report by Thiess Büttner

COMMENT	RESPONSE
Prof. Dr. Thiess Büttner Chair of Public Finance School of Business, Economics and Society	
Section 1a follows the 2022 report very closely. Figures 1 and 2 are adopted from the 2022 report. The left panel of Figure 1 makes clear that VAT revenue is a subset of VTTL which is a subset of "notional ideal revenue". But my understanding is that the area covered by the gaps in the right panel should correspond to the differences between the concepts in the left hand panel. It is not clear, whether this is the case, and I suggest to redo the figure in order to make this conceptual feature clearly visible.	Thank you for this comment. We improved this visual feature.
On page 12, the numbers for the equations have slipped. More importantly, the different implicit definitions for the policy gap in equations (8), (8) and (9) seem incorrect. While the right-hand side results in absolute terms, the left-hand side includes a 1- term, which makes no sense to me. In fact, in EC/CASE (2015), p.53, the right-hand side expressions are divided by some measure of notional revenues obtained if the standard rate is applied on all consumption. The relationship between the VAT policy gap and the exemption and rate gaps is not clear as the decomposition differs from Keen (2013) and is not formally derived. Hence, it is not clear whether the entire policy gap is exactly split into exemption and rate gaps or whether there is a residual category. In EC/CASE (2015) this is not the case. As it seems that the report uses the same methodology, why not stating this fact clearly? Conversely, if there were a residual category, this would also be important.	This was an informed decision to present a simplistic notation in the equations describing the policy gaps. In fact, that this simplification made some elements (including additive character of the gap) unclear. We amended the notation and the description. The current version should also be clearer in explaining that there is no residual effect (the gaps are fully additive thanks to the different treatment of non-deductible VAT).

COMMENT	RESPONSE
Figure 2 is not helpful. First, it fails to report the policy gap. Second, figure 2 contradicts figure 1, where VTTL is full subset of notional ideal revenue in the left panel. The left-hand side panel of fig-ure 2 signals that there is no perfect overlap. This makes no sense to me. If there is a measurement problem, it should also be taken into account in figure 1, and would definitely need discussion. If, instead, the concept is changed between figure 1 and figure 2, I would suggest to redraft the methodology and use the same concept everywhere.	The graph intended to indicate that part of the VTTL is outside the notional ideal revenue. It shows both the exemption and the rate, two additive components of the policy gap. Marking the policy gap could make the graph less clear, in our view. The overlapping is caused not by the measurement problem but by non-deductible input VAT. We extended the discussion to make takeaways from the graph more clear.
The right-hand side panel of figure 2 is associated with a discussion indicating that there are components of the exemption gap that are “unlikely to be taxed in an ideal world.” With this explanation the report seems to overturn the very concept of “notional ideal revenues” that was specifically developed in the beginning of the section. I find this confusing and it is not the standard in the economic literature depends on arbitrary judgements that should be avoided.	The text reads “notional values that are unlikely to be taxed even in an ideal world”. This is intended to indicate for policy makers how difficult it is to reduce the policy gap to zero rather than to overturn the notional benchmark for VAT systems. We are of the opinion that elements of household final consumption like own-consumption or imputed rents are very difficult to be taxed in real life.

COMMENT	RESPONSE
I think the way the methodology is described is below the standard set by earlier reports. Given the significance of the report on the VAT gap in the EU, I think that the methodology should be fully documented so that all terms used in the report are clearly determined using precise and ac-accessible formulas within a consistent framework. This is currently not the case.	The main formula of the VTTL model is (5). Although there are numerous MS-specific adjustments, they are documented outside the report (and shared with MS' administrations) as this would be very lengthy even for an annex. The Final Report will contined extended and improved documentation (not only compared to the Inception Report but also to earlier Final Reports).
A fundamental problem in measuring the VAT gap is how to deal with the informal economy. In addition to undeclared work, which by its nature is subject to systematic reporting issues, the threshold for tax liability is of particular importance. The report notes that the effect of the VAT threshold is taken into account as an additive component. More information would be helpful. Intuitively, I would expect a higher threshold, and consequently a larger informal sector, to reduce the value of VTTL ceteris paribus and, hence, to increase the VAT policy gap. However, just reading the report this is not clear. It also not clear whether the effect of the threshold is part of the ex-emption gap.	Thank you for this comment. We made clear that the VAT registration thresholds are a part of the exemption gap. In fact, the thresholds may impact VAT revenue in various forms (artificial business separation, under-declaration, and bunching below thresholds). Yet, this impact is expected to be small as turnover of companies below the threshold is on average not much above 1% of all companies' turnover.
On page 14, there is talk of Task 5 and Task 6. What exactly these tasks are is not clear.	Annex with tasks was added.
Table 2 is somewhat restrictive regarding the possible survey strategies. For example, there would also be the possibility to work with online queries.	We did not include such a possibility as the main objective is to gather very large data sets with formats varying across countries. The EU survey system would not allow for this.
In my opinion, the main risks to the project outlined in section two are relevant and reasonable. However, in my view, the current difficulties with regard to the considerable cyclical fluctuations are a problem mainly for the "fast estimates". Since, unlike the basic VAT gap estimates itself, these estimates are based on annual changes. Therefore,	We keep in mind and agree with the reviewer that the fast estimates are less accurate and credible. At the same time, in our view, with the current calendar of data availability, there is no method that would

