VAT GAP
IN THE EU

2024 REPORT

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Oxford Economics
Economisti Associati
Syntesia

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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. It serves as one of the core revenue sources for the general government of EU Member States. In 2023, the VAT revenue-to-GDP ratio amounted to 7.2% of the EU GDP and 15.7% of total government revenue. This makes VAT essential for financing the provision of public goods and services and for ensuring the financial stability of governments. VAT is also significant for the EU budget, as its base is used to calculate a portion of the EU's own resources. Naturally, VAT rules shape Member States' economies and play a crucial role in the EU Single Market.

In one of the possible formulations, VAT revenue can be viewed as the product of three elements: 1) the tax base; 2) the statutory standard rate; and 3) collection efficiency. The importance of the latter component, VAT collection efficiency, should not be underestimated. As demonstrated by earlier studies on the *VAT gap in the EU*, it substantially differentiates EU economies and tends to change over time in response to government policies and other factors.

VAT collection efficiency depends on two crucial factors: taxpayer compliance, and concessions granted through exemptions, reduced rates and other measures. The VAT compliance gap, associated with the former, represents the difference between the revenue that would be collected if all taxpayers were compliant and the actual revenue. This difference encompasses a wide range of sources of forgone receipts, from the legal exploitation of loopholes in tax systems, to evasion and organized large-scale tax fraud. Non-compliance can also be unintentional, resulting from administrative errors, omissions, non-fraudulent bankruptcies, and other factors (EC/CASE, 2023). Another important source of forgone VAT revenue is policy decisions that narrow the tax base or reduce VAT liability for certain parts of the tax base, often referred to as VAT expenditures. These choices, reflected in the EU VAT Directive or national legislation, are typically implemented to provide certain incentives for taxpayers at the cost of VAT revenue. They may also be made due to difficulties in imposing payments on certain taxpayers or on specific types of goods and services.

Since 2009, with the publication of the first study to quantify and analyse *the VAT Gap in the EU-25*, the European Commission has provided a foundation for monitoring VAT collection efficiency in the EU. This report continues those efforts, building on the findings and insights of the previous studies. It is the 12th consecutive European Commission publication presenting VAT gap estimates and follows the seminal study of EC/Reckon (2009), as well as the subsequent EC/CASE (2013) report, which established the methodological approach to the tax gap calculations presented in this report. This edition also incorporates methodological improvements and innovations introduced by the study teams working on previous VAT gap reports. It also benefits from consultations with Member State authorities and the validation of estimates against results available from national administrations.

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 2018–2022. 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 17 Member States for which the available data allowed to proxy the change in effective rates. In addition, the report presents the estimates from the 10 preceding editions of the study rescaled to account for the corrections and improvements in the full calculations covering the 2018–2022 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. A new element introduced in this study is the more granular

breakdown of policy gap components. More specifically, the VAT rate gap has been broken down into six components: (1) agricultural products, foodstuffs, and beverages; (2) pharmaceuticals; (3) transport services; (4) accommodation and restaurant services; (5) utilities; and (6) other. The non-actionable VAT policy gap was further decomposed to attribute the theoretical revenue impact to the existence of public healthcare and administration. As another new element, we estimate the "actionable standard VAT rate" – the rate that would equalize the current VTTL in a counterfactual scenario where the exemptions and reduced rates contributing to the actionable VAT policy gaps are repealed. We also present estimates of the overall collection efficiency (the *C-efficiency* ratio) and investigate changes in yearly VAT revenue due to the basic components, which are the tax base, tax rates, and taxpayer compliance.

The calculation of VAT compliance and policy gaps uses a methodology well established by earlier VAT gap studies – *the top-down consumption-side* approach. Under this approach, the VAT Total Tax Liability (VTTL) is expressed as the sum of the liability from final use and non-deductible VAT accrued in value-added chains due to the inability of some VAT payers to deduct VAT. The equation behind the VTTL is the sum of products of tax base components and parameters. The information on the tax base comes predominantly from Eurostat's supply and use tables. As the availability and granularity of national accounts data vary across Member States, operationalizing the calculations requires a complex exercise to integrate disparate datasets to derive the most accurate approximation of tax base value and structure for all years covered by the study. To estimate the VTTL, around 10,000 parameters – mostly effective rates and non-deductibility ratios – are calculated for each year. The information for calculating these elements of the equation is provided by national administrations, which share relevant data from tax returns and other sources.

On top of presenting the VAT gaps, this report also investigates the sources of these gaps. The report includes three case studies devoted to important problem areas and patterns observed in selected Member States. In the first case study, the analysis addresses the interlinkages between the COVID-19 pandemic and the development of the VAT compliance gap. Two aspects were scrutinised here: (1) the difference in the impact of the COVID-19 pandemic on the VAT compliance gap between the Member States with the largest contribution of tourism and hospitality sectors and other Member States; and (2) the impact of a significant decrease in the VAT burden in Germany on taxpayer compliance. In the second case study, the study team looks at four Central and Eastern European Member States (Hungary, Latvia, Poland, and Slovakia) that, by implementing similar measures, were able to narrow their compliance gaps significantly in relatively short time frames. In the third case study, the report uses statistical and econometric tools to verify whether the prevalences of digital payments and the share of e-commerce contribute to the variation in the VAT compliance gap in time and across Member States.

The report consists of seven chapters. The first two discuss the economic and policy background, which are important drivers of the gaps presented in the subsequent chapters. VAT compliance gaps and analysis of the sources of their evolution are discussed in the third chapter. In the fourth chapter we analyse the VAT policy gap, the role of its components, and the C-efficiency. The fifth chapter presents the detailed results of the VAT compliance and policy gap estimates, and outlines trends for individual countries coupled with analytical insights. The sixth chapter brings together the findings presented in the preceding three chapters and provides a decomposition of the VAT revenue components. The last chapter describes the methodological approach.

The report is accompanied by six annexes. Annex A complements the last chapter by presenting the detailed methodological considerations underlying all components of the analysis. Annex B discusses data availability and reliability. Annex C presents detailed findings of the review, assessment and refinement of the methodological approach. Annex D contains external reviews of the inception and interim reports by two external reviewers. Annex E provides the statistical data, and Annex F contains graphs presenting the key macroeconomic drivers of economic growth across the EU27.

I. Economic context

This section of the report examines the economic environment influencing VAT revenue and its components. It focuses on 2022, which is the most recent year for which full estimates of the VAT compliance gaps for the EU Member States are available. Within the report, where possible, we have also included the fast estimates for 2023.

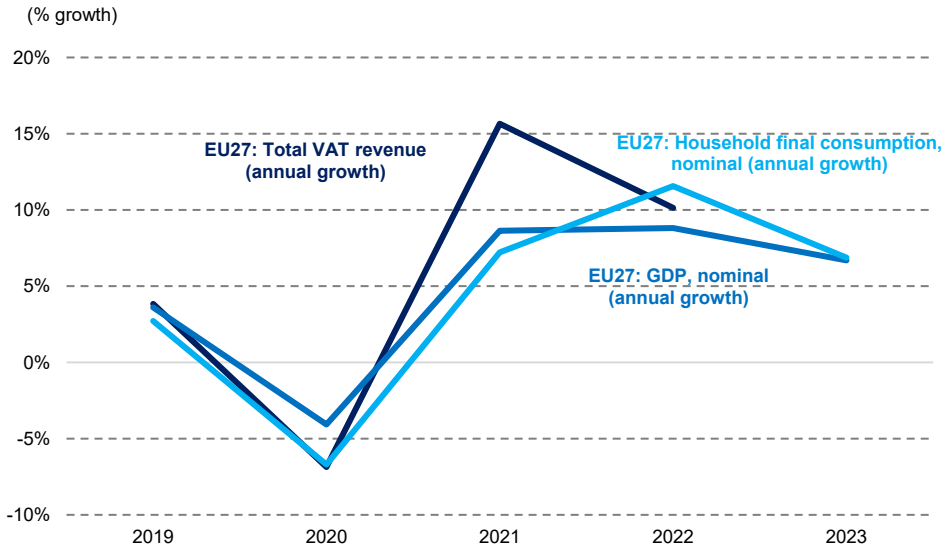
This section of the report is divided into two parts. The first focuses on developments in key macroeconomic indicators that impact VAT revenue growth. The second discusses the evolution in 2022 of a set of macroeconomic indicators that may affect VAT compliance according to the literature.[1]

I.a. Developments impacting VAT revenue

VAT revenue performance

The COVID-19 pandemic led to a significant decline in VAT revenue in 2020, primarily due to reduced household final consumption. However, with GDP and household final consumption returning to growth as restrictions were lifted, a marked recovery has been observed since 2021. In 2022, **VAT revenue rose by a further 10.1%**, with revenue 18.6% higher in level terms than compared to the 2019 pre-pandemic level (Figure 1).

Figure 1: Growth in VAT revenue, GDP, and household final consumption (EU27, % growth, 2019–2023)



Source: own elaboration based on EC/CASE (2023) and Eurostat (nama_10_gdp).

Global and regional backdrop

In 2022, the global economy was still rebounding from the impact of the COVID-19 pandemic. Consequently, **growth rates for 2021 and 2022 should be interpreted with caution** and seen in the context of the steep declines recorded in 2020. Additionally, 2022 comparisons to 2021 growth should

[1] *De Castro et al. (2016).*

be interpreted in the context of 2021 being the first and strongest year of the post-pandemic recovery period.

In 2022, **the global economy recorded moderate nominal GDP growth of 3.8%**, acting as a proxy for the performance of the global tax base. While still strong, this represented a significant slowdown from the robust 13.8% growth observed in 2021.

EU27

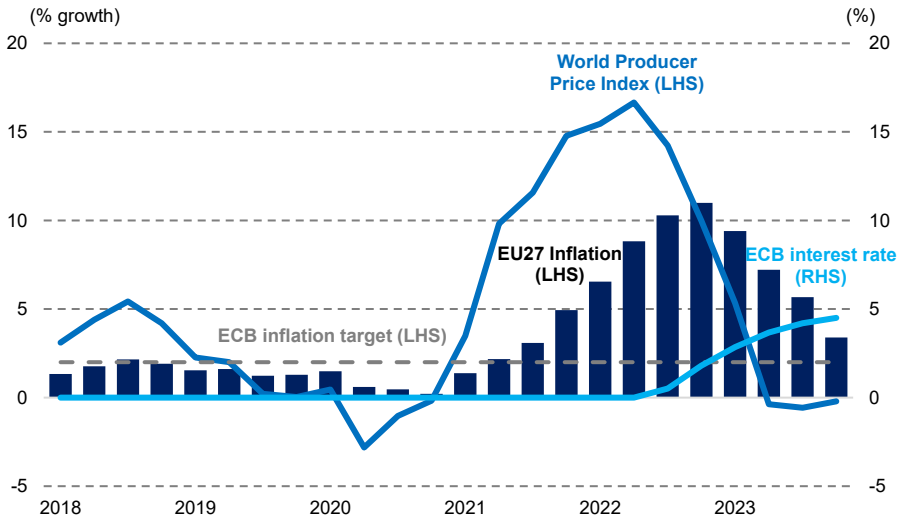
In a continuation of the post-pandemic economic recovery, almost all EU Member States recorded growth in real GDP in 2022. The only exception was Estonia, where real estate activities, the energy sector, trade, agriculture and financial activities weighed on real GDP. Overall, real GDP growth in the EU was recorded at 3.5%, following a 5.9% expansion in 2021. The robust performance was driven by the ongoing recovery from the pandemic, aided by a successful vaccination campaign and the lifting of restrictions. By 2022, real GDP was 3.3% above pre-pandemic levels for the EU27 aggregate, but still behind that of the US. However, there was significant variation in economic growth across Member States in 2022, with disparities in recovery rates largely influenced by the varying severity of the pandemic's impact and the differing economic structures of Member States and their exposure to Russian oil and gas imports. Meanwhile, in nominal terms, GDP growth in the EU27 was 8.8% in 2022, up marginally from 8.6% in 2021, with a larger portion of the growth in 2022 explained by rising inflation. The strong growth in real and nominal GDP contributed to the strong performance of the VAT base in the same year.

Despite robust growth in 2022 overall, **the pace of growth varied throughout the year** with strong growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year as inflation rose dramatically due to Russia's war of aggression against Ukraine. However, the full impact of the war, with higher inflation and a resultant rise in interest rates, was not fully seen in 2022, but in 2023 when real GDP growth slowed markedly to 0.5%.

In 2022, inflationary pressures escalated significantly in the EU27, with the inflation rate averaging 9.2%, the highest level ever recorded and up from 2.9% in 2021 (Figure 2).This surge was driven by a combination of factors, but primarily due to the **sharp rise in energy prices caused by Russia's war of aggression against Ukraine**, which disrupted energy supplies – particularly natural gas and oil – due to Russia being a major supplier to the EU27. A rise in energy prices contributes to an increase in the effective VAT rates as energy products are taxed at higher than average rates. **The war also affected the prices of various commodities,** especially agricultural products such as wheat, of which Russia and Ukraine are major exporters. However, in contrast to energy products, this price increase contributed to a drop in the effective VAT rates in the EU27, as agricultural products and food are usually taxed at reduced rates. Other factors influencing the effective rate in 2022 included the change in the composition of the consumer basket and the extent of government support. Rising inflation also impacted businesses, with the number of companies crossing the VAT threshold increasing, which impacted the average VAT burden and the VTTL estimates.

The severity of inflationary pressures varied across Member States, based on countries' reliance on Russian energy and the level of government intervention in place to contain the cost-of-living crisis for consumers and businesses.

Figure 2: The consumer price index, global producer price index and the European Central Bank interest rate (EU27, % growth/%, 2018–2023)

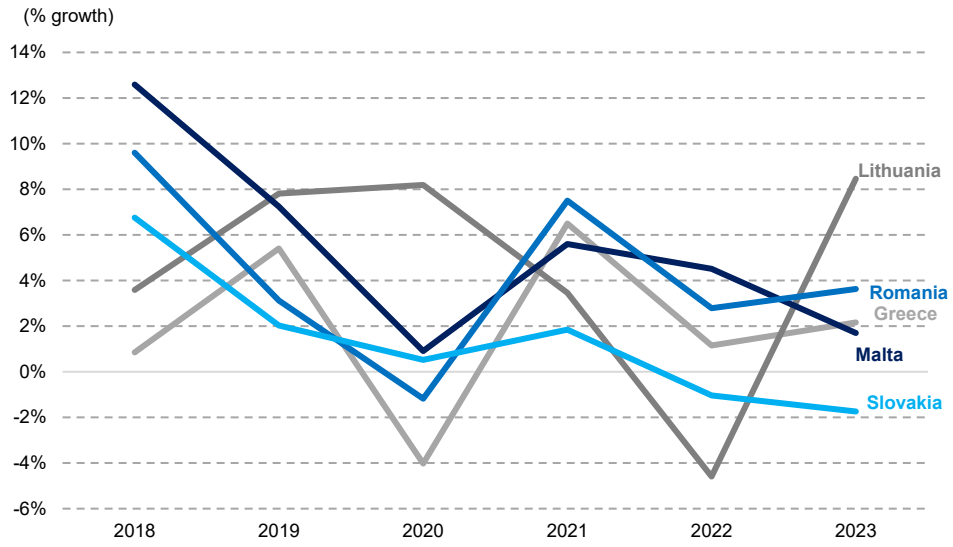


Source: own elaboration based on Eurostat (prc_hicp_aind) and Oxford Economics.

In response to rising inflation and the cost-of-living crisis, **EU governments implemented various policies to support businesses and consumers in 2022.** On the consumer side, governments and retailers engaged in efforts to control food costs, in some cases marking a return to price controls not seen since the 1970s. Greece, for example, capped retail profit margins on food and other essentials, Spain reduced the VAT rate on food – which had a direct downward impact on VAT revenue – and France negotiated agreements with supermarkets to offer certain food items at the lowest possible price. For businesses, many EU countries introduced energy subsidies and price caps to alleviate rising energy costs. Member States also provided tax relief and deferred tax payments to improve cash flow and reduce financial pressures, including VAT cuts on essential goods and services. The reduction of VAT rates and the introduction of exemptions for essential goods and services partially alleviated the burden on consumers and businesses, encouraging taxpayer compliance. However, this approach also directly resulted in a decline in VAT revenue. Direct financial support was also offered through grants, loans, and guarantees to support businesses despite the challenging economic environment. Additionally, sectors such as agriculture, hospitality, and transport received targeted assistance due to their vulnerability to the cost-of-living crisis. Targeted support in the form of subsidies and direct financial assistance helped businesses avoid passing on rising costs to consumers, which would have otherwise driven down consumption and VAT revenue. These interventions came against the backdrop of EU governments unwinding COVID-19 support measures, including wage subsidies and grants, and emergency labour market measures such as furlough schemes.

In 2022, **higher inflation eroded the purchasing power of households' disposable income** across Member States. Rising prices for essentials such as food and energy placed a financial strain on households, prompting a shift in expenditure patterns towards essentials. Spending on discretionary items was squeezed, with households drawing down on excess savings built up during the pandemic. Real disposable incomes declined in 12 of the 27 Member States, with the largest contractions seen in Estonia and Lithuania due to their heavy reliance on Russian energy imports, therefore impacting inflation more in these economies (Figure 3).

Figure 3: Growth in disposable income in the five countries with the largest VAT compliance gap (% growth, 2021–2022)

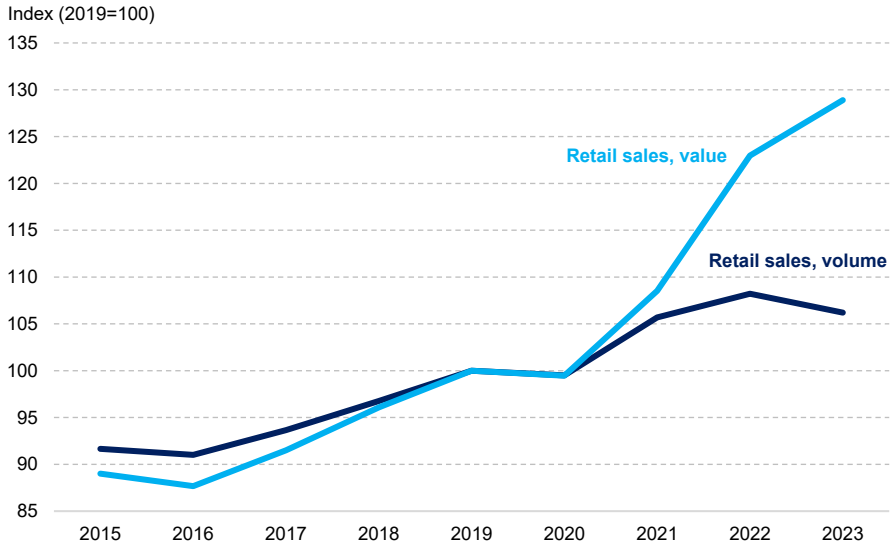


Note: Countries shown in this chart are the top 5 largest in the EU27 in terms of VAT compliance gap (as a percent of the VTTL).

Source: own elaboration base on Eurostat (nasa_10_nf_t), Hellenic Statistical Authority and Statistical Office of the Slovak Republic.

Household final consumption is a proxy for determining the performance of the VAT base, as a large proportion of revenue is generated from household final consumption. **In 2022, real household final consumption increased by 4.1%, down slightly from 4.6% in 2021, serving as a key driver of economic growth in 2022 due to the release of pent-up demand**. This translated to nominal growth of 11.6%, given the elevated rate of price inflation. The significant wedge between nominal and real growth was also seen in retail sales, which in 2022 grew by 2.4% in real terms, and a much stronger 13.3% in nominal terms. In 2023, retail sales volumes declined by 1.9% as the impact of the cost-of-living crisis started to weigh more significantly on household final consumption patterns (Figure 4).