COMMENT	RESPONSE
there are strong swings in one direction or the other depending on the choice of the base year. However, it is not clear what the purpose of the "fast estimates" actually is. Values for the VAT gap can be determined perhaps more quickly, but there are considerable problems for the interpretation. It seems to me that only small amount of information is gained at the cost of raising doubts about the methodology.	allow to estimate accurately changes in the effective rate in t-1 (which would make the estimates for t-1 full rather than fast). The inclusion of fast estimates was an informed decision of the European Commission caused by the need to present as up-to-date figures as possible.
While it makes sense to argue that the strong increase of consumption in 2021 relative to 2020 has pushed some of the VAT gap estimates into negative territory, using 2019 instead of 2020 is only a quick fix that obscures the methodology. This is clear from the fact that the VAT gap esti-mate in some cases is negative independent of whether 2019 or 2020 is used as a reference year.	The main objective of this simulation is to pinpoint MS for which we could have problems related to negative fast estimates. In other words, this is to show the problems rather than justify them. In both simulation scenarios we use actual 2021 values of tax base but assume different effective rates (for 2020 and 2019). We do this as we do not have the calculation for 2021 yet.
Table 4 is flawed. For example, growth in DE is 2.6% and not 8.0%. Obviously, some things got mixed up here.	Corrected. The problem was caused by the wrong order of CY in the table.
In Section four, it is not clear whether the missing data relate to the status of the inception report or whether the data will improve as the project progresses.	Clarified.

Review of the draft final report by Thiess Büttner

COMMENT	RESPONSE
Prof. Dr. Thiess Büttner Chair of Public Finance School of Business, Economics and Society	
I would suggest to mention briefly in the introduction that the methodology has been revised because ORS data are no longer available. Further, the presentation of C-Efficiency could be better integrated: 1. It remains unclear whether "VR" in the numerator of equation (12) is identical with the quantity "VAT revenue" in equation (1) and whether it is also defined following ESA 2010. 2. With respect to the denominator of equation (12), the term statutory tax rate is used for "t", whereas equation (6) refers to the “VAT standard rate”. Are the two the same? 3. In the denominator of equation (12) C is used for consumption. It would be useful to have some hint here whether this should be understood as the sum of HHC+GOV+NPISH as used in equation (5).	Thank you for these comments. To address these problems, we added additional clarification to point that: 1. VR in equation (12) follows the ESA 2010 standard. 2. Standardized the notation of standard statutory rate in equation (6) and (12). 3. Final consumption in equation (12) includes three components (HHC, GOV and NPISH).
Section II presents some key points on macroeconomic developments in 2021, which is the focus of the later analysis, and highlights developments in tax rates. The discussion is appropriate and well done. I would only note here that in light of the projections for 2022, the development in VAT rates in the year 2022 is actually also relevant. The tax rates for this year could also be reported here or listed in the annex.	Thank you for these comments. Since the report covers 2022 to limited extent, we decided to focus the presentation of the background on 2020 and 2021.
Section III presents estimates of compliance gap trends through 2021. It is pleasing to see here that this gap has continued to decrease. It makes sense that the results are presented here first without going into detail about the driving forces. At this point, I would only want to suggest adding a short paragraph about the changed data basis. As Section I explains, the data basis was changed because of the missing ORS	To address this comment, similar to the comments made by the internal reviewers, we added a section dedicated to the decline of the compliance gap in 2022.

information. On page 21, it is emphasized that this data was only available until 2020, so from 2021 onwards, the procedure is different. The ques-tion now arises here whether or not the decrease in the gap may be partly due to the changed data basis.	
Section V focuses attention on the VAT policy gap. Here, too, I have only editorial comments. For example, Figure 18 shows values without decimal places, so that there are rounding differences to Table 5. Figure 18 could also report the numerical values for the VAT policy gap. When discussing Figure 20, the strong statements on changes contrast somewhat with the overall very stable impression	We concur with the comments. We implemented the changes to the reporting of decimal places suggested by the reviewer and amended the sentence, which might have overemphasized the magnitude of changes between 2021.
Section VI provides a short discussion of the revenue implications by decomposing the revenue change into the changes in the effective VAT rate, the compliance and the tax base. The decomposition is useful and interesting. The methodology is explained in the Annex A. Here, as above, I would like to make the editorial comment to harmonize the variable names with Section I. Moreover, it seems that there is a typo in the presentation of the decomposition: the decomposition of $\frac{\Delta VR}{VR}$ is not multiplicative but additive.	In response to the comment, we harmonized those elements that were assigned different notations. We also corrected the error in the formula noted by the reviewer.
I think the key statements on the VAT gap are very well done. Here are just a few comments. • It is not always clear how the preliminary results are assessed. E.g., in the case of Bel-gium, the increase in 2022 is noted as a decrease in volatility, but perhaps the increase is a reflection of volatility or a signal of a growing gap? The sharp decline in Greece remains uncommented, as does the stable figure for France, etc. • The selection of key economic indicators is somewhat unclear to me and may deserve some explanation. For example, why is the unemployment rate shown? Moreover, I am not sure what is reported as the "tax wedge". From the footnote 22 I take it that the authors have in mind the issue of the total tax wedge on labor income. This would make sense for me with respect to the incentive for undeclared work. But then social security would also have to be considered. If this is what is meant, however, the figures seem a bit low. For instance, according to the OECD's Taxing Wages Report, the tax burden for	Thank you for this comment. We complemented the report with additional comments. Still, some changes which are less surprising or not pointing to substantial changes in the gaps received less attention. The variables included in the macro highlight were clarified as well as the rationale behind this choice.

a single person with an average income in Belgium is over 50%, but the average figure provided here for 2020-2021 is only 40%.	
Section VIII includes an assessment of data availability and reliability. This is important firstly to be able to assess the quality of the statements and also to understand the ”traffic-light system” used in Section VII. The presentation also provides insights into the difficulties in determining the VAT gap. It becomes clear that the data provided by official statistics are not sufficient and that additional unpublished information has been used. However, it is not entirely clear to me what this is due to in detail. Is the data available in principle from Eurostat, or from the statistical offices of the member states, but not sufficiently up-to-date at the time of the study, or is certain information not part of the regular statistical reporting program? This distinction is important, since it should be possible for interested parties, e.g. academic research, to calculate the VAT gap themselves, if only for reasons of transparency.	We added additional clarification to point out that a large fraction a considerable portion of information comes from tax administration and third parties.
Finally, Section IX addresses issues related to the communication of study results. I find the presentation interesting and think it is right to examine alternative options in the sense of high-lighting best practice. As an economist, however, I am not in a position to give a well-founded opinion. I would only like to note that other instruments could also help to disseminate the results of the study. For example, the presentation at conferences. It might also be useful to make the underlying data publicly available to initiate secondary research.	Thank you for this information. The suggestion on the conferences is well noted. The final report, similarly to the last year’s report, will contain the links to the estimates.

Annex C. Statistical appendix

Table 70: VTTL (EUR million)