Figure 4: EU27: Retail sales: nominal value and volume (index, 2015–2023)

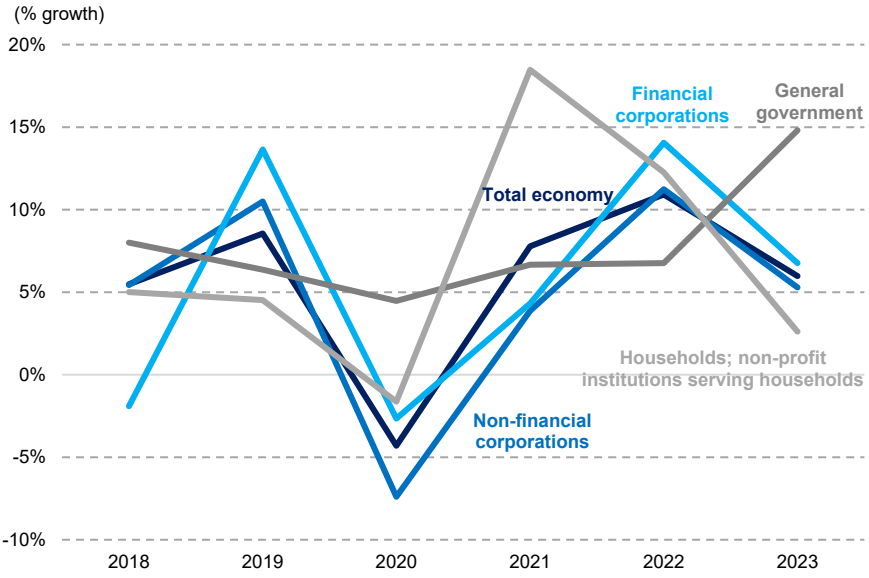


Source: own elaboration based on Eurostat (sts_trtu_m).

Investment by non-deductible entities significantly influenced the VTTL, although taxed investment grew slower than deductible expenses. In 2022, non-financial corporations boosted their investment by 11%, accounting for 57% of the EU27's total investment. Most VAT incurred by businesses is deducted, not directly increasing the tax base. The remaining 43% of investment includes tax base components. Government investment rose by 7%, accounting for 14%, while households and non-profits increased their investment by 12%, contributing 27%**.** Financial corporations, on the other hand, grew by 14%, contributing 3% to total investment in 2022 (Figure 5). Some financial corporations may opt for tax deductions and, consequently, deduct their input VAT, placing it outside of the VAT base.

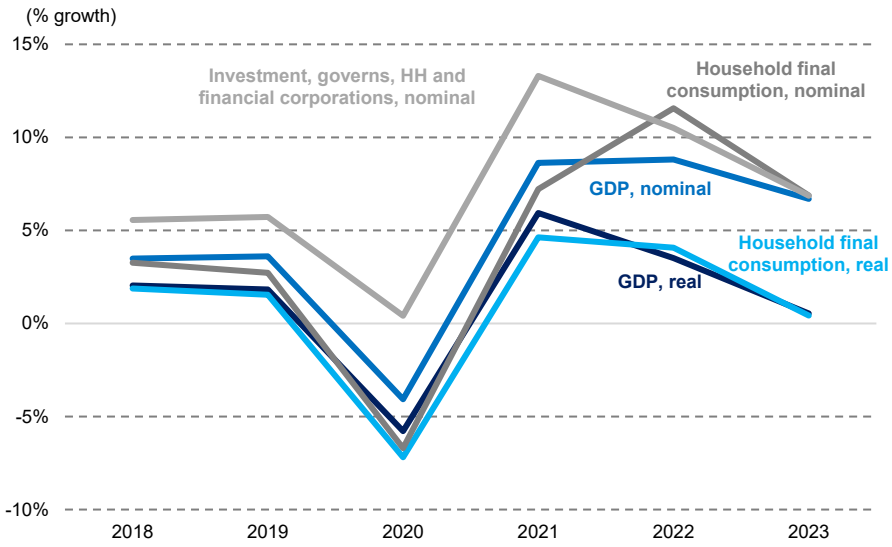
Strong growth in investment across all institutions in 2022 was supported by the EU's Recovery and Resilience Facility, which provided financial support to aid the pandemic recovery, thereby boosting investment. As such, each of these drivers has contributed to increasing VAT revenue through the tax base or the effective rate. However, growth slowed significantly in 2023 as the boost from the pandemic faded and high rates of inflation weighed on real activity across the EU.

Figure 5: Growth in nominal investment (GFCF) by institutions (EU27, % growth, 2018–2023)



Source: own elaboration based on Eurostat (nasa_10_nf_tr).

Figure 6: Growth in GDP, household final consumption and nominal investment by key institutions (EU27, % growth, 2018–2023)



Source: own elaboration based on Eurostat (nama_10_gdp, nasa_10_nf_tr).

Table 1: Key macroeconomic drivers of growth (EU27, % growth, 2021–2023)

	EU27			
	2021(YoY growth)	2022 (YoY growth)	2023 (YoY growth)	Potential impact on VAT revenue
GDP, real	5.9	3.5	0.5	Correlated with growth in the VAT base in the absence of significant price changes
GDP, nominal	8.6	8.8	6.7	Correlated with growth in the VAT base in the absence of significant price changes
Harmonised consumer price inflation	2.9	9.2	6.4	Impacts the effective rate depending on the consumer basket and government support
Disposable income, real	2.2	0.1	0.5	-
Household final consumption, real	4.6	4.1	0.4	Correlated with growth in the VAT base in the absence of significant price changes
Household final consumption, nominal	7.2	11.6	6.9	Correlated with growth in the VAT base in the absence of significant price changes

Source: own elaboration based on Eurostat (nama_10_gdp, nasa_10_nf_tr, prc_hicp_aind).

EU27 cross-country comparison

Despite strong macroeconomic performance at the EU27 aggregate level in 2022, performance across Member States varied significantly throughout the year. This was influenced by each Member State's stage of recovery from the COVID-19 pandemic, the extent of government intervention and support, and the ramifications of Russia's war of aggression against Ukraine on domestic energy prices. These differences are illustrated in Table 2 and Annex F.

Table 2: Macroeconomic summary (% growth, 2021–2022)

Member state	GDP, real 2021 (%)	GDP, real 2022 (%)	GDP, nominal 2021 (%)	GDP, nominal 2022 (%)	Inflation 2021 (%)	Inflation 2022 (%)	Disposable income, real 2021 (%)	Disposable income, real 2022 (%)	Household final consumption, real 2021 (%)	Household final consumption, real 2022 (%)	Household final consumption, nominal 2021 (%)	Household final consumption, nominal 2022 (%)	Business investment, nominal 2021 (%)	Business investment, nominal 2022 (%)
Belgium	6.8	3.0	10.3	9.1	3.2	10.3	2.2	-1.9	6.3	3.2	9.0	13.3	9.3	10.3
Bulgaria	7.1	4.2	15.1	20.6	2.9	13.0	10.7	2.3	8.2	3.8	14.7	20.2	3.0	27.9
Czechia	3.5	2.4	6.9	11.1	3.3	14.8	4.2	-3.8	4.1	-0.6	7.0	14.3	60.2	35.7
Denmark	6.8	2.7	9.9	11.0	1.9	8.5	0.3	2.4	5.5	-1.4	7.6	5.9	10.9	14.9
Germany	3.1	1.9	6.2	7.3	3.2	8.7	-0.4	-0.5	1.5	3.9	4.5	10.9	6.9	13.4
Estonia	7.4	-0.5	13.5	15.6	4.5	19.4	4.7	-5.8	9.3	2.1	13.7	19.3	22.6	0.5
Ireland	14.7	9.6	15.4	16.8	2.4	8.1	3.1	0.6	8.3	9.6	12.3	16.7	-42.4	11.0
Greece	8.1	5.7	9.6	13.4	0.6	9.3	6.5	1.1	6.4	7.5	7.4	14.2	18.0	16.3
Spain	6.4	5.8	9.2	10.2	3.0	8.3	2.4	-2.3	7.1	4.7	9.5	11.6	5.8	8.1
France	6.4	2.5	7.9	5.6	2.1	5.9	2.7	0.3	5.1	2.3	6.7	7.1	13.6	10.4
Croatia	12.6	7.0	14.9	16.0	2.7	10.7	12.0	9.2	10.5	6.7	13.1	18.5	9.9	13.4
Italy	8.3	4.1	9.6	7.9	1.9	8.8	3.1	-1.7	5.5	4.9	7.1	12.9	14.4	15.2
Cyprus	9.9	5.1	12.9	11.4	2.3	8.1	7.7	0.6	5.6	8.6	6.5	15.6	-2.3	20.1
Latvia	6.4	3.5	10.3	15.2	3.2	17.2	3.6	-1.8	7.2	7.4	10.8	21.5	11.0	29.2
Lithuania	6.2	2.4	13.4	19.4	4.6	18.9	3.5	-4.6	7.8	2.0	13.0	21.0	28.6	14.2
Luxembourg	7.2	1.4	12.0	7.6	3.5	8.2	3.5	4.0	11.3	2.3	12.7	7.8	36.6	2.8
Hungary	7.0	4.6	14.0	19.5	5.2	15.3	7.2	1.6	4.6	7.1	11.2	23.3	19.4	15.9
Malta	12.4	8.1	14.7	13.8	0.7	6.1	5.6	4.5	8.1	11.0	9.6	16.9	22.3	64.2
Netherlands	6.2	4.4	9.3	10.2	2.8	11.6	2.4	2.1	4.4	6.5	7.6	13.9	6.8	10.7
Austria	4.4	4.8	6.5	10.4	2.8	8.6	2.1	3.4	4.0	5.8	6.2	13.6	8.4	7.8
Poland	6.9	5.5	12.7	16.7	5.2	13.2	-2.4	0.2	6.2	5.4	12.0	20.2	-1.9	12.6
Portugal	5.7	6.8	7.7	12.2	0.9	8.1	3.1	0.5	4.7	5.6	6.8	13.4	9.6	12.4
Romania	5.7	4.1	11.3	17.9	4.1	12.0	7.5	2.8	7.2	5.8	11.8	21.1	13.6	18.9
Slovenia	8.4	2.9	11.5	9.5	2.1	9.3	4.4	-1.2	10.1	4.1	13.8	14.8	16.3	12.5
Slovakia	4.8	1.8	7.3	9.4	2.8	12.1	1.8	-1.0	2.8	5.6	6.1	18.4	7.6	14.9
Finland	2.8	1.3	5.3	6.8	2.1	7.2	1.1	-2.4	3.2	1.8	5.5	8.1	7.9	8.3
Sweden	5.9	2.7	8.8	8.9	2.7	8.1	4.0	-0.1	6.2	2.4	8.2	9.3	15.4	13.2
EU27	**5.9**	**3.5**	**8.6**	**8.8**	**2.9**	**9.2**	**2.2**	**0.1**	**4.6**	**4.1**	**7.2**	**11.6**	**19.0**	**14.0**

Source: own elaboration based on Eurostat (nama_10_gdp, nasa_10_nf_tr, prc_hicp_aind) and Oxford Economics, download underlying data.

I.b. Developments potentially related to VAT compliance

According to the literature, the relationship between macroeconomic performance and VAT compliance is complex, and is influenced by a complex interplay of such factors as:

- **Structural changes in consumption behaviour:**
    - **Demand approach: Household final consumption by category** – household final consumption in service categories can impact compliance negatively, as the services sector can be more complex and hence more difficult to tax effectively compared to traditional taxable goods.
    - **Production approach: Sectoral growth patterns in an economy** – services sectors can affect compliance negatively, due to the diversity and intangibility of services and cross-border transactions.
    - **Sectoral growth path: The tourism sector** – some businesses within the tourism sector may operate in the informal economy, worsening the compliance rate.
- **E-commerce** – The rise in e-commerce is leading to an increase in online sales, reducing cash-in-hand transactions. The increase in digital payments should allow for a more traceable audit of VAT collection. However, some difficulties in VAT collection from e-commerce remain. More details on e-commerce and the impact on VAT can be found in Section III.d.
- **Bankruptcy declarations** – A rise in bankruptcy declarations reduces VAT collections, complicating the recovery processes and increasing compliance risks.

In the following section, each of these factors is explored in turn to indicate potential implications for VAT compliance.

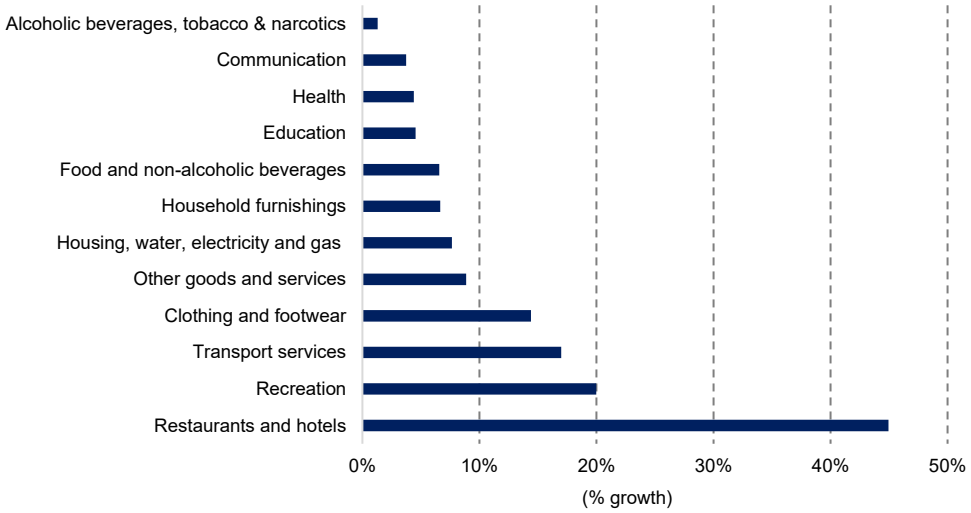
EU27

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **nominal household final consumption performed strongly**, growing by 11.6%, following 7.2% growth in 2021. The fast-paced growth in 2022 was driven by a combination of robust real growth and surge in consumer prices during the year. However, **growth across different expenditure categories varied significantly**. **Restaurants and hotels recorded the strongest growth**, at 45%, followed by recreation at 20%. Strong growth in these sectors was driven by the recovery in the tourism sector across the EU27 and the re-opening of economies for leisure activities. By contrast, **growth in spending on alcoholic beverages and narcotics was modest** of 1.3%. By 2022, **nominal household final consumption in each of the broad categories shown in Figure 7 had surpassed pre-pandemic levels**, except for education, which remained slightly below pre-pandemic levels.

As inflationary pressures were rising in 2022, especially for essentials such as food and energy, **household final consumption on discretionary goods continued to increase as a share of household final consumption**, rising from 38% in 2021 to 39% in 2022, contributing more to the tax base than non-discretionary goods, such as rent, transportation costs and groceries, with lower or zero VAT rates. However, non-discretionary spending still makes up a larger proportion of overall household final consumption. In addition, **a larger proportion of consumer income is spent on goods**, with the share in the EU27 stabilising at around 55% between 2018 and 2023. Overall, the share of household

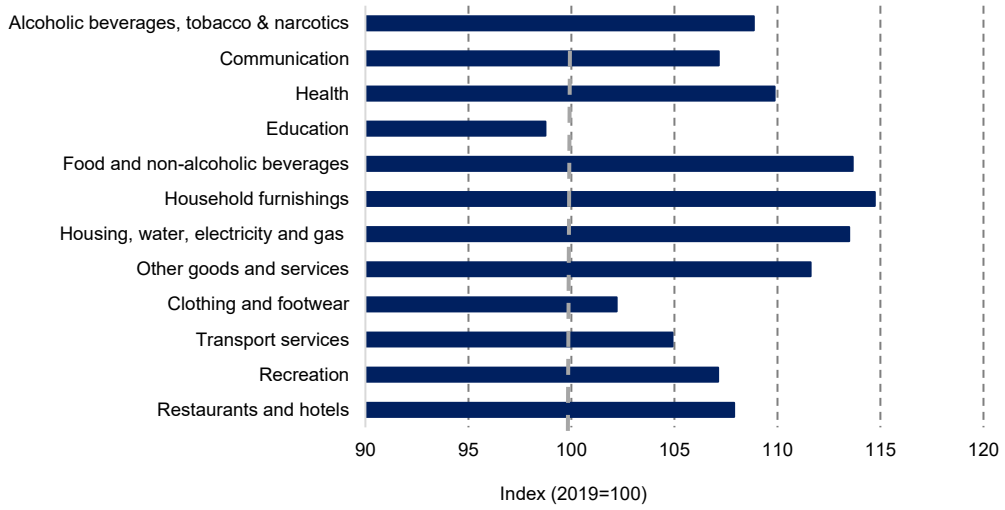
final consumption of services has remained unchanged, which can affect VAT compliance, as compared to traditional taxable goods the services sector can be more complex and hence more difficult to tax effectively.

Figure 7: Growth in nominal household final consumption by COICOP categories (EU27, % annual growth, 2021–2022)



Source: own elaboration based on and Eurostat (nama_10_co3_p3) and National Statistical Institutes.

Figure 8: Nominal household final consumption by COICOP categories (EU27, index, 2022)

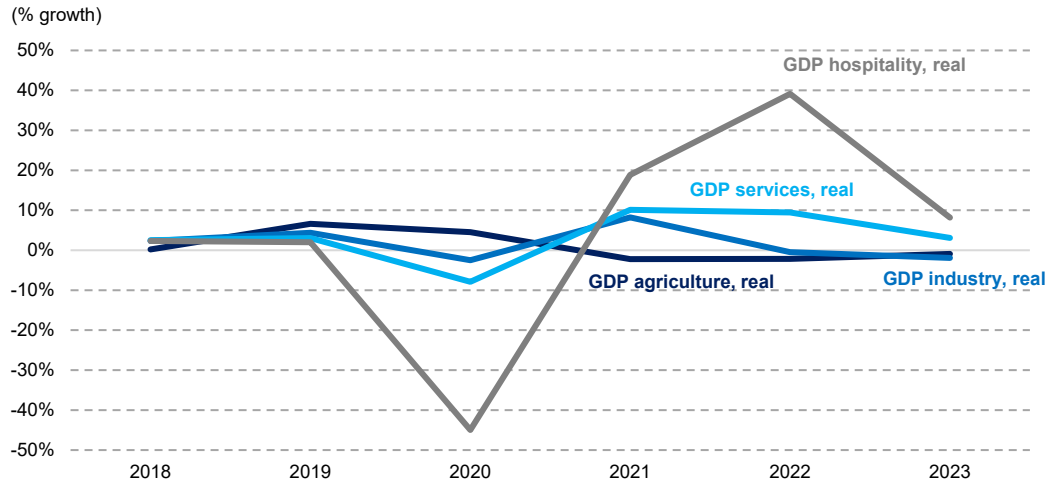


Source: own elaboration based on and Eurostat (nama_10_co3_p3) and National Statistical Institutes.

At a broad sectoral level, **the services sector exhibited faster growth in 2022 than agriculture and industry**, with real GDP increasing by 9.5% from the previous year and reaching levels 11% above those recorded pre-pandemic. Within the services sector, **the hospitality sector was one of the hardest hit by the pandemic and had not fully recovered by 2022**, reaching only 91% of its pre-pandemic levels despite robust growth of 18.9% in 2021 and 39.1% in 2022. This growth followed a significant contraction of 45% in 2020. Meanwhile, the **industrial sector declined by 0.5% due to the ongoing energy crisis,** although levels remained 5% above pre-pandemic levels.

While increased activity in the services sector can boost the VAT base, its diversity and intangibility **can lead to a higher risk of non-compliance compared to traditional goods**. It can also be hard to determine the place of supply for services due to digitalisation and cross-border transactions, since different countries' rules can differ in regard to where a service is deemed to be supplied, which can affect VAT revenue and compliance.