	2017	2018	2019	2020	2021	*2022*
BE	33 887	35 247	36 348	33 898	36 834	*40 695*
BG	5 323	5 781	6 336	6 076	7 018	*8 208*
CZ	16 926	18 703	19 705	18 236	19 440	*23 073*
DK	30 776	31 947	32 558	32 475	35 398	*37 604*
DE	249 693	259 883	268 349	234 602	266 845	*297 224*
EE	2 305	2 469	2 622	2 599	2 887	*3 341*
IE	14 107	14 886	16 636	15 770	16 708	
EL	20 663	20 549	20 229	16 351	18 173	*20 976*
ES	80 133	82 893	86 127	73 447	82 912	
FR	178 555	183 265	190 843	176 449	194 283	*209 773*
HR	6 886	7 398	7 399	6 710	8 108	*9 405*
IT	140 593	141 528	142 731	126 968	135 580	*152 551*
CY	2 128	2 233	2 347	2 164	2 378	
LV	2 548	2 756	2 881	2 790	3 079	*3 749*
LT	4 426	4 637	4 857	4 929	5 482	*6 523*
LU	3 561	3 896	3 901	3 941	4 414	
HU	13 682	14 418	15 539	14 460	15 938	*18 149*
MT	1 050	1 208	1 322	1 171	1 346	*1 578*
NL	53 024	56 740	62 468	61 407	65 254	*73 519*
AT	30 909	32 169	32 819	30 133	31 551	
PL	42 897	46 351	48 420	47 085	51 010	
PT	18 653	19 660	20 465	18 071	19 821	
RO	18 249	19 302	21 332	21 304	24 507	*29 672*
SI	3 620	3 934	4 191	3 754	4 386	
SK	7 125	7 557	8 079	7 925	8 236	*9 718*
FI	21 723	22 354	23 195	22 527	23 641	*25 580*
SE	45 811	44 734	45 046	45 625	51 151	*53 759*
UK	*183 644*	*188 440*	*190 221*			
EU28	**1 232 897**	**1 274 937**	**1 316 965**			
EU27	**1 049 254**	**1 086 498**	**1 126 744**	**1 030 868**	**1 136 381**	

Source: own calculations, download underlying data.

Table 71: Household VAT liability (EUR million)

	2017	2018	2019	2020	2021
BE	19 148	19 731	20 208	18 311	19 724
BG	3 986	4 222	4 540	4 276	4 993
CZ	10 661	11 457	11 855	10 550	11 272
DK	18 052	18 836	19 202	18 654	20 224
DE	149 768	153 562	157 753	130 630	147 177
EE	1 525	1 628	1 715	1 648	1 832
IE	7 278	7 314	8 388	7 141	7 700
EL	15 827	16 349	15 960	12 193	13 612
ES	58 709	60 170	61 266	48 848	55 503
FR	102 853	106 028	108 486	98 567	107 541
HR	5 079	5 353	5 411	4 704	5 896
IT	100 344	102 153	103 383	89 444	93 616
CY	1 231	1 298	1 341	1 100	1 264
LV	1 963	2 068	2 114	2 015	2 242
LT	3 664	3 846	3 995	3 915	4 415
LU	1 450	1 540	1 572	1 432	1 609
HU	9 528	9 541	10 145	8 963	9 909
MT	588	642	688	483	567
NL	27 205	28 468	31 621	29 717	32 158
AT	20 658	21 358	21 789	19 055	19 078
PL	30 211	32 277	33 968	32 651	35 564
PT	13 791	14 455	15 052	12 839	13 964
RO	11 495	12 397	13 127	12 447	14 209
SI	2 679	2 840	3 025	2 622	3 038
SK	5 437	5 732	6 033	5 971	6 123
FI	11 830	12 121	12 205	11 684	12 397
SE	23 327	22 877	22 815	22 655	25 395
UK	*122 972*	*126 962*	*128 333*		
EU28	**781 259**	**805 225**	**825 990**		
EU27	**658 288**	**678 263**	**697 657**	**612 515**	**671 021**

Source: own calculations, download underlying data.

Table 72: NPISH and government VAT liability (EUR million)

	2017	2018	2019	2020	2021
BE	1 401	1 472	1 532	1 555	1 688
BG	152	175	196	230	271
CZ	788	896	974	999	1 037
DK	714	711	733	756	814
DE	6 924	7 199	7 648	7 413	8 631
EE	68	76	86	91	100
IE	194	173	176	187	198
EL	734	674	695	809	806
ES	2 715	2 894	3 107	3 306	3 497
FR	1 737	1 777	1 835	1 895	2 047
HR	216	191	192	199	216
IT	1 689	1 597	1 605	1 605	1 677
CY	26	28	29	36	41
LV	66	69	84	89	113
LT	46	43	52	54	61
LU	43	90	38	82	88
HU	422	474	608	717	792
MT	53	58	64	75	82
NL	568	586	752	771	841
AT	958	1 486	1 533	1 556	1 697
PL	1 821	1 958	2 094	2 187	2 459
PT	535	550	598	601	620
RO	718	769	907	906	923
SI	83	97	99	107	119
SK	98	132	104	106	118
FI	489	520	565	566	599
SE	1 821	1 827	1 904	1 906	2 118
UK	*3 527*	*3 428*	*3 656*		
EU28	**28 604**	**29 949**	**31 866**		
EU27	**25 078**	**26 521**	**28 210**	**28 806**	**31 655**

Source: own calculations, download underlying data.

Table 73: Intermediate consumption VAT liability (EUR million)

	2017	2018	2019	2020	2021
BE	7 331	7 715	8 105	7 731	8 532
BG	645	731	781	741	849
CZ	3 206	3 504	3 712	3 610	3 867
DK	7 209	7 430	7 626	7 762	8 509
DE	49 274	52 101	54 118	52 241	59 726
EE	319	342	378	365	411
IE	4 492	5 076	5 671	6 026	6 290
EL	2 189	2 191	2 193	1 915	2 038
ES	10 204	10 629	11 362	11 192	11 843
FR	32 095	32 860	34 207	33 627	37 523
HR	991	1 015	1 019	850	997
IT	22 324	22 332	22 572	21 962	22 165
CY	441	486	522	549	589
LV	347	373	428	421	451
LT	439	456	499	531	617
LU	1 189	1 384	1 471	1 581	1 659
HU	1 882	2 039	2 181	2 178	2 426
MT	311	378	439	492	557
NL	14 220	15 857	17 056	17 504	17 968
AT	4 317	4 382	4 571	4 708	5 391
PL	6 384	6 691	6 885	6 752	7 344
PT	2 925	3 053	3 218	3 080	3 456
RO	1 837	2 050	2 231	2 484	2 615
SI	461	518	559	540	628
SK	908	949	1 149	1 130	1 271
FI	4 651	4 711	4 824	4 909	5 186
SE	10 815	10 625	10 857	11 202	12 568
UK	*38 441*	*38 807*	*38 806*		
EU28	**229 847**	**238 683**	**247 442**		
EU27	**191 406**	**199 876**	**208 636**	**206 083**	**225 474**

Source: own calculations, download underlying data.

Table 74: GFCF VAT liability (EUR million)

	2017	2018	2019	2020	2021
BE	5 319	5 653	5 769	5 683	6 277
BG	532	641	810	803	877
CZ	2 275	2 786	3 097	3 058	3 269
DK	4 025	4 225	4 228	4 470	4 896
DE	41 422	44 735	46 643	42 804	49 347
EE	381	420	440	491	538
IE	1 839	2 073	2 113	2 118	2 219
EL	1 605	1 047	1 059	1 159	1 425
ES	7 758	8 356	9 407	9 176	11 088
FR	36 803	37 305	40 328	36 510	41 208
HR	586	820	785	921	957
IT	14 625	13 696	15 098	13 948	17 813
CY	427	413	445	467	471
LV	217	293	306	311	316
LT	526	570	631	752	732
LU	580	565	462	567	612
HU	1 658	2 234	2 539	2 570	2 761
MT	71	102	114	106	116
NL	10 487	11 272	12 392	12 766	13 578
AT	3 437	3 416	3 524	3 611	3 853
PL	3 890	4 824	4 866	4 872	4 960
PT	1 031	1 187	1 230	1 283	1 474
RO	3 950	4 018	4 791	5 176	6 411
SI	329	402	428	430	531
SK	680	761	802	730	732
FI	3 987	4 300	4 819	4 663	4 717
SE	9 307	8 857	8 912	9 492	10 656
UK	*16 997*	*17 269*	*18 516*		
EU28	**174 745**	**182 241**	**194 554**		
EU27	**157 748**	**164 972**	**176 037**	**168 937**	**191 834**

Source: own calculations, download underlying data.

Table 75: Net adjustments (EUR million)