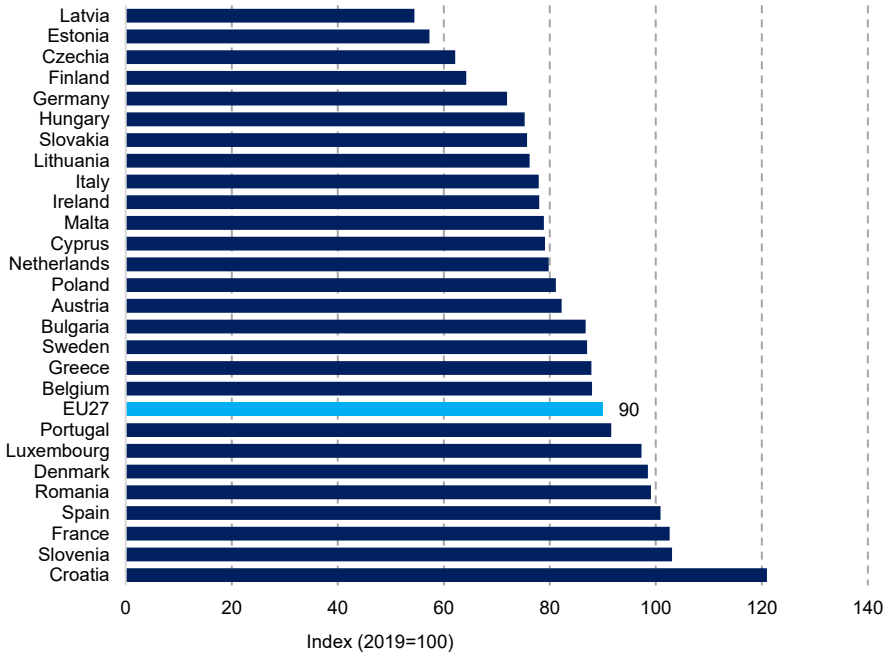
Figure 9: Growth in real GDP sectors (EU27, % growth, 2020–2023)



Source: own elaboration based on Eurostat (nama_10_gdp).

The tourism sector is typically associated with a greater level of non-compliance as businesses such as tour operators or souvenir shops might operate in the informal sector, which means it can be harder to tax them effectively compared to traditional taxable goods. Tourism was among the most severely impacted sectors of the economy during the pandemic, with widespread restrictions on mobility and travel leading to a prolonged period before tourists were permitted to travel again and felt comfortable doing so. **Recovery in tourist arrivals varied across EU Member States**, with some economies, such as Croatia, Slovenia, France, and Spain, rebounding more quickly than others (Figure 10). At the aggregate level, **tourist arrivals in 2022 had not yet returned to pre-pandemic levels**, reaching only 90% of their 2019 levels by the end of 2022. As such, as the tourism sector returns to pre-pandemic levels of activity in the future, it may have detrimental impacts on VAT compliance.

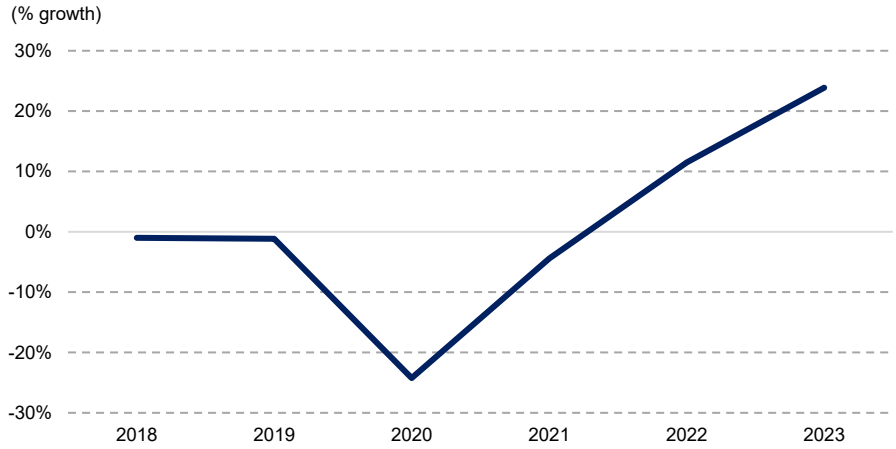
Figure 10: Total tourist arrivals (Index, 2022)



Source: Tourism Economics.

Bankruptcy declarations contribute to VAT non-compliance, complicating the recovery processes and increasing compliance risks, which reduces VAT revenue. Bankruptcy declarations fell to an all-time low in 2020, largely due to COVID-19 as governments introduced temporary measures to help businesses survive the restrictions from the pandemic, which effectively postponed many bankruptcies. When these measures were removed, it resulted in a catch-up effect where firms that had been kept afloat during the pandemic were now filing for insolvency. Therefore, **in 2022 there was a sharp uptick in the number of bankruptcy declarations across the EU27**, with annual growth of 11.5% compared to the previous year. This trend continued into 2023, rising by a further 23.9% (Figure 11). Once the financial support was removed, the financial buffers of **small and micro-sized firms suffered significantly from supply chain pressures** due to the scarcity of essential inputs in some industries (for example semi-conductors), labour shortages following the pandemic, and the ongoing energy crisis in 2022 and 2023 resulting in more firms closing**.** As such, the sharp uptick in bankruptcy declarations in 2022 and 2023 may have detrimental impacts on the VAT compliance gap in the years ahead.

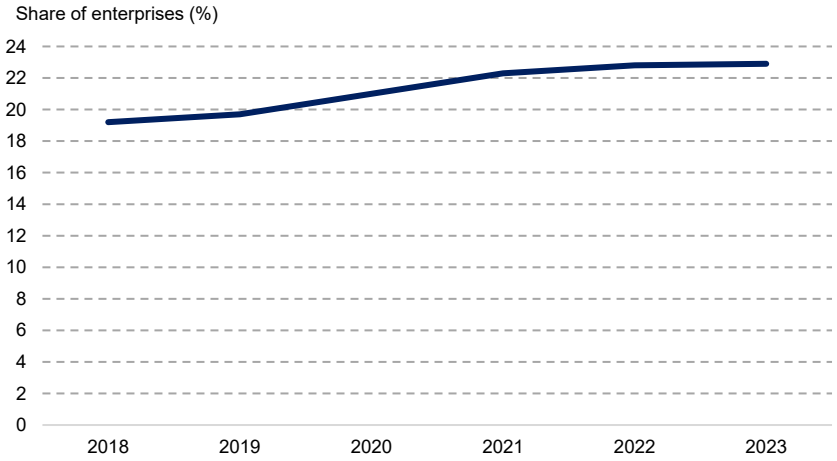
Figure 11: Growth in bankruptcy declaration (EU27, % growth, 2018–2023)



Source: own elaboration based on Eurostat (sts_rb_q).

E-commerce adoption among enterprises within the EU has been on a steady upward trajectory since the onset of the COVID-19 pandemic. In addition, there was an increase in online sales orders during the pandemic in the EU27. Furthermore, the share of businesses engaging in e-sales continues to grow year on year, from 19.7% in 2019 to 22.9% in 2023. The overall effect of e-commerce on VAT compliance can be quite mixed. The increased use of online payments reduces the problem of VAT avoidance in the form of cash-in-hand transactions where money cannot be traced. With online sales, there is an audit trail with money hitting bank accounts and being properly recorded, reducing VAT avoidance and increasing compliance. However, the complexities of e-commerce VAT collection remain and can create challenges for capturing the full potential.[2] More details on e-commerce and the impact on VAT can be found in Section III.d.

Figure 12: Share of enterprises with e-commerce sales (EU27, %, 2018–2023)



Source: own elaboration based on Eurostat (isoc_ec_esels).

After reviewing various factors that may have impacted the VAT compliance gap in the EU27, **it is not possible to conclude what factors may have had more of an impact than others.** However, growth in household final consumption in non-service sectors is most likely supportive of VAT compliance in

[2] *Bohne (2023).*

2022. The rise in e-commerce can have both negative and positive effects, but the increase in online orders will reduce cash-in-hand transactions, making tax avoidance harder. However, growth in the services sector may have impacted compliance negatively, alongside the rise in tourism arrivals and bankruptcy declarations. Despite the challenges, **the compliance rate in the EU27 remained favourable in 2022.** A summary of each economic factor can be found in Table 3, with what we believe to be the expected relationship with VAT compliance.

Table 3: Macroeconomic factors that potentially affect VAT compliance (EU27, % growth/ annual growth pp. difference, 2021–2022)

Variable	Annual growth in the variable in 2022 (YoY % change)	PP difference in annual growth of the variable (2022 vs 2021)	Sign of the expected impact on VAT compliance
Nominal household final consumption; Food, and non-alcoholic beverages	6.6%	5.3	Positive
Nominal household final consumption; Restaurants, and hotels	45.0%	24.5	Negative
Nominal household final consumption; Customised services aggregate	34.6%	19.9	Negative
GDP services, real	9.5%	-0.7	Negative
GDP, real	3.5%	-2.4	Positive
Total tourism arrivals	70.0%	41.0	Negative
Bankruptcy declarations	11.5%	15.9	Negative
E-commerce, % of sectors	-	0.5	Positive

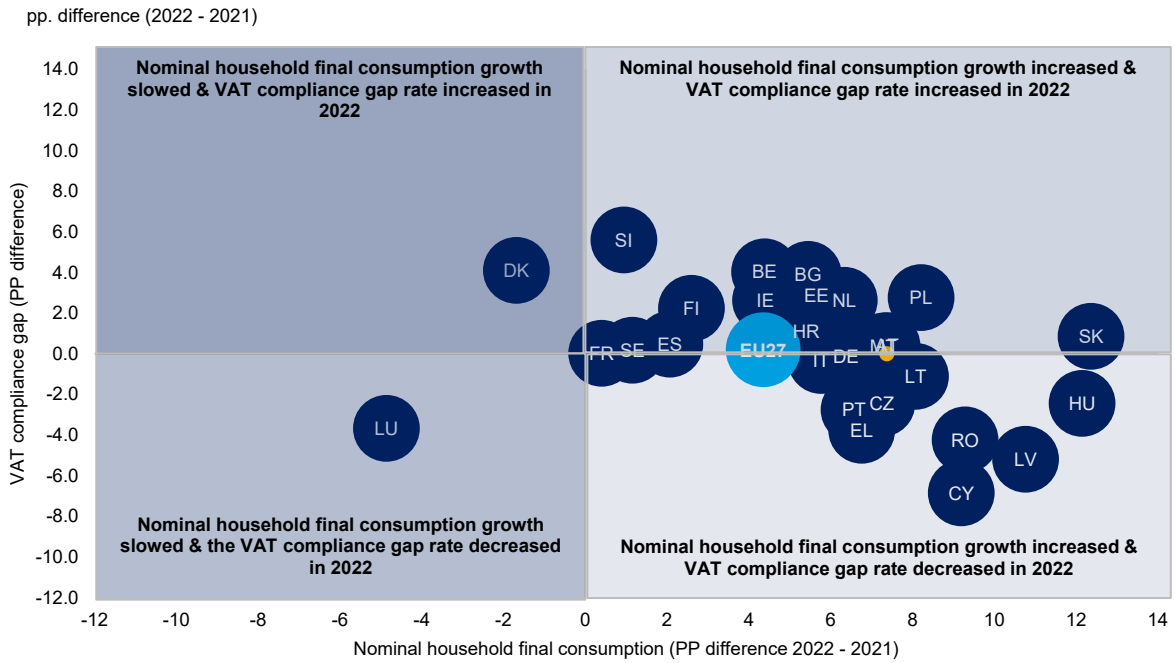
Note: e-commerce figures are based on a percentage, so only PP figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services and other services not elsewhere classified.
Source: own elaboration based on Eurostat and Tourism Economics.

Economic developments and compliance across countries

Analysis of VAT compliance and the macroeconomic drivers potentially associated with it confirms that the relationships are not clear-cut and vary between countries and over time.

The scatter plot in Figure 13 shows the relationship between nominal household final consumption and the compliance rate, and has a roughly equal number of countries in the bottom right and top right quadrants, which shows that nominal household final consumption growth does not have a clear-cut or dominating relationship with the VAT compliance rate across countries.

Figure 13: Nominal household final consumption and VAT compliance gap (annual growth pp. difference, 2022 vs 2021)



Source: own elaboration based on EC/CASE (2023) and Eurostat (nama_10_gdp).

II. Policy context

This chapter summarises changes in VAT regimes in the EU throughout 2022 and 2023, along with their impact on the VAT compliance gap and policy gaps. This initial analysis, necessary for calibrating the parameters of the VTTL model, was based on European Commission sources and specialised online sources on EU VAT.[3] These were further cross-checked with Member State administrations to make sure that all changes were well accounted for.[4]

These changes, both in number and significance, were very substantial. Firstly, numerous instances of temporary relief implemented during the COVID-19 pandemic were phased out in 2022[5] and, to a lesser extent, in 2023. Secondly, due to high and increasing price inflation, many EU Member States decided to introduce temporary VAT-related measures to support households and businesses in the face of higher living and operating costs. The reductions and exemptions primarily concerned energy products and fuels: in 2022, 11 Member States introduced or extended rate cuts or exemptions on such goods.

The expected effect of these measures on the policy gap is mixed, and indeed in line with its stable trend (as discussed in Section IV). The expiration of VAT reductions and exemptions linked to COVID-19 would have reduced the policy gap; at the same time, the measures introduced to fight the effects of the energy crisis and inflation on the cost of living would have increased them.

In 2023, most Member States confirmed or extended the rate cuts and exemptions introduced in response to the costs of living, but some Member States (e.g. Poland and Czechia) began removing them. Other exemptions and rate cuts concerned basic foodstuff and feminine hygiene products, again to counter the effects of the rising inflation. These exemptions or rate reductions are expected, on balance, to increase the policy gap for 2023.

The tourist and leisure sector, and in particular restaurants and accommodation providers, also benefited from rate cuts during and following the COVID-19 pandemic. The situation is mixed, with some Member States (e.g. Slovakia and Lithuania) confirming or extending the cuts, while others have started to rein in cuts previously introduced (e.g. Romania and Ireland). Given the general trend, which is one of discontinuation of these temporary measures, the policy gap in these sectors is expected to decline.

At the EU level, Council Directive 2022/542,[6] adopted in April 2022, introduced significant changes to the EU VAT rate structure. This directive allows EU Member States to apply reduced and zero VAT rates to a broader list of supplies. Key changes include the ability for Member States to apply up to two

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[3] *Sources: 1) European Commission. (n.d.). Taxes in Europe Database v3. Directorate-General for Taxation and Customs Union. Retrieved from [URL]; 2) Sgaravatti, G., S. Tagliapietra, C. Trasi and G. Zachmann (2021) "National policies to shield consumers from rising energy prices", Bruegel Datasets; 3) Hody, O., Roelands, B., and Shinde, S. (2022). Pan European VAT update – Q1 2022. Deloitte Global Tax Center (Europe); 4) OECD (2022), Consumption Tax Trends 2022: VAT/GST and Excise, Core Design Features and Trends, OECD Publishing 5) Eurofiscalis. (n.d.). VAT rates in UE. Retrieved from https://www.eurofiscalis.com/en/vat-rates-in-ue/ ; 6) Marosa. (n.d.). EU VAT. Retrieved from https://marosavat.com/ ; KPMG. TaxNewsFlash-Indirect Tax. Retrieved from https://kpmg.com/xx/en/home/insights/2018/05/taxnewsflash-indirect-tax.html 7) Tax Foundation. (n.d.). EU VAT Rates & EU VAT Directive. Retrieved from https://taxfoundation.org/blog/eu-vat-rates-eu-vat-directive/*

[4] *See the last question in the questionnaire in Annex A.*

[5] *In 2020, the VAT Directive was amended to allow Member States to exempt COVID-19 in-vitro diagnostic tests and vaccines (and the related services). The newly introduced Article 129a was applicable until 31 January 2022. Cf. Council Directive (EU) 2020/2020 of 7 December 2020 amending Directive 2006/112/EC as regards temporary measures in relation to value added tax applicable to COVID-19 vaccines and in vitro diagnostic medical devices in response to the COVID-19 pandemic.*

[6] *Council Directive (EU) 2022/542 of 5 April 2022 amending Directives 2006/112/EC and (EU) 2020/285 as regards rates of value added tax.*

reduced rates of no less than 5% to specific categories, for example essential goods (such as food or medicine), but also introducing this possibility for goods and services linked to the achievement of the EU Green Deal objectives, such as the installation of solar panels or efficient heating systems, or the supply of renewable energy sources. In addition, Member States can apply super-reduced or zero rates to any good or service that benefits from this treatment in at least one Member State. Following the Directive's implementation, various EU Member States further decreased VAT rates on certain goods or services in 2023 (e.g. Germany and the Netherlands introduced zero-rating for solar panels or their installation), which is expected to lead to an increase of the policy gap in the short-term.

On a different note, Council Directive 2022/542 limited the number of product categories to which reduced or super-reduced rates / zero-rating can be applied (down to 24 and 7 categories respectively), which should progressively come into force before 2032. Specific limitations for certain supplies have also been provided. This is the case for fossil fuels and pesticides, which cannot benefit from reduced rates from 2030 and 2032 respectively, and housing (minimum reduced rate of 12%, from 2042 onwards). This should, as a result, help reduce the policy gap. It is very difficult, at the moment, to predict the net impact of this Directive, considering how it induces an increase in the short-term and then a decline. The net effects will depend on the extent to which Member States add additional exemptions and reductions, and on their subsequent choices, given than the number of categories will be capped. The exclusion from rate reduction of fossil fuels, which represent significant consumption for households and benefits from lower rates in a number of countries, is likely to have a significant positive impact on the policy gap.

On compliance measures and the fight against VAT fraud, the temporary provisions on the optional application by Member States of the reverse charge mechanism to certain supplies at risk of fraud[7] (Article 199a of the VAT Directive) were extended to 2026.[8] At the national level, a number of changes in 2022 concerned e-invoicing and reporting requirements: in Poland, an optional B2B e-invoicing system was introduced; in Romania, SAF-T was made mandatory for 2023 (albeit with a grace period) together with an obligation for B2B e-invoicing for transactions at risk; in Italy, the transmission of e-invoices to foreign suppliers via the public Spatial Data Infrastructure (SDI) platform became mandatory. The introduction or upgrade of reporting and e-invoicing requirements has been proven to have a significant and positive impact on the VAT compliance gap.[9] Other significant changes concerned Slovakia (introduction of split payment, VAT refunds only to bank accounts on the public list) and Slovenia (cost cap for deduction of expenses on electric passenger vehicles, stricter documentary requirements for tax deduction).

In 2023, a significant change concerned Poland, where VAT groups were introduced. This reduces the value of transactions in the scope of VAT but, in principle, does not affect the VTTL or the VAT policy gap. Optional reverse charge on intra-EU supplies were introduced or extended in a number of countries (e.g. Germany and Hungary), and the trend also embraced domestic supplies (such as construction services in Belgium, and waste services in Spain). Those tools proved valuable in reducing the VAT compliance gap. In Malta, new penalties and requirements were introduced for submitting VAT forms and information, including recapitulative statements and VAT returns. In Portugal, local e-invoicing requirements and SAF-T were extended to foreign VAT-registered businesses; and in Romania

[7] *E.g. EU allowances to emit greenhouse gases, mobile telephones and integrated circuits.*

[8] *Cf. Council Directive (EU) 2022/890 of 3 June 2022 amending Directive 2006/112/EC as regards the extension of the application period of the optional reverse charge mechanism in relation to supplies of certain goods and services susceptible to fraud and of the Quick Reaction Mechanism against VAT fraud.*

[9] *Cf. Economisti Associati et al., VAT in the Digital Age – Volume 1 Digital Reporting Requirements, Report for DG TAXUD (2022).*

deployment of the SAF-T and e-Transport systems began for larger taxpayers and higher-risk transactions.

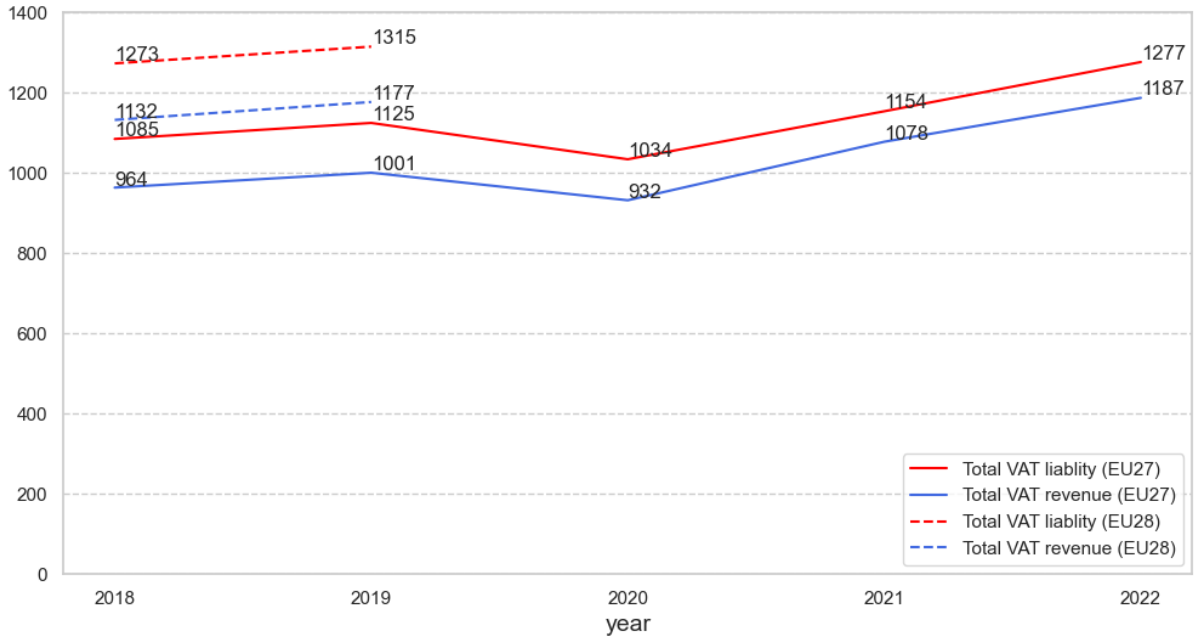
III. VAT compliance gap in the EU

III.a. Evolution of VAT compliance between 2018 and 2022

This section looks at the evolution of the VAT compliance gap over the time horizon of 2018–2022. It aims to provide an overview, while the next section provides comprehensive insights into developments of the VAT compliance gaps in certain Member States.