	2017	2018	2019	2020	2021
BE	688	676	733	619	613
BG	7	13	9	25	28
CZ	- 4	60	66	20	- 3
DK	777	745	768	833	955
DE	2 304	2 285	2 187	1 514	1 965
EE	12	3	4	4	5
IE	303	251	287	297	301
EL	308	289	323	277	292
ES	746	844	985	925	981
FR	5 067	5 296	5 987	5 850	5 964
HR	13	20	- 8	35	42
IT	1 611	1 751	73	8	309
CY	4	7	10	12	12
LV	- 45	- 47	- 50	- 46	- 42
LT	- 249	- 279	- 319	- 323	- 343
LU	300	317	358	280	446
HU	191	130	67	33	51
MT	27	28	17	15	24
NL	545	556	647	648	709
AT	1 539	1 528	1 403	1 203	1 532
PL	591	601	607	623	684
PT	372	415	366	269	308
RO	250	68	275	291	348
SI	68	77	79	54	69
SK	2	- 17	- 8	- 14	- 7
FI	768	703	782	705	741
SE	541	547	558	370	414
UK	*1 707*	*1 974*	*909*		
EU28	**18 441**	**18 840**	**17 113**		
EU27	**16 735**	**16 866**	**16 204**	**14 527**	**16 398**

Source: own calculations, download underlying data.

Table 76: VAT revenues (EUR million)

	2017	2018	2019	2020	2021	*2022*
BE	29 763	31 053	31 702	29 282	34 304	*35 986*
BG	4 873	5 128	5 655	5 635	6 671	*7 748*
CZ	14 703	16 075	16 931	16 022	18 078	*21 855*
DK	28 049	29 199	29 892	31 073	33 618	*35 398*
DE	226 582	235 130	244 111	221 562	259 385	*287 508*
EE	2 149	2 331	2 483	2 469	2 847	*3 309*
IE	13 060	14 149	15 271	13 765	15 592	
EL	14 642	15 288	15 390	12 925	14 942	*18 839*
ES	73 970	77 536	79 301	69 435	82 250	
FR	162 011	167 720	173 953	161 537	184 731	*199 669*
HR	6 404	6 841	7 305	6 322	7 647	*8 887*
IT	107 576	109 333	111 464	99 669	120 980	*138 537*
CY	1 720	1 955	2 066	1 786	2 182	
LV	2 164	2 449	2 632	2 541	2 854	*3 599*
LT	3 310	3 522	3 856	4 009	4 688	*5 644*
LU	3 382	3 534	3 685	3 741	4 344	
HU	11 729	12 950	13 916	13 429	15 230	*17 100*
MT	810	920	934	849	1 001	*1 190*
NL	49 833	52 712	58 115	58 971	65 400	*69 928*
AT	28 304	29 323	30 405	28 136	30 668	
PL	36 339	40 423	42 383	41 856	49 317	
PT	16 810	17 868	18 786	16 804	19 108	
RO	11 650	12 890	13 795	13 368	15 511	*19 238*
SI	3 481	3 765	3 962	3 553	4 299	
SK	5 919	6 319	6 830	6 820	7 366	*8 603*
FI	20 404	21 364	21 974	22 005	23 551	*25 061*
SE	44 098	43 403	43 412	43 981	49 215	*51 959*
UK	*162 724*	*168 703*	*176 317*			
EU28	**1 086 459**	**1 131 882**	**1 176 528**			
EU27	**923 735**	**963 180**	**1 000 210**	**931 545**	**1 075 778**	

Source: Eurostat, download underlying data.

Table 77: VAT compliance gap (EUR million)

	2017	2018	2019	2020	2021	*2022*
BE	4 124	4 194	4 646	4 616	2 530	*4 709*
BG	450	653	681	442	347	*460*
CZ	2 223	2 628	2 774	2 214	1 362	*1 218*
DK	2 728	2 748	2 665	1 402	1 780	*2 206*
DE	23 111	24 753	24 238	13 040	7 460	*9 716*
EE	156	138	140	129	40	*33*
IE	1 047	737	1 365	2 004	1 116	
EL	6 021	5 261	4 839	3 426	3 231	*2 137*
ES	6 163	5 357	6 826	4 012	662	
FR	16 544	15 545	16 890	14 912	9 552	*10 104*
HR	482	557	94	388	461	*518*
IT	33 017	32 195	31 267	27 299	14 600	*14 014*
CY	408	278	281	378	197	
LV	384	307	249	250	225	*149*
LT	1 116	1 115	1 001	920	795	*879*
LU	180	363	215	200	70	
HU	1 953	1 468	1 623	1 031	709	*1 049*
MT	240	288	388	322	345	*388*
NL	3 191	4 028	4 353	2 436	- 146	*3 591*
AT	2 605	2 846	2 413	1 997	883	
PL	6 558	5 927	6 037	5 229	1 694	
PT	1 844	1 792	1 679	1 267	713	
RO	6 599	6 412	7 537	7 936	8 996	*10 435*
SI	138	169	228	201	87	
SK	1 206	1 237	1 249	1 104	871	*1 116*
FI	1 319	990	1 221	522	90	*519*
SE	1 713	1 331	1 633	1 644	1 935	*1 800*
UK	20 920	19 737	13 904			
EU28	**146 439**	**143 055**	**140 438**			
EU27	**125 519**	**123 318**	**126 534**	**99 323**	**60 603**	

Source: own calculations, download underlying data.

Table 78: VAT compliance gap (percent of VTTL)

	Backcasted series																	Full estimates					Forecast
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Belgium	6.8%	11.4%	9.1%	12.3%	10.8%	10.5%	10.8%	9.0%	12.8%	13.4%	11.7%	13.1%	14.9%	13.1%	9.6%	12.6%	10.9%	12.2%	11.9%	12.8%	13.6%	6.9%	11.6%
Bulgaria	35.8%	38.3%	46.4%	35.3%	26.1%	22.0%	19.1%	24.5%	16.5%	27.3%	24.3%	26.1%	21.8%	16.7%	22.5%	19.9%	12.7%	8.4%	11.3%	10.7%	7.3%	4.9%	5.6%
Czechia	24.5%	23.7%	24.1%	26.3%	7.0%	5.0%	10.6%	14.5%	18.3%	19.8%	22.7%	18.2%	21.3%	20.2%	17.7%	18.4%	16.0%	13.1%	14.1%	14.1%	12.1%	7.0%	5.3%
Denmark	13.1%	12.7%	12.1%	11.5%	11.6%	10.9%	10.9%	10.6%	12.7%	11.1%	11.5%	11.9%	11.8%	12.7%	11.3%	10.9%	9.2%	8.9%	8.6%	8.2%	4.3%	5.0%	5.9%
Germany	10.4%	12.8%	12.3%	12.1%	12.3%	12.2%	10.9%	12.6%	11.7%	9.0%	9.2%	10.5%	11.7%	11.9%	11.8%	9.2%	9.4%	9.3%	9.5%	9.0%	5.6%	2.8%	3.3%
Estonia	10.6%	14.2%	14.9%	15.8%	21.7%	12.1%	8.6%	7.4%	17.4%	11.0%	12.2%	14.1%	14.2%	15.8%	12.1%	7.4%	7.2%	6.8%	5.6%	5.3%	5.0%	1.4%	1.0%
Ireland	8.5%	0.5%	3.0%	4.9%	2.0%	6.2%	6.2%	7.7%	9.7%	14.0%	10.9%	10.2%	10.2%	5.3%	1.7%	7.3%	4.8%	7.4%	5.0%	8.2%	12.7%	6.7%	-
Greece	15.8%	13.0%	13.9%	18.4%	19.0%	21.9%	22.8%	22.5%	20.3%	26.1%	22.7%	30.2%	24.9%	28.4%	22.0%	25.9%	24.9%	29.1%	25.6%	23.9%	21.0%	17.8%	10.2%
Spain	6.5%	8.3%	9.7%	6.8%	5.1%	0.7%	1.4%	9.9%	22.0%	34.6%	11.9%	16.3%	12.6%	14.5%	11.1%	7.2%	7.2%	7.7%	6.5%	7.9%	5.5%	0.8%	-
France	4.3%	6.2%	7.8%	8.3%	7.1%	7.0%	7.5%	7.5%	9.3%	13.5%	8.7%	7.4%	11.7%	10.0%	10.3%	9.4%	8.8%	9.3%	8.5%	8.9%	8.5%	4.9%	4.8%
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.0%	8.5%	7.0%	7.5%	1.3%	5.8%	5.7%	5.5%
Italy	25.3%	27.3%	26.6%	30.7%	31.1%	30.1%	26.4%	26.1%	29.0%	34.1%	26.5%	29.6%	28.8%	30.2%	28.8%	27.0%	26.7%	23.5%	22.7%	21.9%	21.5%	10.8%	9.2%
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.3%	19.2%	12.4%	12.0%	17.5%	8.3%	-
Latvia	12.6%	17.4%	18.4%	18.4%	19.6%	11.8%	8.1%	7.5%	22.4%	38.8%	31.0%	32.9%	24.5%	24.9%	21.4%	21.0%	13.7%	15.1%	11.1%	8.6%	9.0%	7.3%	4.0%
Lithuania	25.4%	28.6%	27.7%	33.1%	37.3%	31.1%	27.8%	23.6%	23.9%	34.9%	29.6%	29.8%	31.0%	31.0%	30.2%	26.9%	26.1%	25.2%	24.0%	20.6%	18.7%	14.5%	13.5%