As shown in Figure 14, total EU27 VAT revenue and VAT liability increased in all years with the exception of 2020, where both fell below the levels observed in 2018. In 2022, both revenue and liability continued the upward trend observed from 2020. However, revenue increased at a slower pace than liability, which means that the VAT compliance gap as a share of the VTTL has increased (Figure 15).

Figure 14: Evolution of VAT liability and revenue in the EU27 (EUR billion, 2018-2022)

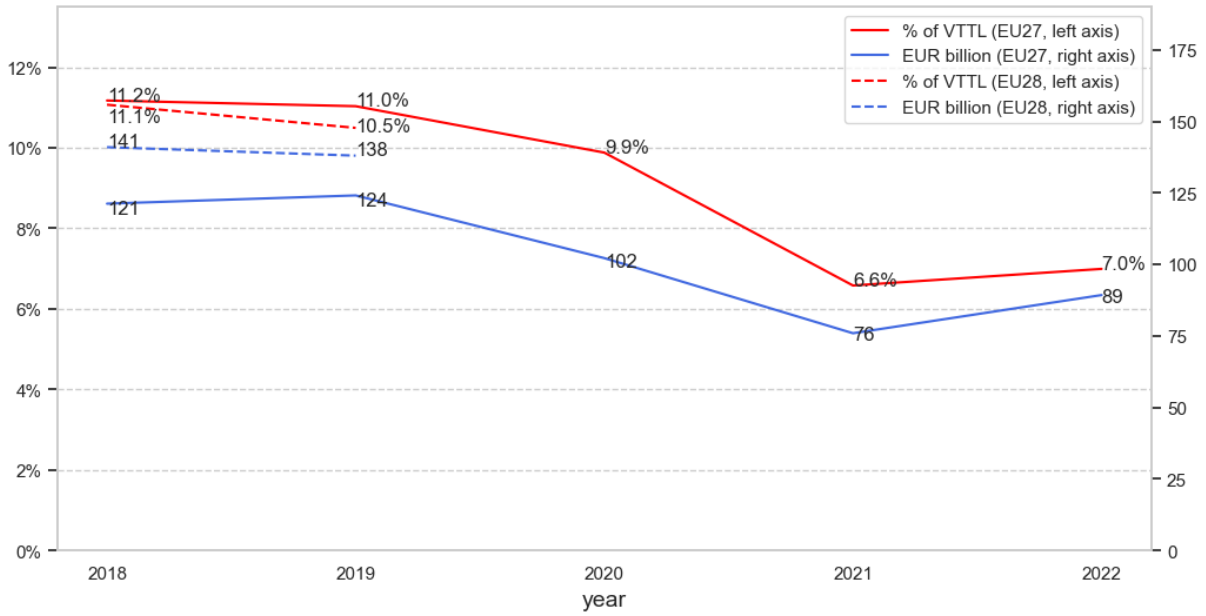


Source: own elaboration, download underlying data.

In 2022, the VAT compliance gap amounted to EUR 89.3 billion, or – in relative terms – 7% of the VTTL. Compared to 2021, the gap went up by EUR 13.3 billion and 0.4 percentage points (of the VTTL) (Figure 15 and Table 4). However, it should be noted that there is a degree of uncertainty around the estimates for 2020 and 2021, and in consequence the year-over-year change in 2022. This is due to the somewhat inconsistent treatment of deferrals, and the lower quality of national statistics owing to the turbulent conditions in these years. For this reason, comparisons of estimates between 2019 and 2022 are more informative than year-to-year change in this period.

Against this backdrop, compared to 2019 – the last pre-pandemic year for which data of similar quality to that of 2022 is available – the nominal gap in 2022 was EUR 35 billion and 4 pp. lower. This means that the reduction in the VAT compliance gap observed during the COVID-19 pandemic largely persisted into 2022.

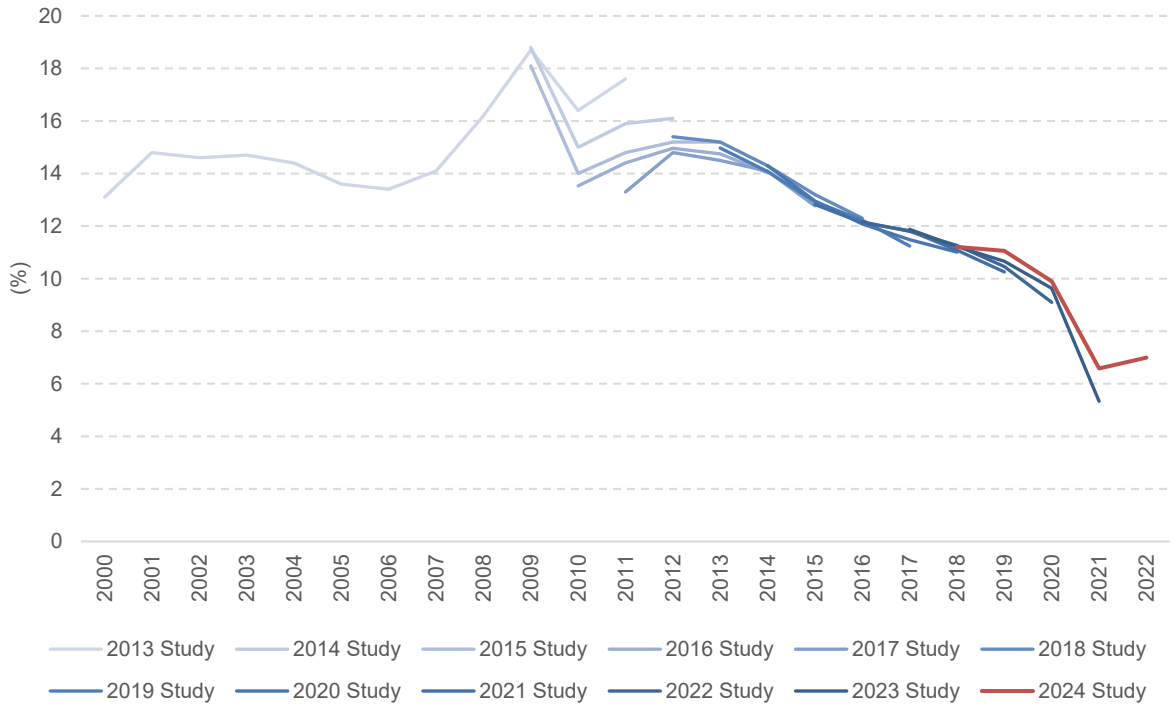
Figure 15: Evolution of VAT compliance gap in the EU27 (EUR billion/%, 2018–2022)



Source: own elaboration, download underlying data.

Because of the problems related to accurately estimating the VAT compliance gap in 2020 and 2021, discussed in more detail in Annex B, the revision of the estimates under this study was larger than during the years preceding the COVID-19 pandemic (Figure 16). The revision of the estimates was 1.3 pp. for 2021 estimates, and 0.3 pp. for 2020.

Figure 16: VAT compliance gap estimates from different editions of the study



Source: own elaboration, download underlying data.

The revision of past VAT compliance gap estimates is much more substantial than during the last 10 years, which warrants a more detailed review. In nominal terms, the upward revision of the 2021

estimates in this 2024 edition of the *VAT gap in the EU* study amounted to approximately EUR 15.3 billion.[10] Of this total, the revision of underlying national accounts data was by far the most influential factor, with an impact of EUR 12.8 billion on the EU27 estimates. The revisions of VAT revenue figures contributed to a decrease in the estimated EU27 VAT compliance gap by EUR 0.9 billion. Changes and refinements introduced by the team had a much smaller impact on the estimates. Changes in the forecasting method increased the liability by EUR 4.6 billion, while adjustments in the model parameters – stemming from both the validation of previous values and natural calibration due to improved data availability – reduced the liability by EUR 1.2 billion. In absolute terms, the largest impacts came from the revisions for Germany, the Netherlands, Spain, and Italy, which together accounted for EUR 14.3 billion.[11]

The median VAT compliance gap in the EU in 2022 was 6% of the VTTL. The estimates of the VAT compliance gap for the majority (18 out of 27) of the Member States ranged from 0 to 10% of the VTTL (see Table 4). The smallest compliance gaps were estimated for Cyprus (-0.7%), Portugal (1.3%) and Ireland (1.7%). Theoretically, the VAT compliance gap cannot be negative, but in Member States where non-compliance is already very low, negative estimates can occur due to statistical and measurement errors (see further discussion in Annex B). On the opposite side of the ranking are Romania (30.6%), Malta (25.9%), Slovakia (14.6%), and Lithuania (14.6%). In nominal terms, the largest gaps were estimated in Italy (EUR 16.3 billion), Germany (12.9 billion) and France (EUR 12.8 billion).

[10] *Compared to the estimate for 2021 in the 2024 edition of the VAT gap in the EU study.*

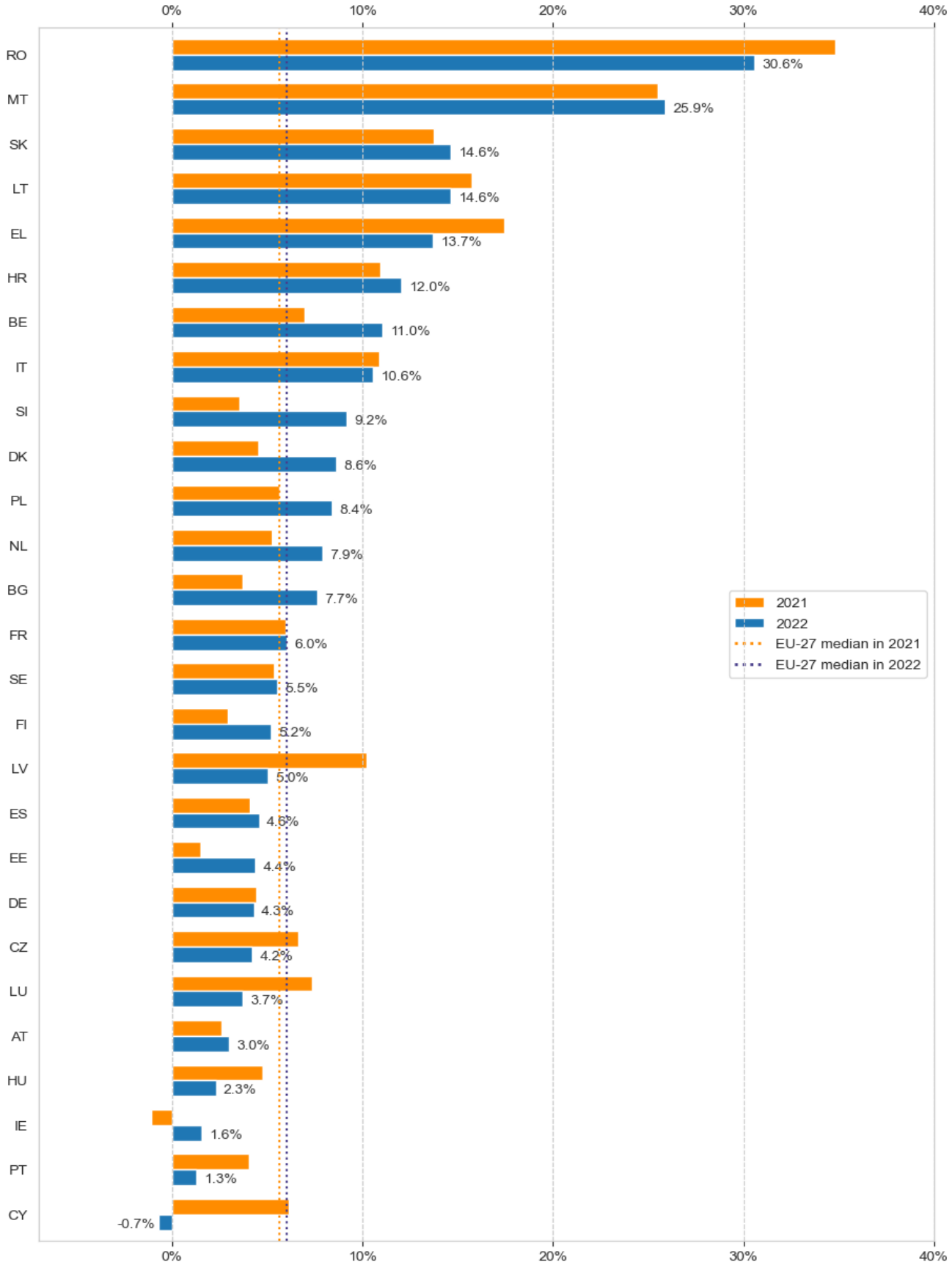
[11] *See the full decomposition of the sources of revisions in Annex A: Sources of revisions for the 2021 estimates.*

Table 4: VAT compliance gap as a percent of the VTTL in EU27 Member States (2021 and 2022)

	2021				2022				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	36 809	34 234	2 575	7.0%	40 501	36 031	4 469	11.0%	4.0
BG	6 930	6 671	259	3.7%	8 432	7 786	645	7.7%	3.9
CZ	19 376	18 084	1 291	6.7%	22 822	21 857	965	4.2%	-2.4
DK	35 371	33 772	1 598	4.5%	38 943	35 583	3 360	8.6%	4.1
DE	271 427	259 435	11 992	4.4%	298 557	285 665	12 892	4.3%	-0.1
EE	2 891	2 847	44	1.5%	3 461	3 309	152	4.4%	2.9
IE	16 637	16 816	- 179	-1.1%	19 238	18 936	302	1.6%	2.6
EL	18 369	15 160	3 209	17.5%	21 580	18 621	2 959	13.7%	-3.8
ES	85 773	82 249	3 524	4.1%	96 787	92 344	4 443	4.6%	0.5
FR	197 189	185 350	11 839	6.0%	212 146	199 362	12 784	6.0%	0.0
HR	8 585	7 647	937	10.9%	10 112	8 895	1 216	12.0%	1.1
IT	135 734	120 980	14 754	10.9%	154 879	138 533	16 346	10.6%	-0.3
CY	2 325	2 182	143	6.2%	2 688	2 706	- 18	-0.7%	-6.8
LV	3 208	2 880	328	10.2%	3 833	3 639	193	5.0%	-5.2
LT	5 562	4 688	875	15.7%	6 610	5 644	966	14.6%	-1.1
LU	4 515	4 183	332	7.4%	4 963	4 779	184	3.7%	-3.7
HU	15 988	15 230	758	4.7%	17 505	17 100	405	2.3%	-2.4
MT	1 343	1 001	342	25.5%	1 605	1 190	415	25.9%	0.4
NL	69 024	65 400	3 624	5.3%	75 919	69 928	5 991	7.9%	2.6
AT	31 473	30 657	817	2.6%	36 643	35 543	1 101	3.0%	0.4
PL	52 260	49 317	2 943	5.6%	52 046	47 672	4 374	8.4%	2.8
PT	19 995	19 186	810	4.0%	23 011	22 711	300	1.3%	-2.7
RO	23 798	15 511	8 287	34.8%	27 717	19 238	8 479	30.6%	-4.2
SI	4 455	4 297	159	3.6%	5 144	4 673	472	9.2%	5.6
SK	8 540	7 366	1 174	13.7%	10 025	8 559	1 466	14.6%	0.9
FI	24 273	23 551	722	3.0%	26 443	25 061	1 382	5.2%	2.3
SE	51 999	49 215	2 784	5.4%	54 993	51 954	3 039	5.5%	0.2
Total (EU27)	**1 153 848**	**1 077 907**	**75 941**	**6.58%**	**1 276 601**	**1 187 318**	**89 283**	**6.99%**	**0.4**
Median (EU27)				**5.63%**				**6.03%**	

Source: own elaboration, download underlying data.

Figure 17: VAT compliance gap by Member State (as % of VTTL, 2021 vs. 2022)

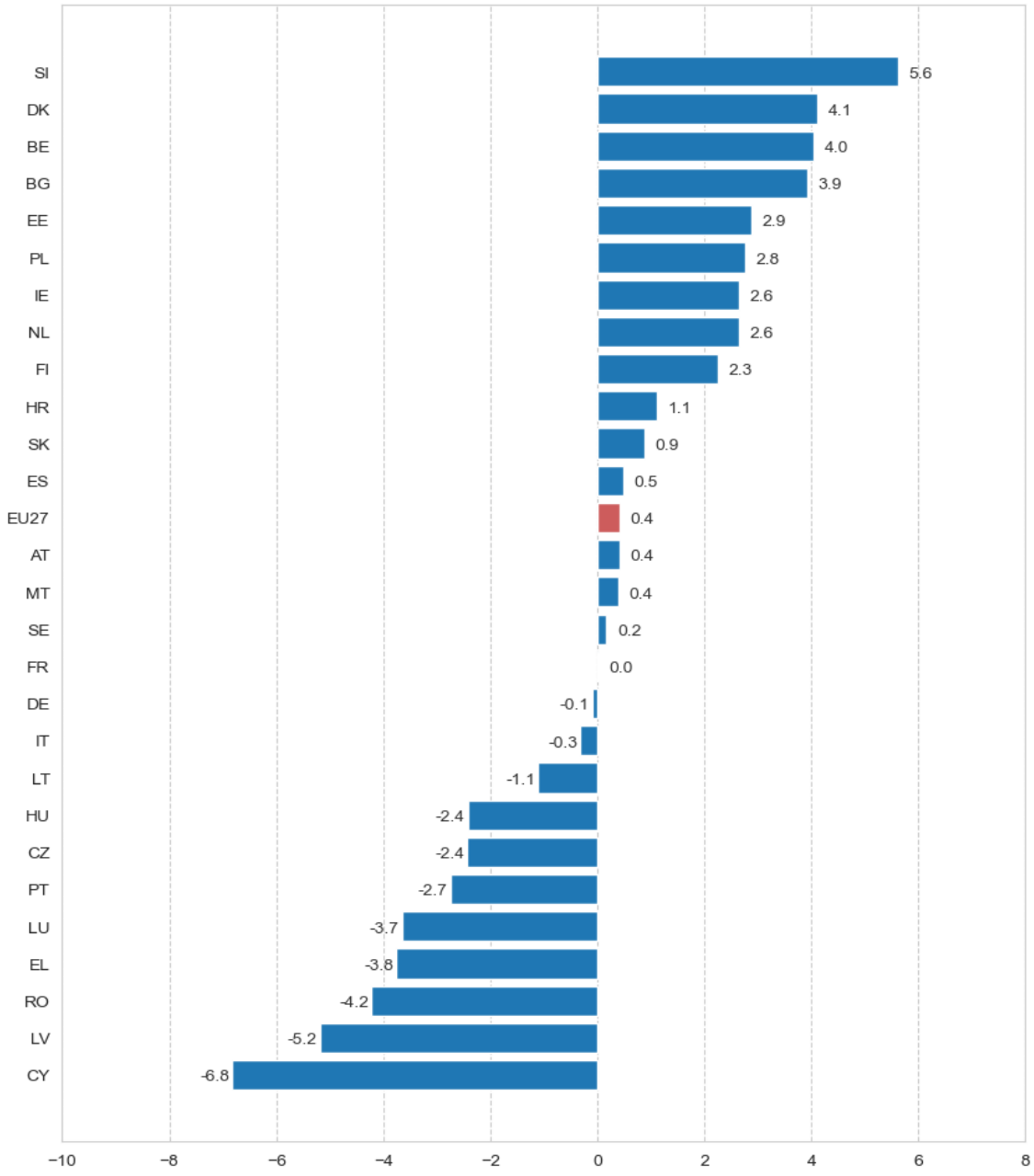


Source: own elaboration, download underlying data.

Looking at Member State-level estimates, in 2022 there was a relatively large group of Member States where the gap remained stable compared to the previous year. In eight Member States, the estimated change was less than 1 pp. At the same time, in nine Member States the VAT compliance gap shifted by more than 3 pp. (Figure 18).

The largest decreases in the size of the VAT compliance gap were observed in Cyprus (-6.8 pp), Latvia (-5.2 pp.), and Romania (-4.2 pp.). In Cyprus, this was a continuation of the downward trend marking a decrease in the VAT compliance gap of over 15 pp. over the space of two years. Comparably large decreases in the gap during such a short period of time were rarely observed before. The largest increases in the size of the VAT compliance gap were estimated for Slovenia (+5.6 pp.), Denmark (+4.1 pp), Belgium (+4.0 pp.) and Bulgaria (+3.9 pp.).

Figure 18: Change in the VAT compliance gap (in percentage points, 2022 vs. 2021)



Source: own elaboration, download underlying data.

III.b. COVID-19 pandemic and the VAT compliance gap

The first case study addresses the interlinkages between the COVID-19 pandemic and the development of the VAT compliance gap. Using the developments during the pandemic, two questions were investigated:

(1) is the tourism sector prone to non-compliance, and

(2) do lower VAT rates lead to higher VAT compliance?

The first part of the case study therefore focuses on the tourism and hospitality sectors, whereas the second part analyses the VAT rate reductions in Germany.

Compliance in the tourism and hospitality sectors during the COVID-19 pandemic

The tourism and hospitality sectors, covering accommodation (NACE code 55), food services (NACE code 56), and tourism (NACE code 79), were among the sectors most affected by the pandemic and the related containment measures. The accommodation sector had the second-highest decline in production levels among all sectors in the EU27, just behind the air transport sector (ESTAT, 2024a).[12] With the importance of the tourism and hospitality sectors varying between Member States, this downturn affected Member States differently.

In seven Member States, these sectors are of particular importance due to their large contribution to national GDP (henceforth referred to as "tourist destinations"). In Cyprus, Croatia, Malta, Portugal, Spain, Austria and Greece, the tourism and hospitality sectors[13] contributed a minimum of 2.5% to GDP in 2019 (ESTAT, 2024a; ESTAT, 2024b; ESTAT, 2024c).[14] As shown in Figure 19, travel and tourism spending – as a proxy for the sector's overall contribution to GDP – sharply dropped in all tourist destinations in 2020, aligning with the anticipated negative impact of the COVID-19 pandemic. After 2020, spending started to recover to varying degrees. Forecasts provided by Oxford Economics and the World Travel and Tourism Council (WTTC)[15] estimate that Croatia returned to pre-pandemic levels first, in 2022, followed by Portugal in 2023 (see Figure 19). Malta, Greece, Spain, and Cyprus are expected to fully recover by 2024, and Austria by 2025.

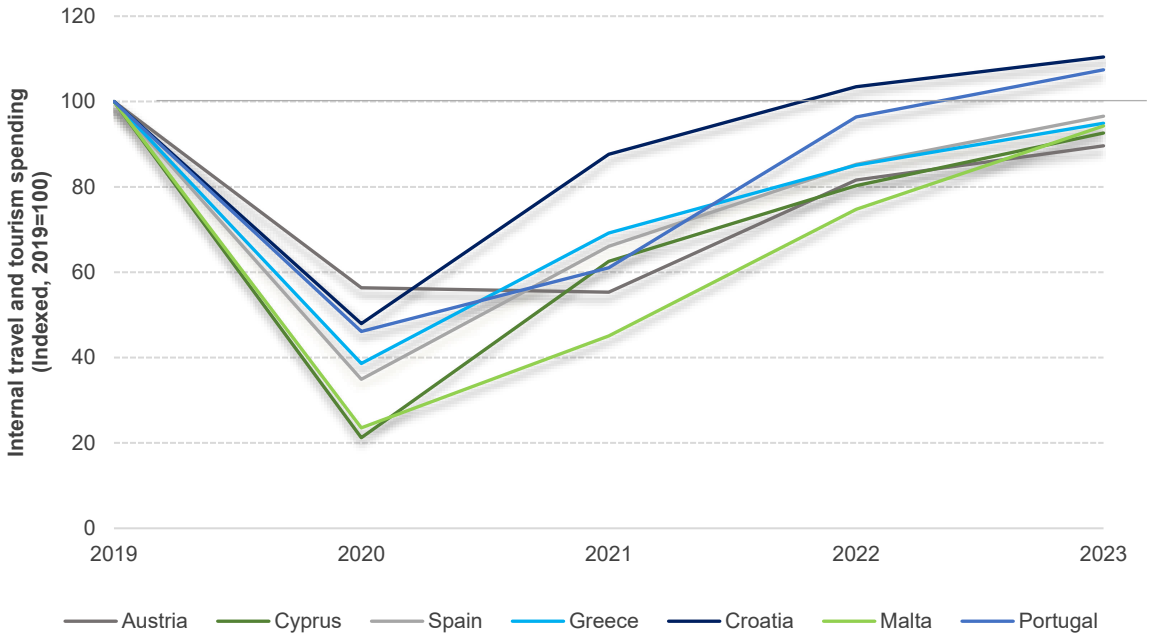
[12] *The food services sector (NACE code 56) ranked fifth among the sectors with the largest decreases in production value in 2020 across the EU27. Data for the tourism sector (NACE code 79) are not available.*

[13] *This sector consists of NACE codes 55, 56, and 79.*

[14] *ESTAT, Annual enterprise statistics for special aggregates of NACE Rev.2 activities (2005-2020) [sbs_na_sca_r2__custom_11777566]: https://ec.europa.eu/eurostat/databrowser/view/sbs_na_sca_r2__custom_11777566/default/table; Enterprise statistics by size class and NACE Rev.2 activity (from 2021 onwards) [sbs_sc_ovw__custom_11786677]: https://ec.europa.eu/eurostat/databrowser/view/sbs_sc_ovw__custom_11786677/default/table; GDP and main components (output, expenditure and income) [nama_10_gdp__custom_11787338] : https://ec.europa.eu/eurostat/databrowser/view/nama_10_gdp__custom_11787338/default/table*

[15] *Estimations and forecasts are based on the International Monetary Fund (IMF), National Statistical Offices and Central Banks (NSO), the Organization for Economic Co-operation and Development (OECD), the United Nations World Tourism Organization (UNWTO), National Tourism Offices (NTO), the World Economic Forum (WEF), and regional tourism associations, such as the European Travel Commission (ETC) or Global Travel Service (GTS) clients.*

Figure 19: Development of real internal travel and tourism spending in tourist destinations (volume, 2019=100)



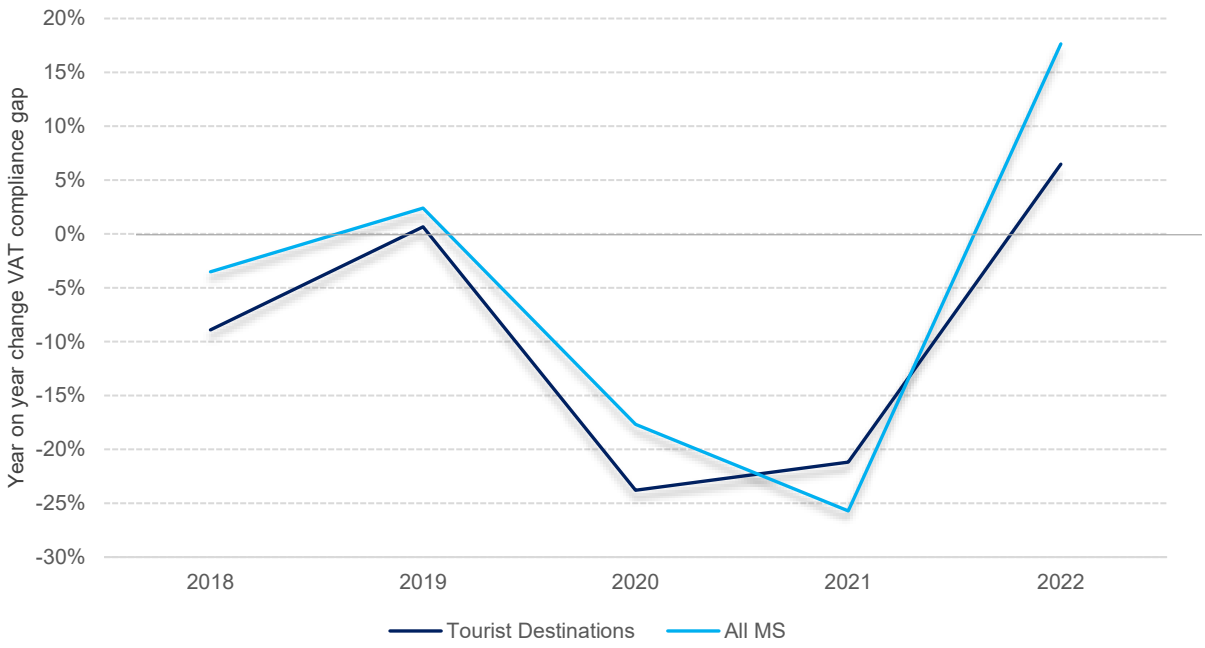
Note: Data for 2022 and 2023 forecasted by Oxford Economics and the World Travel and Tourism Council.

Source: Oxford Economics and WTTC, based on IMF, NSO, OECD, UNWTO, NTO, WEF, and regional tourism associations, such as the ETC or GTS clients.

The distinct impact of the COVID-19 pandemic on the tourism and hospitality sectors, coupled with the sectors' varying importance for Member States' GDP, presents an opportunity to study compliance in the tourism and hospitality sectors. The 2022 *VAT gap in the EU* report (EC, CASE, 2022) first considered the impact of the pandemic on these sectors in its study of compliance in tourism and hospitality. It found that the decrease in the nominal VAT compliance gap in 2020 was higher in Member States where tourism and hospitality had relatively large contributions to GDP. This gave rise to the hypothesis that **"composition effects"** could be driving variation in the VAT compliance gap. That is, if the weight of the tourism and hospitality sectors decreases in relative terms and compliance in the sector is comparatively low to begin with, the total VAT compliance gap is reduced. Building on this hypothesis, this case study investigates the development of VAT compliance in the tourism and hospitality sectors using 2022 estimates to extend the time horizon of the analysis.

Figure 20 illustrates the development of the VAT compliance gap between 2018 and 2022, using the average of all Member States and the average of all tourist destinations. Overall, the VAT compliance gap decreased in all Member States in 2020, yet the decline was more pronounced in tourist destination countries (EC/CASE, 2023) – which supports the composition effects hypothesis.

Figure 20: Growth rate of VAT compliance gap (percent) in tourist destinations versus all Member States (2018-2022)



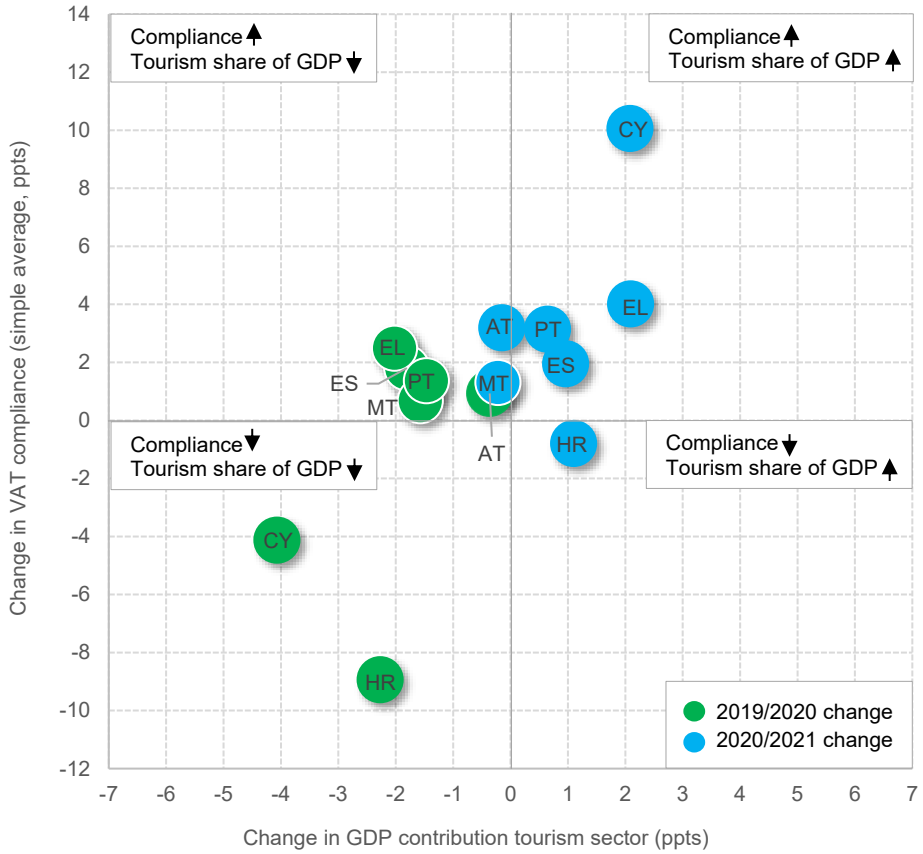
Source: own elaboration, download underlying data.

However, in nominal terms the VAT compliance gap is also impacted, for example, by business cycles and changes in tax legislation. Thus, to investigate VAT compliance further, the VAT compliance gap is studied as a percentage of VTTL. Taking a look at developments at the Member State level also provides more detailed insights.

Figure 21 shows how VAT compliance changed in tourist destinations during the COVID-19 pandemic. Some countries, especially the larger ones, corroborate the composition effects hypothesis – at least in 2020 (green circles). In Spain, Greece, Austria, Portugal and Malta, compliance improved as the tourism sector's contribution to GDP declined in 2020. However, in Croatia and Cyprus, the composition effects hypothesis cannot be confirmed in the same year, as compliance decreased while the tourism sector's contribution to GDP also decreased.[16]

[16] *Moreover, development after the COVID-19 pandemic shows that there might also be a structural shift in the VAT compliance of the hospitality and tourism sectors in selected countries. In Portugal, Greece, and Spain, the sectors' contribution increased again but compliance improved. Hence, even in countries confirming the composition effect during the pandemic, VAT compliance does not decrease when the sectors start recovering in 2021.*

Figure 21: Change in VAT compliance (% of VTTL) and GDP contribution of the tourism sector in tourist destination countries (2019–2021)



Note: 2019/2020 indicates growth rates between 2019 and 2020, and 2020/2021 indicates growth rates between 2020 and 2021.

Source: own elaboration, download underlying data.

When Member States started to recover in 2021, we would have expected compliance to decrease again in line with the composition effects hypothesis. Yet, although the contribution of the tourism sector to GDP increased again in Portugal, Spain, Greece, Cyprus and Croatia, taxpayer compliance continued to improve in most of them (see the blue circles in Figure 21 for Greece, Portugal, Spain, and Cyprus). However, since several other factors also affect VAT compliance, this broad descriptive analysis only provides a preliminary indication.

To investigate the potential reasons for the observed patterns, we conducted interviews with two experts in the tourism industry to gain insights into the compliance of the tourism and hospitality industry and the corresponding composition effects hypothesis. One expert represented an international company active in the tourism sector, the other an association of businesses active in the sector. A description of the methodology applied in the expert interviews can be found in Annex A.

The experts neither contradicted nor confirmed the composition effects hypothesis. Instead, they mentioned several other factors and underlying trends affecting compliance in the tourism sector across countries. One expert mentioned that there had been an overall increase in VAT compliance in the industry for several years due to increased **digitalisation**. This captures several elements, such as digital tools available to companies; as one expert confirmed, "*I would say compliance has increased a lot just because of the tools available to the people and to smaller businesses around the EU".* This

could include accounting software, which can help reduce the risk of unintentional errors while also making intentional fraud more difficult.

Digitalisation has also led to an increase in online bookings of travel and tourism services. This could lead to an increase in compliance with local VAT rules as online bookings typically leave a digital trail. The share of worldwide travel and tourism revenue through online bookings has increased significantly, from 63% in 2018 to 68.81% in 2023, and is forecasted to account for 75% of total revenue in 2029 (Statista, 2024). Additionally, a report published by the EC (EC, 2022a) found that the share of the platform economy by output was higher in the accommodation sector than, for example, in retail trade and transport. Furthermore, the share of digital payments has also increased, leaving a trail not only of online bookings, but all payments made. The positive impact of both effects (III.d. Impact of e-commerce and digital payments on VAT compliance) on VAT compliance can also be corroborated by our empirical findings presented in Case Study 3.

Although the experts agreed on the positive developments in the tourism and hospitality sectors – i.e. increasing VAT compliance – they also confirmed the challenges with VAT compliance. They included the potentially high share of **SMEs** active in the tourism and accommodation sector, with one expert stating *"Generally, it's much harder to have large-scale non-compliance if you're a large company*." Moreover, varying **VAT rates** for different services could confuse businesses when determining the amount of VAT to be paid (see Case Study 2). This is especially true for companies that offer multiple services, and for non-EU operators and travel agents who are often less aware of VAT obligations in the country of operation. Countries with a high share of foreign operators or agents could therefore have higher levels of non-compliance.

In conclusion, we were unable to verify the composition effects hypothesis through the expert interviews. In fact, Figure 21 indicates that a higher contribution of the tourism sector to GDP is associated with higher VAT compliance. Yet since compliance increased in both years (2020 and 2021) in most countries studied, the observed pattern could also be due to compliance increasing over time – irrespective of the tourism sector's development. There are several factors affecting compliance at the country level, making it challenging to draw isolated conclusions on the tourism and hospitality sectors. Even in tourist destinations, the sectors contribute less than 5% to the overall GDP, suggesting that sector developments could have a limited impact on immediately observable macroeconomic outcomes. Moreover, Member States' policy responses to the COVID-19 pandemic and the relief measures introduced could have affected VAT compliance in the wider economy, not just in the tourism and hospitality sectors.

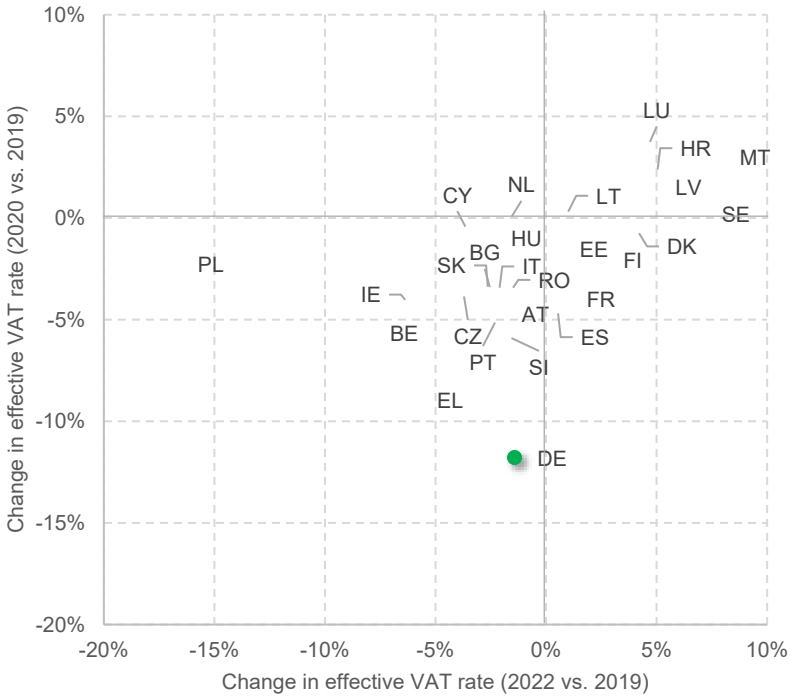
VAT compliance in Germany

In response to the economic challenges posed by the COVID-19 pandemic, German authorities implemented significant reductions in the statutory VAT rate. Between 1 July 2020 and 31 December 2020, the standard rate was reduced from 19% to 16%, while the reduced rate was decreased from 7% to 5% (Bundesgesetzblatt, 2020). The relief measure was further extended for restaurant and catering services. In contrast to the usual 19% VAT, between 1 July 2020 and 31 December 2020, the businesses in the sector were subject to a VAT rate of only 5%. Afterwards, the sector was granted the 7% standard reduced rate until 31 December 2023 (Lexware, 2024). Furthermore, as a response to the war in Ukraine, VAT rates for gas and district heating were reduced from 19% to 7% between October 2022 and March 2024 (Deutscher Bundestag, 2022).