Luxembourg	16.2%	15.9%	14.1%	13.9%	11.6%	10.0%	9.7%	11.9%	13.7%	9.9%	10.0%	10.3%	9.8%	11.0%	11.3%	10.3%	11.3%	5.0%	9.3%	5.5%	5.1%	1.6%	-
Hungary	17.6%	23.5%	25.5%	21.6%	19.1%	22.7%	23.0%	20.1%	22.2%	22.0%	22.3%	22.0%	22.2%	21.6%	19.1%	16.5%	14.2%	14.3%	10.2%	10.4%	7.1%	4.4%	5.8%
Malta	33.1%	33.8%	32.1%	31.8%	36.5%	25.7%	26.5%	29.4%	28.5%	26.8%	30.9%	31.9%	33.3%	32.4%	33.5%	24.1%	25.0%	22.8%	23.8%	29.3%	27.5%	25.7%	24.6%
Netherlands	12.8%	11.9%	10.7%	10.1%	7.4%	6.9%	6.4%	4.2%	7.7%	12.8%	5.4%	9.9%	9.3%	10.0%	9.0%	10.1%	5.3%	6.0%	7.1%	7.0%	4.0%	-0.2%	4.9%
Austria	7.7%	9.4%	6.5%	9.8%	10.2%	10.3%	12.6%	11.5%	11.5%	7.8%	9.9%	11.7%	8.9%	10.3%	9.2%	8.7%	8.3%	8.4%	8.8%	7.4%	6.6%	2.8%	-
Poland	24.9%	29.0%	26.4%	25.6%	25.0%	17.3%	13.3%	10.0%	16.7%	22.8%	20.1%	20.3%	26.6%	26.2%	24.0%	24.2%	19.9%	15.3%	12.8%	12.5%	11.1%	3.3%	-
Portugal	-0.7%	1.1%	1.8%	1.8%	2.6%	-0.9%	1.5%	3.0%	4.3%	15.3%	12.9%	13.2%	15.4%	15.7%	13.7%	12.7%	11.9%	9.9%	9.1%	8.2%	7.0%	3.6%	-
Romania	36.8%	44.2%	34.7%	34.6%	40.1%	29.7%	32.5%	31.3%	32.5%	44.5%	39.8%	35.7%	37.0%	37.3%	39.7%	34.0%	36.4%	36.2%	33.2%	35.3%	37.3%	36.7%	35.2%
Slovenia	3.4%	5.3%	4.8%	5.7%	5.6%	5.2%	4.8%	6.6%	8.8%	10.7%	8.6%	6.3%	9.3%	5.7%	9.6%	7.8%	5.4%	3.8%	4.3%	5.4%	5.4%	2.0%	-
Slovakia	20.8%	20.7%	22.0%	14.5%	17.4%	14.0%	20.7%	24.6%	23.5%	29.9%	31.3%	25.5%	35.0%	29.7%	27.9%	25.0%	20.0%	16.9%	16.4%	15.5%	13.9%	10.6%	11.5%
Finland	7.2%	8.4%	7.9%	8.0%	8.7%	6.6%	7.0%	9.6%	10.3%	5.2%	8.9%	5.6%	5.4%	5.9%	6.1%	5.5%	4.8%	6.1%	4.4%	5.3%	2.3%	0.4%	2.0%
Sweden	8.3%	8.5%	8.2%	7.4%	7.1%	6.7%	7.7%	6.5%	5.4%	4.6%	4.3%	5.0%	7.9%	4.6%	4.4%	4.1%	2.8%	3.7%	3.0%	3.6%	3.6%	3.8%	3.3%
United Kingdom	*12.7%*	*13.6%*	*13.1%*	*10.2%*	*11.4%*	*11.6%*	*13.0%*	*13.1%*	*15.0%*	*13.9%*	*12.2%*	*10.9%*	*11.9%*	*10.8%*	*10.9%*	*9.9%*	*10.7%*	*11.4%*	*10.5%*	*7.3%*	-	-	-
EU27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11.9%**	**11.2%**	**10.7%**	**9.6%**	**5.3%**	-

Source: own calculations, download underlying data.

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