Besides these reductions, consumption patterns in Germany shifted during the COVID-19 pandemic. While households bought fewer services, they increased spending on non-durable goods such as food

products, which are often subject to the reduced VAT rate (ESTAT, 2024d).[17] Together, the VAT rate reductions and shifts in consumption patterns resulted in a major drop in the effective VAT rate, from 10.6% in 2019 to 9.3% in 2020, as illustrated in Figure 22.[18] This constituted the largest drop in the effective VAT rate among all Member States. As of 2022, the effective rate almost returned to the pre-pandemic level in Germany. Therefore, and because the effective VAT rate was relatively stable before the COVID-19 pandemic, the developments in Germany provide a good base to study the impact of the effective VAT rate on compliance. Thus, the case study analyses the correlation between the VAT rate and compliance using descriptive statistics and expert interviews, with selected trade associations having a good oversight on how the VAT rate adjustments have affected businesses.

Figure 22: Changes in effective VAT rate, 2020 and 2022



Source: own elaboration, download underlying data.

The relevant academic literature points towards a positive relationship between the VAT rate and **VAT compliance gap**. Christie & Holzner (2006), for instance, estimated taxpayer compliance rates for VAT, excise tax, personal income tax, and social security contributions for selected European countries in the years 2000 to 2003, and found that compliance rates were negatively correlated with the statutory tax rate itself for all four types of tax. These findings are corroborated by other studies that also proved statistically significant negative relationships between VAT rates and **VAT compliance** or positive relationships between VAT rates and **VAT compliance gaps** (Agha & Haughton, 1996; Zídková & Pavel, 2016). Moreover, they are in line with classical tax compliance theory, according to which taxpayers are utility-maximising agents who will choose to evade taxes if the benefits of tax evasion are expected to outweigh the possible costs of detection and punishment (Allingham & Sandmo, 1972).

[17] *ESTAT, Final consumption aggregates by durability [nama_10_fcs]: https://ec.europa.eu/eurostat/databrowser/view/nama_10_fcs__custom_12856296/default/table*

[18] *The effective rate used in this section is the ratio of the VTTL and the net tax base.*

Notwithstanding the significance of tax rates for compliance, more recent research indicates that the strictly classic tax compliance theory is incomplete, and points to the significance of other factors such as taxpayers' moral values, the perceived fairness of the tax system, satisfaction with public services, and so on (Barbone, Bird, & Vázquez-Caro, 2012). These factors might explain why the EC/CASE (2013) report found that classic tax theory could predict the positive relationship between the VAT burden in a country (measured as VAT revenues divided by GDP) and its **VAT compliance gap** only for countries with high perceived corruption. In contrast, for countries with low perceived corruption, the association was reversed. Other factors discussed in the literature that might affect the VAT compliance gap include judicial and legal effectiveness, which affects the likelihood of detection and punishment (Christie & Holzner, 2006), and (administrative) tax compliance costs, determining the benefits that taxpayers can achieve by evading taxes (Yesegat, 2009).

Descriptive statistics, although not providing conclusive evidence on the causal effect, support the hypothesis that a higher VAT rate leads to lower **VAT compliance**.

Figure 23 displays the relationship between changes in the effective VAT rate and VAT compliance changes across Member States.[19] Part a) of the Figure captures developments around the onset of the COVID-19 pandemic, comparing values for 2019 with those in 2020. However, since data for 2020 may be less certain, and several other aspects could have affected both, the estimated effective rate and VAT compliance in part b) compares pre- and post-pandemic levels, i.e. values for 2019 and 2022.

Both figures show a negative relationship between a change in the effective VAT rate and changes in VAT compliance. Between 2019 and 2020, a 1 percentage point (pp) increase in the effective VAT rate was associated on average with a decrease in VAT compliance of 0.37 pp. Comparing 2022 and 2019, this relationship was even more pronounced; as a 1 pp increase in the effective rate, which was associated with a 0.52 pp decrease in VAT compliance. Considering that both the EC/CASE (2023) also found a negative correlation when comparing 2019 and 2021, the correlation appears quite robust.

[19] *While we referred to the VAT compliance gap previously, this section refers to VAT compliance as it is more intuitive here. The VAT compliance was retrieved using the following formula:* $VAT\ compliance = 1 - VAT\ compliance\ gap$.

Figure 23: Changes in the effective VAT rate and VAT compliance

a) 2019 vs. 2020

b) 2019 vs. 2022

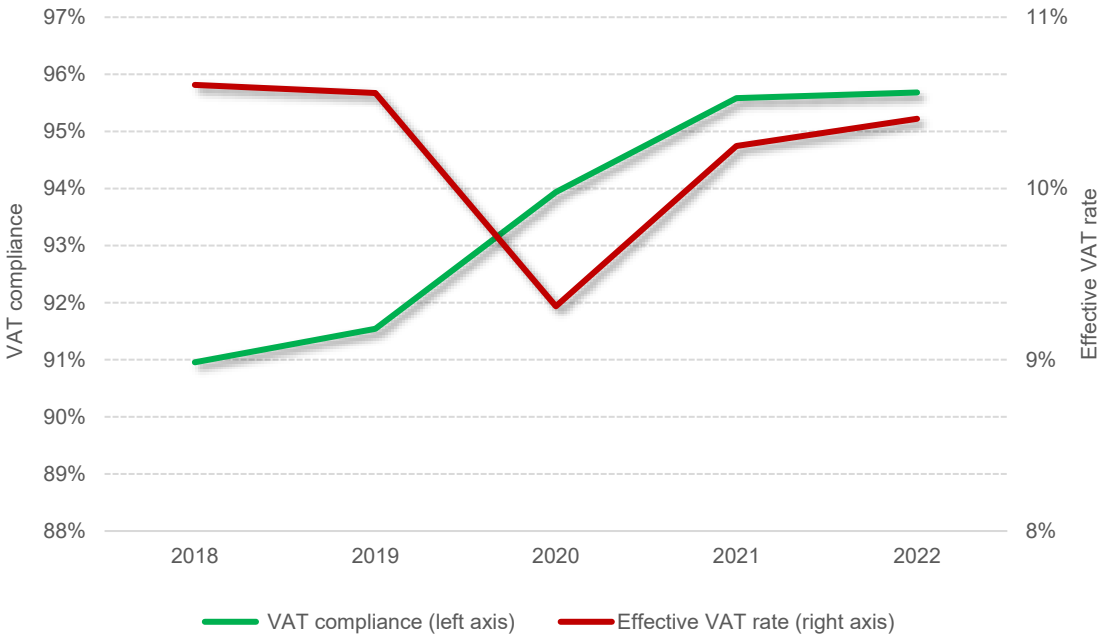
Note: Figure a) $R^2 = 0.186$*, significant at the 5%-level; Figure b)* $R^2 = 0.218$*, significant at the 5%-level;*

For part a) changes have been calculated using the following formulas: $Change\ in\ effective\ VAT\ rate = \frac{Effective\ VAT\ rate\ (2020)}{Effective\ VAT\ rate\ (2019)} - 1$ *and* $Change\ in\ VAT\ compliance = \frac{VAT\ compliance\ (2020)}{VAT\ compliance\ (2019)} - 1$*. The same approach was applied to part b) using 2022 values instead of 2020 values.*

Source: own elaboration, download underlying data.

Reflecting Germany only, the picture is more mixed. As presented in Figure 24, the 2020 drop in the effective VAT rate was indeed associated with an increase in **VAT compliance**. Yet while the effective rate increased in 2021 and 2022, compliance continued to improve, reaching a new maximum in 2022. Thus, the impact of the effective rate seems to only partly explain compliance developments. Other factors appear to have affected VAT compliance as well, which is in line with more recent literature.

Figure 24: Development of VAT compliance and the effective VAT rate in Germany (2018–2022)



Source: own elaboration, download underlying data.

To investigate the role of VAT rate reductions on VAT compliance in Germany in more detail, we conducted qualitative expert interviews with four industry experts holding senior positions in associations representing their respective industries (see Annex A for a detailed description of the methodology).[20] In line with classic tax compliance theory, the experts hypothesised that the reductions in effective VAT rates could have led to (some) increases in compliance, as they reduced the possible benefits of VAT evasion compared to possible costs. However, one expert pointed out that the temporary rate reductions were not unanimously well received, as for some businesses they generated more additional administrative costs and challenges (compliance costs) than benefits. Especially those companies primarily engaged in B2B commerce were critical of this measure (as, because of VAT refunds, they effectively always faced a neutral VAT rate and therefore did not benefit from reduced VAT rates). One expert suggested that the reduction of the VAT compliance gap might have also been driven by reduced economic activity, particularly in economic sectors with a higher risk of VAT evasion.[21] However, an important shortcoming of both theories is that they seem at odds with the empirical finding that VAT compliance continued to improve, even after VAT rates and economic activities returned to pre-COVID-19 levels.

Therefore, most experts referred to other aspects that had contributed to the increase in compliance over the period observed. One expert's hypothesis was that the development of the VAT compliance

[20] *Since all interviews in this part of the case study were conducted in German, we only included indirect quotes of statements made by the experts.*

[21] *This argument is in line with the composition hypothesis stated in the first part of case study one.*

gap was related to the direct monetary aid programmes (Überbrückungshilfen I-IV) that the German government set up during COVID-19 to support businesses. The scale of the government aid for businesses depended on how much companies' revenue had declined by during the pandemic months compared to the same months in 2019. Businesses that had underreported their revenues in 2019 to evade VAT taxes would therefore have received less government support than more honest businesses. Thus, dishonest businesses might have been more prone to go bankrupt during the pandemic, which would have raised the share of honest businesses and, therefore, compliance rates.

Another expert also cited the legal obligation (§1-§5, KassenSichV) for businesses that use electronic cash registers to equip them with technical security devices (TSE) as of 2020 as a possible reason for the reduction of the VAT compliance gap. The TSE ensures that transaction data is stored and secured from manipulation and thereby strengthens the paper trail of transactions. Additionally, the government supported the implementation of TSE-equipped cash registers as part of a COVID-19 relief package (Überbrückungs-Hilfe III) as one expert highlighted. These paper trails effectively deter tax evasion (Pomeranz, 2015) as they serve as possible evidence for tax authorities even if – in response to the obligation introduced – new ways to commit fraud have also been developed (Kleinz, 2024).

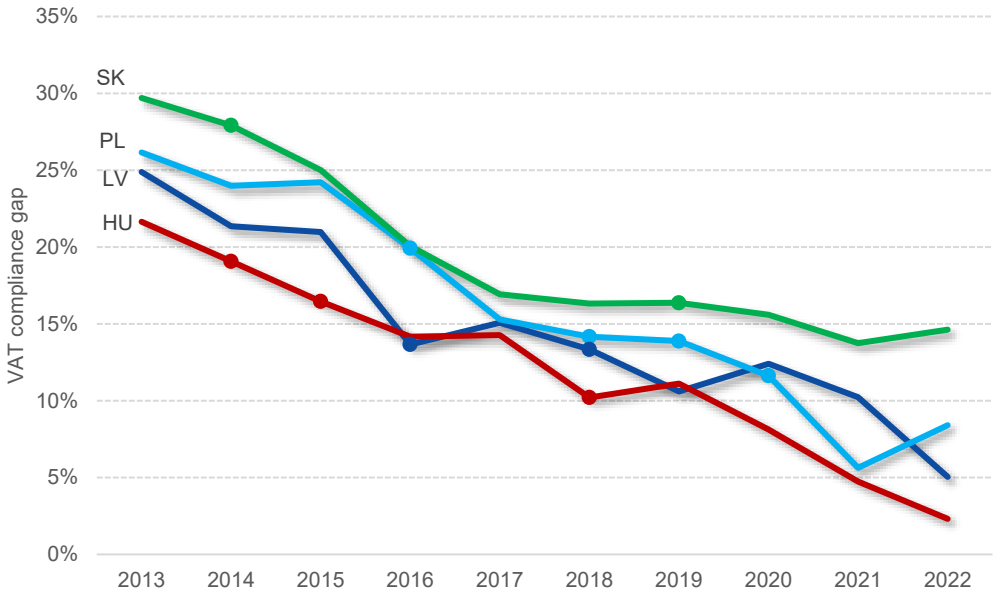
Of course, the digitalisation of payments could have affected the positive developments as well, since these payments leave an electronic trail (see Case Study 3 for an in-depth analysis). While this could be a driver of increasing compliance overall, the COVID-19 pandemic may have played a catalysing role. One expert, for example, highlighted that the share of digital payments increased notably with the onset of the pandemic. A report published by the Deutsche Bundesbank confirms this statement (Deutsche Bundesbank, 2021). This could explain the jump in compliance observed in 2020, and the continued improvements in 2021 and 2022, as most people did not return to cash payments after COVID-19 (Siedenbiedel, 2023).

As such, the experts could neither confirm nor deny that the reduced effective VAT rate led to the observed improvement in VAT compliance. Instead, they agreed that a multitude of factors likely contributed to VAT compliance. Notably, digital solutions (including digital payments) and the TSE obligation for electronic cash registers were mentioned as crucial factors throughout the interviews. They also played a key role when interviewers were asked how to increase VAT compliance in the future. One expert, for example, highlighted the role of electronic invoicing which, in Germany, becomes mandatory for all domestic B2B sales as of 2027 (§14, Umsatzsteuergesetz, UStG). Another expert mentioned, however, that digital solutions also required a digital administration and skilled administrative staff working for tax collection authorities. To fully utilise powerful digital solutions, it is therefore necessary to promote them with businesses as well as the administration.

III.c. Success stories on increasing compliance and associated measures

Several Member States have successfully reduced the VAT compliance gap over the last nine years. The 2023 *VAT gap in the EU* study (EC, CASE, 2023) highlighted four Member States (Hungary, Latvia, Poland and Slovakia) that were particularly successful. The newest estimates confirm Hungary, Poland, Slovakia and Latvia as countries successful in reducing their VAT compliance gap between 2013 and 2022 (see Figure 25).

Figure 25: Development of the VAT compliance gap in selected Member States (2013–2022)



Note: dots indicate major new policy measures.

Source: own elaboration, download underlying data.

Several of these countries introduced tax administration reforms during the same period, suggesting that these policy measures have contributed to higher VAT compliance in these countries (EC, CASE, 2023):

In **Latvia**, the VAT compliance gap decreased by almost 20 ppts between 2013 and 2022. In 2016, the country extended its domestic reverse charge mechanism covering mobile phones, tablets, laptops, and integrated circuit devices as well as cereals and technical crops (Ministry of Finance Republic of Latvia, 2021). VAT compliance increased significantly in the same year, implying the system's success. Moreover, the country kicked off a programme in 2018 to strengthen audit functions and tax compliance in cooperation with the World Bank (The World Bank, 2024). In the same year, the country further extended digital reporting obligations and broadened the rights and powers of the tax administration (EC, CASE, 2023). Considering the drop in the VAT compliance gap in 2018 and the following years, the measures could have contributed to the country's success. The Latvian authorities furthermore announced in 2021 that e-invoicing following the Pan-European Public Procurement OnLine (Peppol) standard will be required for certain transactions starting in 2025 (EC, 2023a).[22] Starting in January 2025, e-invoicing will be mandatory for transactions between public administrations and businesses in the government-to-government, business-to-government, and government-to-business segments. From January 2026, e-invoicing will also be required for transactions between companies registered in Latvia within the business-to-business segment.

In **Hungary**, the VAT compliance gap was more than 19 ppts lower in 2022 than in 2013. In 2014, Hungary introduced online cash registers for several sectors.[23] A new regime, the "e-pénztárgép" (ePG), replaced the requirement for online cash registers, with implementation starting in July 2024. The ePG system reports live transactions and VAT data, and subsequently generates e-receipts (Caragher,

[22] *The Peppol standard enables the standardised exchange of documents between business partners, including the transmission of e-invoices, for instance BMI (2022).*

[23] *Sectors covered included retail, accommodation, and food services (Lovics, Szőke, Tóth, & Ván, 2019).*

2024). Starting in 2014, the country's domestic reverse charge mechanism was gradually extended (EC, 2023b). In 2015, the Electronic Public Road Trade Control System (EKÁER) was introduced to combat MTIC fraud (Höflinger, 2019). Lastly, a real-time reporting requirement was implemented in 2018. The system was gradually extended, and in January 2024 the new eVAT platform was confirmed. It goes beyond the OECD's SAF-T and is linked to fiscal cash registers (ePG), among other things (VATCalc, 2024).

In **Poland**, the VAT compliance gap decreased by more than 17.5 ppts between 2013 and 2022. Several measures introduced likely contributed to this success. A reverse charge mechanism was introduced in 2011, and extended in the following years (EC, 2023b). In 2016, a national version of SAF-T was introduced in Poland, gradually extending reporting obligations (VAT update, 2023). Since a notable shift in VAT compliance was observed afterwards, this measure may have been a crucial element contributing to the country's success. One year later, the government introduced a system called the Electronic Transport Supervision System (SENT) to monitor the movement of goods. Furthermore, an early warning system for VAT fraud was introduced in 2018: the IT system of clearing house (STIR) (Sarnowski & Selera, 2019). A voluntary split payment mechanism was established in the same year, and it became mandatory for certain invoices in 2019. Moreover, a Whitelist of taxpayers was first issued that lists verified companies and requires them to verify their business partners (Fornalik, 2019). To handle these new tasks and programmes, the tax administration, customs services, and fiscal audit services were reorganised into a single body, the National Revenue Administration (EC, CASE, 2023). Starting in 2020, the country also introduced online cash registers gradually extending the system to all businesses required to pay VAT (Dosen, 2021). In 2022, Poland established electronic invoicing via the National e-Invoicing System (KSeF) on a voluntary basis (Marosa, 2024). The system will become mandatory for all businesses in 2026 (EC, 2024b).

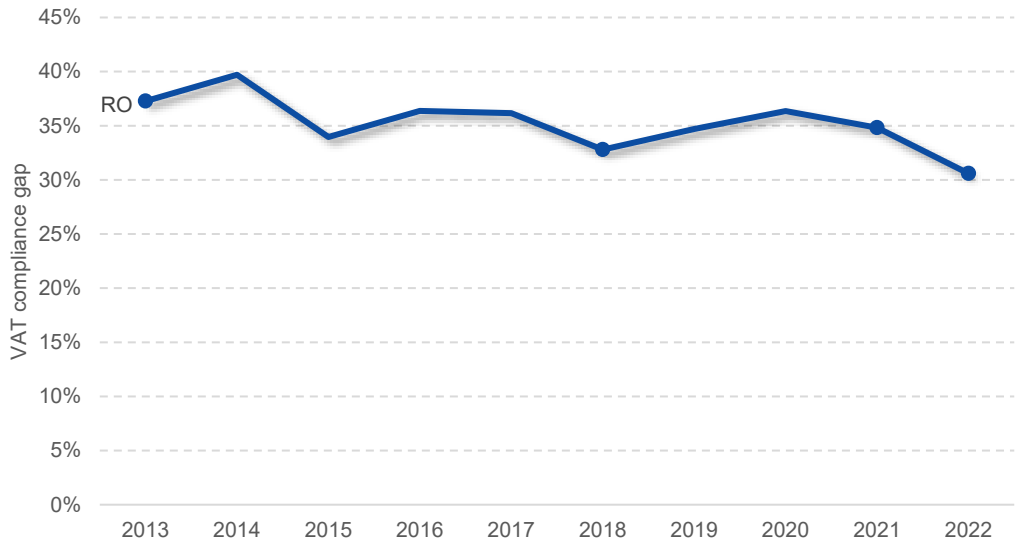
In **Slovakia**, the VAT compliance gap was reduced by more than 15 ppts between 2013 and 2022. In 2014, the government made reporting of detailed transactional data as a supplement to VAT returns obligatory (EC, 2023c). In the same year, the domestic reverse charge mechanism was extended (EC, 2023b). In 2019, Slovakia started to implement electronic invoicing, with a gradual rollout expected to be finalised by 2027 (EC, 2023c). Additionally, online cash registers connected to the Financial Administration Portal were introduced in 2019 (Financial Administration Slovak Republic, 2020).

As illustrated, the relevant Member States introduced several similar measures. All Member States that were particularly successful in reducing their VAT compliance gap had introduced a reverse charge mechanism and electronic reporting obligations. Moreover, online cash registers were implemented in Hungary, Slovakia, and Poland. Another measure that has already been introduced (or is currently in the process of introduction) by all Member States is electronic invoicing. The Ninth Article 12 report highlights some of these measures, including online cash registers and electronic reporting as being particularly promising in reducing the VAT compliance gap (EC, 2022b). Thus, it is reasonable to hypothesise that these policy measures have contributed to the success of the analysed countries.

Then again, other Member States have introduced similar measures without experiencing similar decreases in the VAT compliance gap after their introduction. This includes **Romania**, for instance. Although the country also experienced a slight decrease in its VAT compliance gap between 2013 and 2022, improvements were notably smaller than in other Member States. Romania extended its reverse charge mechanism in 2013 (expanding it further in subsequent years) and introduced a mandatory split payment mechanism in 2018 (which was abolished in 2020). Furthermore, electronic cash registers were established in 2018 with real-time linking to tax authority servers for all businesses since 2021. Moreover, as of 2022, electronic reporting obligations (SAF-T) have been mandatory for large firms, and

were extended to medium-sized enterprises in 2023. Starting in 2025, the system will also be mandatory for small businesses. Notably, the estimates for 2022 indicate a decrease in the Romanian VAT compliance gap of 4.2 pp.

Figure 26: Development of the VAT compliance gap in Romania (2013–2022)



Note: dots indicate major new policy measures.

Source: own elaboration, download underlying data.

Descriptive analysis of measures' effectiveness to increase VAT compliance

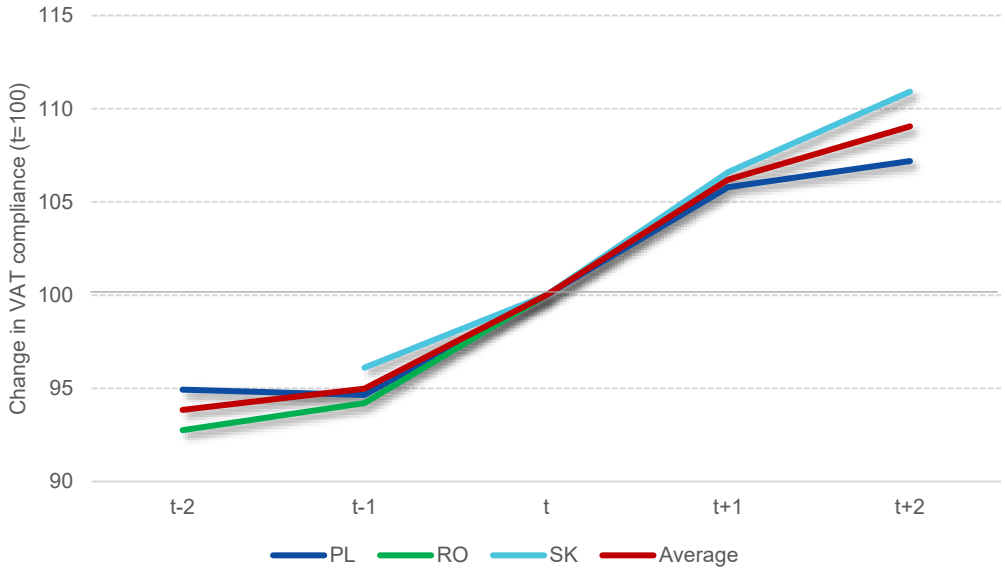
To get a first indication of the measures' effectiveness, we identified two measures linked to the respective tax collecting authority's servers that were introduced by several relevant Member States during the period analysed: electronic VAT returns (such as SAF-T) and online cash registers. Since Member States introduced these measures in different years, we defined *t* as the respective year of the first mandatory measure introduction.[24] *T-1* and *t-2* in Figure 27 and Figure 28 represent the first and second years before introduction of the measure, and *t+1* and *t+2* the two years after it was introduced. SAF-T returns, for example, first became mandatory (for large taxpayers) in Poland in 2016, making 2016 the year of treatment, i.e. *t-1* and *t-2* display VAT compliance for 2015 and 2014, and *t+1* and *t+2* present compliance estimates for 2017 and 2018.

Notably, the pattern for the introduction of SAF-T or other electronic VAT returns looks quite similar in Poland, Romania, and Slovakia. As presented in Figure 27, VAT compliance increased, on average, by 5% in the year of the measure's introduction. As the impact might be delayed and the group of businesses obliged to comply increases, information on compliance in the first and second year after the introduction provides useful information as well. One year after the introduction of electronic VAT returns, compliance increased by another 6% on average compared to the year before. Another year later, and compliance increased by 9% compared to the year of treatment.

[24] *Many measures are gradually introduced starting with a voluntary period, and gradually increasing the group of businesses that have to comply to the measure. Here we identified the year of treatment as the first year with a mandatory introduction for at least some businesses.*

Moving on to online cash registers the picture appears much more mixed. During the period analysed, the measure was introduced in Poland, Hungary, Romania, and Slovakia.

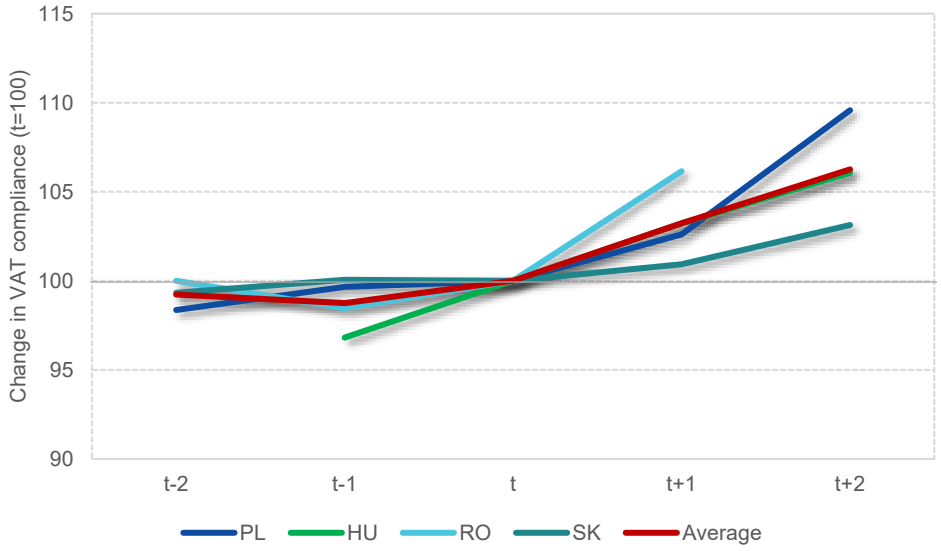
Figure 27: Indexed VAT compliance development two years before and after the introduction of SAF-T or other mandatory electronic VAT returns



Note: t indicates the year of the introduction of mandatory electronic VAT returns for at least some companies. T-1 and t-2 present the corresponding values for VAT compliance 1 and 2 years before the introduction of the measure. T+1 and t+2 represent the years after the introduction of the measure accordingly. In Poland, the year of treatment, i.e. t, was 2016. In Romania, the year of treatment was 2022 and in Slovakia 2014.

Source: own elaboration, download underlying data.

Figure 28: VAT compliance development two years before and after the introduction of mandatory online cash registers



Note: t indicates the year of the introduction of mandatory online cash registers for at least some companies. T-1 and t-2 present the corresponding values for VAT compliance 1 and 2 years before the introduction of the measure. T+1 and t+2 represent the years after the introduction of the measure accordingly. In Poland, the year of treatment, i.e. t, was 2019. In Hungary, the year of treatment was 2014, in Romania, the year of treatment was 2021, and in Slovakia, the year of treatment was 2019.

Source: own elaboration, download underlying data.

In the year of the measure's introduction, *t*, compliance improved notably only in Hungary (3.2%), whereas small improvements were documented in Romania (1.6%). In Poland and Slovakia, compliance remained constant in the year of treatment. One year after the introduction, compliance increased notably in Romania (6%), and by 3% in Poland and Hungary. In Slovakia, compliance improved by 1% only in the year after the measure was introduced. In the second year after the introduction, compliance improved most in Poland, with an increase of 10% in compliance compared to the year of treatment. In Hungary, compliance increased by 6% compared to the year of treatment, and in Slovakia by 3%. Since the measure was introduced in Romania in 2021, compliance in the second year after treatment remains to be seen.

Thus, while the positive impact of obligatory VAT returns on compliance appears quite clear, the picture is much more mixed for online cash registers. However, these conclusions are only indicative, as many factors may have affected VAT compliance in the years considered. First of all, other measures were introduced in the years before and after the identified year of treatment, biasing the descriptive analysis. Secondly, as most measures were introduced gradually, there is no clear cut-off for the treatment period. Thirdly, although the measures introduced can be categorised into groups like electronic reporting obligations, their design and implementation differ between Member States. Thus, a more robust comparison of measures' effectiveness requires a more advanced empirical approach.

Decisive factors impacting VAT compliance and the effectiveness of measures

The impact of new policies introduced to improve VAT compliance varies widely across the analysed Member States. While some countries appear to be quite successful in reducing their VAT compliance gap, others seem to face more challenges, even if they introduced similar measures. We therefore aim to identify which success factors are most effective in increasing VAT compliance when introducing policy measures such as electronic cash registers, reverse charge mechanisms, mandatory electronic VAT reporting, and so on. When comparing countries that have been more and less successful in reducing the VAT compliance gap, decisive factors can be identified.

To investigate factors, we conducted expert interviews with (i) administrative staff of tax authorities, and (ii) representatives of businesses or business associations. A detailed description of the methodology applied is available in Annex A. Overall, the interviews aimed to investigate which factors made the implementation of a specific measure successful or what hindered the implementation or effectiveness of a measure. For this, important lessons can be drawn to inform future policies.

Across the expert interviews there were many varying opinions over which factors should be regarded as key determinants of Member States' success in reducing the VAT compliance gap. In all these interviews, however, **digitalisation** was an important topic. Many of the measures recently introduced by countries such as Hungary, Poland and Romania aimed at reducing the VAT compliance gap built upon digitalised solutions (tax reporting obligations, electronic invoicing, online cash registers, etc.). They can help to establish an electronic trail of transactions, making manipulation and accidental mistakes less likely, speeding up processes and communication between authorities, and can help with the detection of irregularities. Moreover, they help to reduce unintentional errors.

According to the experts, the **measure's design and the quality of the digital solution** are key to increasing compliance. In practice, this may include providing well-functioning software tools to businesses, and connecting the tools used to public actors. Well-designed and well-functioning digital solutions can be implemented by businesses at little additional administrative cost, and they could even have the potential to make businesses' financial management easier and more efficient in the long term, for instance by reducing unintentional errors. They can also reduce instances of unintentional mistakes.

A business representative from Hungary, for example, mentioned Hungary's new eVAT platform in this context, which offers pre-filled VAT returns, reducing the administrative burden for businesses. Furthermore, experts representing the Polish government also emphasised the importance of supporting taxpayers *"by providing solutions that facilitate the performance of obligations"*, mentioning examples such as free tools generating reporting files, pre-filled tax returns, and solutions facilitating contact between taxpayers and the tax administration.

However, if measures and the digital solutions offered are poorly thought out and designed, they might create significant additional costs and burdens without offering many benefits. An expert from Romania confirmed this, stating that the new measures created additional burdens without bringing benefits for businesses: *"It should be mentioned that all costs and compliance efforts were made strictly for the benefit of the state, without direct benefits for the taxpayer in question."* Another expert from Romania summarised the goal of digitalising processes, stating: *"It is not just about digitalising existing processes and moving them online, it is about streamlining them*."

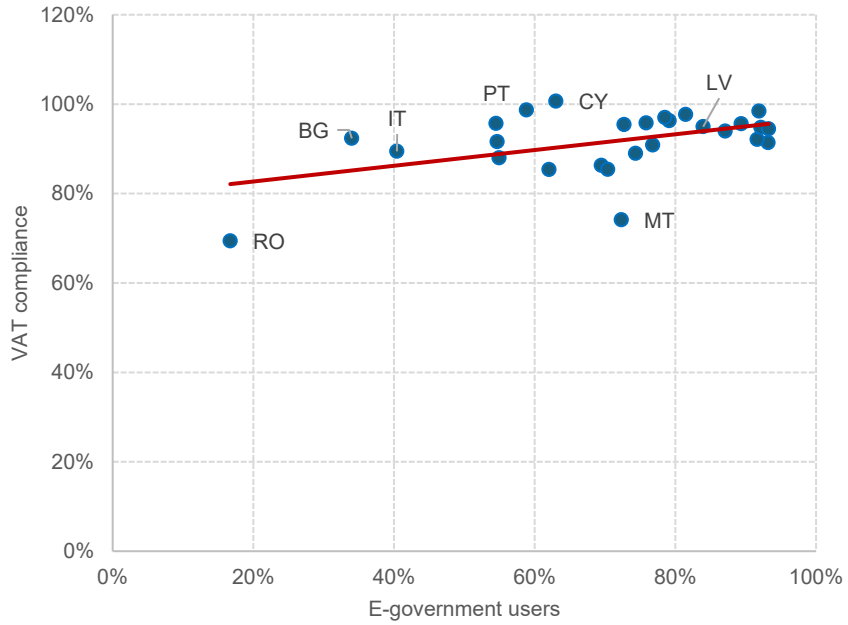
Another crucial aspect related to the design of digital solutions is the **general digital public infrastructure,** including the digital skills of tax authorities' employees. While few digital skills and a bad digital public infrastructure might make the implementation of tax legislation more difficult for businesses and less efficient for the public, it importantly also hampers tax authorities' capacity to monitor and enforce businesses' adherence to tax obligations.

Measures such as electronic invoicing, digital tax reporting obligations and online cashier systems, among others, increase the availability of relevant data that tax authorities can use to audit businesses and ensure proper compliance with tax obligations. If tax authorities have advanced IT infrastructure and the relevant know-how, they can use the available data on taxpayers more effectively to detect fraudulent activities and decrease compliance gaps. Experts representing the Polish government argued that an effectively operating tax authority increases compliance through direct and indirect effects. Effective operations, that is, using IT tools that enable the automatic analysis of tax data, cross-checking with other available data, and verification of compliance with tax laws, have a direct effect as non-compliance is more effectively identified and penalised. However, beyond the direct effects, the experts argued that *"the main benefits of these activities are primarily indirect effects, i.e. increased awareness among entrepreneurs and other taxpayers (…), taking into account the state's greater access to information on the taxpayer"*. This aligns well with the academic literature, which suggests that taxpayers' awareness of tax authorities' auditing efforts significantly deters non-compliance, especially for transactions with a strong paper trail or availability of information (Pomeranz, 2015). It also conforms to the literature, which traditionally argues that compliance should increase when there is a higher probability of detection (Allingham & Sandmo, 1972).

Experts representing Romanian business provided some further evidence for this hypothesis, by arguing that digitalisation efforts have thus far targeted businesses more so than the tax administration itself and the tax administration's internal processes. In Poland, on the other hand, experts speaking for both business and government attested that extensive efforts had gone into building up capacities to process and analyse large amounts of incoming tax and financial data, and that external IT experts were hired to help with this transformation and, among other things, train employees. As a result, the efficiency of audits has gone up according to the experts, and the tax administration's internal processes have been remodelled so that the share of administrative (registration) activities has been reduced in favour of identifying and counteracting irregularities.

A look at the numbers provided by the European Commission (2024c) concerning the Digital Economy and Society Index (DESI) appears to confirm the importance of e-government for VAT compliance. Figure 29 displays the relationship between VAT compliance and the share of individuals who used the internet, in the last 12 months, for interaction with public authorities (e-government users). Across all Member States, the correlation is positive, meaning that a higher share of e-government users is associated with higher VAT compliance. Considering the countries of interest in this case study, Romania had the lowest share of e-government users with 17%. Poland, Hungary, and Slovakia performed much better with 55%, 81%, and 62%, respectively. With 84%, Latvia had the highest share of e-government users among the Member States analysed.

Figure 29: E-government users and VAT compliance (2022)



Note: E-government users describe the share of individuals who used the internet, in the last 12 months, for interaction with public authorities.
The VAT compliance was retrieved using the following formula: $VAT\ compliance = 1 - VAT\ compliance\ gap$

Source: EC (2024c).

Another crucial element of the digital public infrastructure is **the availability and quality of client services and training programmes for businesses provided by (tax) authorities**. This may include basic information provided online such as guidelines and FAQs, training materials for software, online registration and application forms, as well as available contact persons skilled to answer technical and detailed questions quickly. Moreover, efficient digital communication between businesses and tax collecting authorities can help to speed up processes if, for instance, a business makes a wrong declaration by mistake. Many interview partners raised this point, stating that it reduces the cost of the businesses to be compliant.

The DESI data published by EC (2024c) supports this hypothesis. Romania received the lowest score of all EU countries, by a clear margin, on the indicator of digital public services for businesses. This indicator scores countries on a scale from 0 to 100, based on the share of public services needed for starting a business and conducting regular business operations that are available online. The EU average score was 85, and Romania's was 50, with all other countries scoring between 66 and 100.

Additionally, a report by the European Commission found that Romania was the only EU country not providing information online about taxpayers' VAT registration obligations, and one of only five countries not offering VAT registration online (EC, 2022b). The interviewed Romanian experts corroborated these findings by attesting that public administrations in the country were currently only at a very early stage of the digitalisation process.

The **stringency and clarity of government communication** is another aspect mentioned by several experts. They emphasised the importance of authorities explaining both the long-term strategy that they are pursuing, as well as how individual policy measures align with the respective strategy. Further important factors include providing clear guidance on measures introduced and ensuring enough time and resources to adapt to new legislation. All of these factors allow for better predictability of measures, enable businesses to prepare in advance for policy changes, and affect whether measures earn the approval of taxpayers. In this context, Romanian interviewees criticised government communication for its limited coherence and comprehensibility, citing for instance the VAT split payment mechanism, introduced in 2017 and then repealed in 2020, as a cause of confusion.

Linked to clarity and stringency of communication, numerous experts stated the **extent to which businesses are consulted and involved in the development and implementation of new measures**. A Hungarian expert from the business side lauded the authorities for engaging in open dialogue and negotiation before implementing new policies, along with significantly improved client services at the tax administration. In contrast, multiple Romanian experts representing business attested that, while the Romanian Ministry of Finance was now making increased efforts to consult and support businesses, initial consultations were limited and lacked depth, while responses to detailed or technical follow-up questions about the implementation would remain slow. Experts specifically pointed out a legislative change to the VAT reporting regime[25] passed by emergency ordinance in June 2024, with almost no prior consultation with businesses, as a negative example of government behaviour that created significant irritation and pushback in the business community.

One hypothesis explaining why similar policy measures can vary in their successfulness therefore relates to cross-country disparities in factors such as digitalisation, government communication, consultation with business, and tax administrational services, among others. Factors such as these affect how easy and cost-effective it is for businesses to comply with regulations, and hence policy efficacy. As taxpayers in Romania likely faced more severe difficulties and received less support in complying with regulations, they might have committed more accidental mistakes in adopting measures and meeting their tax obligations, or they might have been more incentivised to intentionally evade taxes. In effect, this could go some way towards explaining why policy measures in Romania were less successful in reducing the VAT compliance gap than similar measures in other countries. The academic literature does provide some support for this hypothesis, as it seems to point towards tax compliance rates being significantly affected by tax compliance costs (Erard & Ho, 2003; Abdul & Wang'ombe, 2018).

It also suggests a significant relationship between compliance rates and the tax morale of citizens (Frey & Feld, 2002; Torgler, 2007). This tax morale is significantly negatively related to the level of and recent increases in the perceived tax burden (Lago-Peñas & Lago-Peñas, 2010), positively related to trust in the government, the legal system, and national officers (Torgler, 2004), or, more generally, positively related to the perceived quality of government and government services (Luttmer & Singhal,

[25] *https://www.vatcalc.com/romania/romania-e-vat-pre-filled-vat-returns/*

2014). It is thus easy to see how insufficient government communication and support for businesses, a high perceived compliance burden, and substandard provided digital solutions and other things could have strained Romanian taxpayers' tax morale, thereby counteracting larger compliance as hypothesised by the interviewed experts.

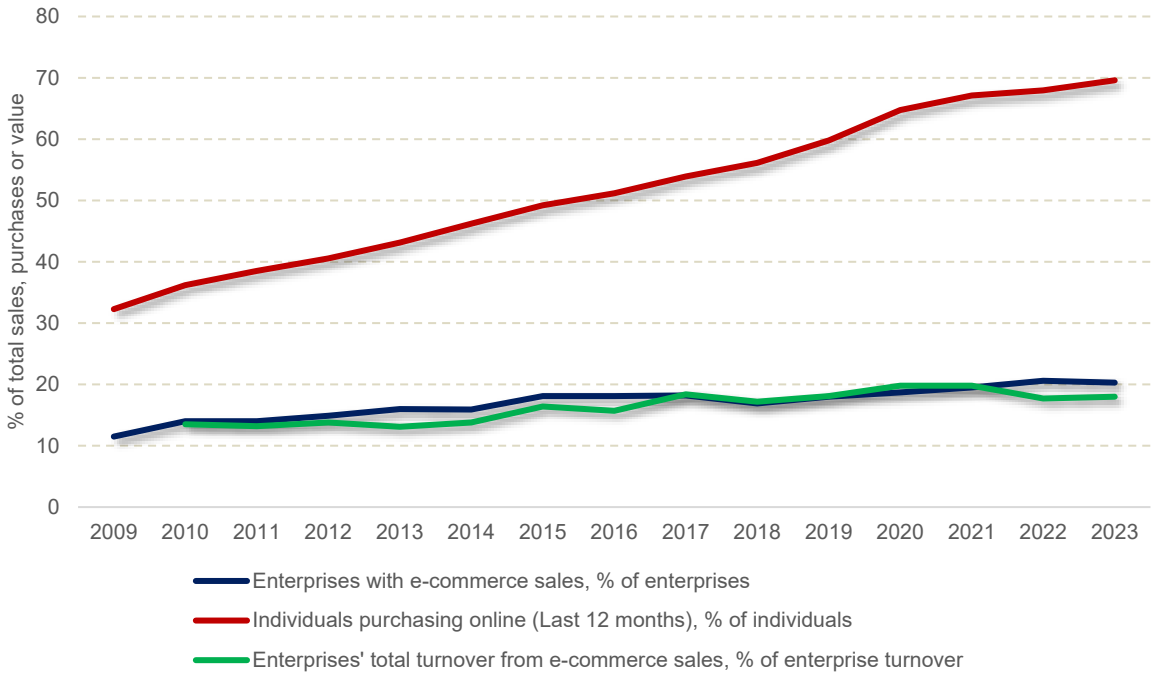
Another reason why similar measures increasing data availability for tax authorities have been more effective in increasing compliance in countries like Poland or Hungary (compared to Romania) is that these measures affect audit and control capacities differently, due to countries' varying ability to effectively leverage collected digital data. In Romania, where the digitalisation of public administration currently seems to be less developed according to the experts interviewed, the infrastructure and expertise to use and process the increased amount of taxpayers' data might be less developed than in Hungary or Poland. It is thus conceivable that the introduced measures failed to facilitate compliance in Romania as strongly as in countries like Poland or Hungary, because the Romanian tax administration might not have the same level of operational effectiveness. Thus, both the direct effect of identifying and punishing non-compliance, as well as the resulting indirect effect of taxpayers being deterred from not complying with obligations due to their awareness of increased administrative audit capacities, might be less pronounced in Romania.

In sum, we identified four main areas that may impact VAT compliance and the effectiveness of newly introduced measures based on the expert interviews conducted. First, the compliance cost faced by taxpayers is a key factor covering not only monetary cost, but also time and human resources. The second crucial aspect is taxpayers' tax morale, meaning their intrinsic willingness and motivation to pay taxes. Importantly, tax morale seems to be strongly affected by the compliance cost. Additionally, tax authorities' capability to monitor businesses and enforce compliance effectively is a key element that also contributes, for instance, to the chances of non-compliant businesses being detected. Lastly, digital tools in particular can also help businesses reduce unintentional errors.

III.d. Impact of e-commerce and digital payments on VAT compliance

The use of digital payments and e-commerce has grown significantly in the last few years. During the COVID-19 pandemic, there was an additional surge, as consumers turned to online retail in response to restrictions preventing them from going to stores physically (Frere & Radhakrishnan, 2020). The share of e-commerce in total business turnover remained stable between 2018 and 2023, as shown in Figure 30. The steady share suggests that the value of e-commerce sales has broadly kept pace with overall business turnover growth.

Figure 30: E-commerce enterprise sales, individual purchases and enterprise turnover (%)



Source: own elaboration based on Eurostat (isoc_ec_eseln2), Eurostat (isoc_ec_ibuy), Eurostat (isoc_sc_ib20) and Eurostat (isoc_ec_evals), download underlying data.

More broadly, the number of card payments, which includes payments made for purchases online and in-store, also increased by 62% in the euro area between 2018 and 2022 (ECB, 2024a).

The observed upward trends in e-commerce transactions could help decrease the VAT compliance gap, as digital payment options leave an electronic audit trail that may help curb tax evasion. Bohne et al. (2023) explored the connection between the proliferation of cashless – or e-money – payments, and value-added tax (VAT) compliance. They found a negative correlation between e-money use and the VAT compliance gap in EU Member States. The researchers estimated that a 1 pp or 5.51% increase in e-money use results in an 11.9% reduction in the VAT compliance gap over time (Bohne, Koumpias, & Tassi, 2023).

While digital payments are perceived as increasing VAT compliance, the assessment of a growing e-commerce sector is mixed. On the one hand, online sales challenge traditional VAT rules, which could potentially reduce VAT compliance and thus increase the VAT compliance gap. Three out of four tax administrations in the EU27 identified a significant number of unregistered businesses in the e-commerce sector (EC, 2022b). Together with the accommodation and food services sectors, e-commerce, despite accounting for a relatively small share of the economy, ranked first on the list of sectors identified by the Member States' tax administrations as having a significant number of unregistered businesses. In particular, the qualification of taxable entities, whether a transaction is B2C or C2C, and imports of low-value goods constitute areas with a significant risk of fraud when enforcing VAT rules with respect to e-commerce sales (Scarcella, 2020). In response, the EC implemented new VAT rules on cross-border B2C e-commerce activities in 2021 (EC, 2024d). Further, a 2023 proposal of the EC puts forward uniform VAT treatment for all persons involved in distance sales of imported goods, regardless of the value of the imported goods. The proposed measures will support the objective of a

single VAT registration and make identifying taxable persons easier, and are expected to improve VAT compliance.[26]

On the other hand, online purchases typically involve digital payment methods. According to the Study on Payment Attitudes of Consumers in the Euro area (SPACE), about 59% of transactions (42% of transaction value) at Points of Sales (POS) were conducted using cash in 2022 in the euro area (ECB, 2022). In contrast, in less than 17% of online purchases (and less than 13% of the online purchase value) the transaction was conducted using cash (ECB, 2022). Since digital payments leave an electronic trail – as mentioned before – an increase in e-commerce could also support VAT compliance.

Digital payments and e-commerce are closely connected. The increasing popularity of digital payments may be driven partly by the developments in e-commerce, since e-commerce payments are conducted using digital payment methods. To investigate the effects of both trends, this case study analyses how both aspects –the rise of e-commerce and digital payments – correlate with VAT compliance. Since increases in e-commerce and digital payment options are hypothesised to have opposing effects on the VAT compliance gap, we consider an analysis of both.

For e-commerce, two main data sources have been used. Data on the e-commerce sales of enterprises is sourced from Eurostat (ESTAT, 2024e).[27] Since enterprises committing VAT fraud are not likely to answer the e-commerce survey questions truthfully, we also tested correlations between VAT compliance gap trends and consumers' e-commerce usage, which is also sourced from Eurostat (ESTAT, 2024f).[28] This covers internet purchases by individuals of physical goods (clothes – including sports clothing, footwear, and accessories), available from 2002 to 2023 for all Member States. As a robustness test, we use internet purchases by individuals of all goods and services from 2020 to 2023 for all Member States (ESTAT, 2024g).[29]

Trends in POS transactions (e-money or cash) are proxied using data on the value of card transactions and cash withdrawals sourced from the European Central Bank payment statistics (ECB, 2024b). Data are available for 27 Member States, starting from 2018 till 2022, although there are data breaks for Member States within this period. The use of cash typically declines as digital payments rise. Trends in the use of cash are proxied using data on cash withdrawals with cards issued by resident Payment Service Providers (PSPs). Data on cash withdrawals are available for all Member States from 2000 onwards, but here again there are data breaks for Member States within this period. To account for the size of the economy, the transaction values in each country and year are expressed relative to the corresponding GDP values (in nominal terms), sourced from our in-house databanks, following the approach used in a similar study by Bohne, et al (2023).

The data used for the VAT compliance gap run from 2000 to 2022, and thus include the most recent estimates for 2022 and revised estimates for 2018–2021.

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[26] *Proposal for a Council Directive amending Directive 2006/112/EC as regards VAT rules relating to taxable persons who facilitate distance sales of imported goods and the application of the special scheme for distance sales of goods imported from third territories or third countries and special arrangements for declaration and payment of import VAT, COM(2020) 854 final, 2020. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?amp;qid=1684913813648&uri=CELEX:52023PC0262.*

[27] *ESTAT, E-commerce sales of enterprises by size class of enterprise: https://ec.europa.eu/eurostat/databrowser/view/isoc_ec_esels/default/table?lang=en&category=isoc.isoc_e.isoc_ec*

[28] *ESTAT, Internet purchases - goods or services: https://ec.europa.eu/eurostat/databrowser/view/isoc_ec_ibgs/default/table?lang=en&category=isoc.isoc_i.isoc_iec*

[29] *ESTAT, Individuals using the internet for buying goods or services: https://ec.europa.eu/eurostat/databrowser/view/tin00096/default/table?lang=en&category=t_isoc.t_isoc_i.t_isoc_iec*

First, several simple correlation coefficients were estimated. Table 5 shows the correlation between the VAT compliance gap and the size of the e-commerce sector. This result is rather unintuitive as e-commerce is generally known to allow for more room for fraud. A potential explanation might be that the digital nature of online transactions could contribute to better record-keeping and transparency. As a result, the overall impact of e-commerce might be associated with improved VAT compliance. However, the results could also be influenced by confounders.

Furthermore, our correlation analysis indicates that the increasing use of digital payments is associated with higher VAT compliance. In particular, credit card usage is found to be negatively correlated with the VAT compliance gap. This concurrence is probably attributable to the electronic audit trail associated with digital payments, and as such conducive to greater compliance. On the other hand, cash usage (proxied by cash withdrawals) is positively correlated with the VAT compliance gap, suggesting that the lack of an audit trail allows for greater non-compliance.

Table 5: Estimated correlation coefficients for the EU27, 2018–2021

Analysis	Variables	Correlation coefficient
Correlation of the e-commerce sector and VAT compliance gap	E-commerce use by enterprises (% of businesses) and VAT compliance gap	-0.52
	E-commerce use by individuals (physical goods, % of individuals)	-0.65
	E-commerce use by individuals (all goods and services, % of individuals)	-0.44
Correlation of digital payments and VAT compliance gap	Value of credit card payments (% of GDP) and VAT compliance gap	-0.18
	Value of cash withdrawals (% of GDP) and VAT compliance gap	0.29

Source: own elaboration. Note: All correlation coefficients significant at the 5% level.

To account for confounders, we also performed a panel analysis. Although we do not aim to perform a causal analysis using this approach, we hope to get more insights into the underlying relationships.

Estimation approach

We undertook an econometric analysis to further explore the relationship between the VAT compliance gap, digital payments, and e-commerce. We used a two-stage instrumental variable panel regression approach, mirroring the approach described in Bohne et al. (2023) but extending it to the entire period for which data are available. The application of the two-stage instrumental variable (IV) approach enabled us to isolate the unbiased impact of digital payments and e-commerce on the VAT compliance gap. This method accounts for potential endogeneity among these variables, which may arise due to exogenous factors that simultaneously influence the VAT compliance gap, digital payments, and e-commerce (for example advancements in digitalisation or overall income growth).

In the first stage of our estimation, we regressed our key independent variable(s), meaning indicators of digital payment, or e-commerce, or both, on our instruments ($Key\ independent\ variable_{ct}$ in the equation). The instruments (X'_{ct}) included are the unemployment rate, the share of urban population, the value added by the industry and trade sectors as a share of GDP, the natural logarithm of population

and public sector corrupt exchanges, and country fixed effects (η_c). The first-stage equation can therefore be summarised as follows:

$$Key\ independent\ variable_{ct} = \eta_c + X'_{ct}\Delta + \varepsilon_{ct}$$

In the second stage of the estimation, we regressed the VAT compliance gap ($VATgap_{ct}$) on the predicted values of the key independent variables from the first stage ($\widehat{Key\ independent\ variable_{ct}}$). The equation also included the same time-varying control variables used in the first stage regression and country fixed effects (α_c). The standard errors were clustered at the country level (u_{ct}).

$$VATgap_{ct} = \alpha_c + \beta_1 \widehat{Key\ independent\ variable_{ct}} + X'_{ct}\tau + u_{ct}$$

Discussion of results

The results from the second stage are summarised in Table 6 below. The first column (1) shows the results from a model where only the digital payment indicator is used. The second (2), third (3), and fourth (4) columns show the results from models where the digital payment indicator is used along with e-commerce indicators, namely individual e-commerce use, business e-commerce size, and business e-commerce use, respectively. The last three columns show the results when the three e-commerce indicators are included but the digital payment indicator is not used.

Our results, as shown in the first four columns, indicate a negative and statistically significant relationship between use of digital payment and the VAT compliance gap, providing indications that the electronic audit trail associated with these payments discourages avoidance, thereby contributing to greater compliance.

When the digital payment or e-commerce indicators are included together, that is, in columns (2), (3), and (4) of Table 6, the coefficient on the digital payment variable remains negative and significant, but the coefficients on the e-commerce variables are not statistically significant. In regressions including the e-commerce variables but not the digital payment variables, the coefficients on the e-commerce variables are negative and statistically significant.

Firstly, these results confirm that increasing e-commerce is correlated with increasing VAT compliance. Although the impact of e-commerce on VAT compliance has been discussed, our results suggest that a higher share of e-commerce is correlated with an increase in VAT compliance, potentially due to the reasons discussed in the previous section.

Secondly, the lack of significant coefficients on the e-commerce variables when the digital payment indicator is included in the regression is symptomatic of multicollinearity between these positively correlated variables. This provides indicative evidence that the use of digital payments and the rise of e-commerce influence VAT compliance through similar channels, meaning through the creation of an auditable trail that discourages avoidance.

Note that these regression outputs do not necessarily imply a causal impact, and therefore should be treated as indicative only. Further detailed analysis is required to establish causal impacts, which is beyond the scope of this study.

Table 6: Second-stage regression results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
E-money (% of GDP)	-0.3829**	-1.1074*	-1.1541***	-1.1567***			
	(0.1587)	(0.5734)	(0.2815)	(0.3178)			
Individual e-commerce use (% of individuals)		0.0020			-0.0011***		
		(0.0013)			(0.0003)		
E-commerce (% of businesses' turnover)			0.0024			-0.0120***	
			(0.0031)			(0.0036)	
Business e-commerce (% of businesses)				0.0016			-0.0139***
				(0.0039)			(0.0045)
Constant	0.1980***	0.2207***	0.2867***	0.2969***	0.1894***	0.3280***	0.4019***
	(0.0197)	(0.0318)	(0.0341)	(0.0423)	(0.0117)	(0.0561)	(0.0844)
Observations	*546*	*445*	*284*	*283*	*468*	*299*	*297*
Number of countries	*27*	*27*	*27*	*27*	*28*	*28*	*28*

*Note: *** p<0.01, ** p<0.05, * p<0.1. All regressions include control variables, estimated coefficients of industry/trade value-added, unemployment rate, % urban population, the natural logarithm of population, and public sector corrupt exchanges omitted for brevity. Standard errors are clustered at the country level in parentheses.*

Source: own elaboration.

As discussed in previous sections, a rise in e-commerce businesses has opposite effects when it comes to VAT compliance. It increases the risk of fraud since regulations and monitoring processes have not yet been fully adapted to digital business models. For example, many e-commerce businesses remain unregistered (EC, 2022b). A counteracting effect is that as most e-commerce transactions are conducted via digital payments, transactions are properly recorded. Our statistical analysis suggests a positive correlation between a rise in e-commerce businesses and VAT compliance. Since it is not possible to find the separate magnitude of each effect or draw causal inferences from our modelling, we cannot confirm the hypothesis that a rise in e-commerce leads to decreased VAT compliance.

A potential explanation for the observed effects may be that the growth of e-commerce has led to a decrease in the number of unregistered small suppliers and an increase in the share of large, registered e-commerce stores. If most online purchases are concentrated among several big e-commerce actors, which are likely to comply with VAT rules, e-commerce could lead to an increase in overall VAT compliance.

IV. VAT policy gap in the EU

For the EU27 overall, the total VAT policy gap level in 2022 was 49.6% of the notional ideal revenue.[30] Of the total value of 49.6%, in 2022 approximately 12.0% can be attributed to the application of various reduced and super reduced rates (see Figure 31). 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 37.5% in 2022. The largest part of the exemption gap is composed of exemptions on services that cannot be taxed in principle, that is, the provision of public goods and imputed rents (20.1% and 7.6%, respectively). As described in Section VII.c, the potential revenue loss from non-taxability of public goods could be further decomposed to education (5%), healthcare (6.5%) and other (8.6%, mostly public administration). The remaining amount of the exemption gap is financial services (2.8%) (see Table 7 and Table 8).

The actionable VAT policy gap – a sum of the VAT rate gap and the actionable VAT exemption gap – was markedly lower than the sum of the non-actionable components. In 2022, it was 19.0% on average. The combined reduction of theoretical revenue due to exemptions that it would be impossible to remove (the non-actionable VAT policy gap) was slightly above 30% of the VTTL.

The main components of the VAT rate gap include agricultural products, foodstuffs, beverages, accommodation and restaurant services. In sum, these components reduced the VTTL by 7.2% of the notional ideal revenue. Another 2.1% was forgone due to the application of reduced rates to transport services, pharmaceuticals and utilities. However, it has to be noted that the liability loss for transport services was largely caused by zero-rated international passenger transport.

The actionable VAT exemption gap was significantly lower than the rate gap – the second component of the actionable policy gap – representing approximately 37% of the total actionable VAT policy gap. The composition of this gap varied widely across countries, incorporating unique elements such as the non-taxability of small enterprises, revenue losses from special regimes in certain regions, and other specific derogations. Further research is required to analyse the breakdown of this component of forgone revenue.

The Member States with the highest VAT policy gap value in 2022 were the same as in 2021 (see Annex E). These were Spain (57.2%), Italy (55.3%) and Greece (54%). The actionable VAT policy gap was the highest in Spain (27%), Greece (26.5%) and Poland (25.4%). The relatively large overall and actionable VAT policy gap in Spain was due to the application of indirect taxes other than VAT 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 VAT policy gaps, substantially lower than the EU average, were estimated for Malta (23.4%) and Bulgaria (31.5%). The very low policy gap in Malta is driven by the VAT exemption gap and its component, the actionable VAT exemption gap. A negative actionable VAT exemption gap arose due to the significant role of gambling sectors providing electronic services abroad and the lack of input VAT deduction rights for these providers. As a result, substantial hidden tax amounts increase overall VAT revenue compared to a scenario in which output is taxable and intermediate inputs are deductible. Consequently, the actionable VAT policy gap in Malta is approximately 0. Similar to the negative exemption gap attributed to gambling services in Malta, a highly negative VAT exemption gap was

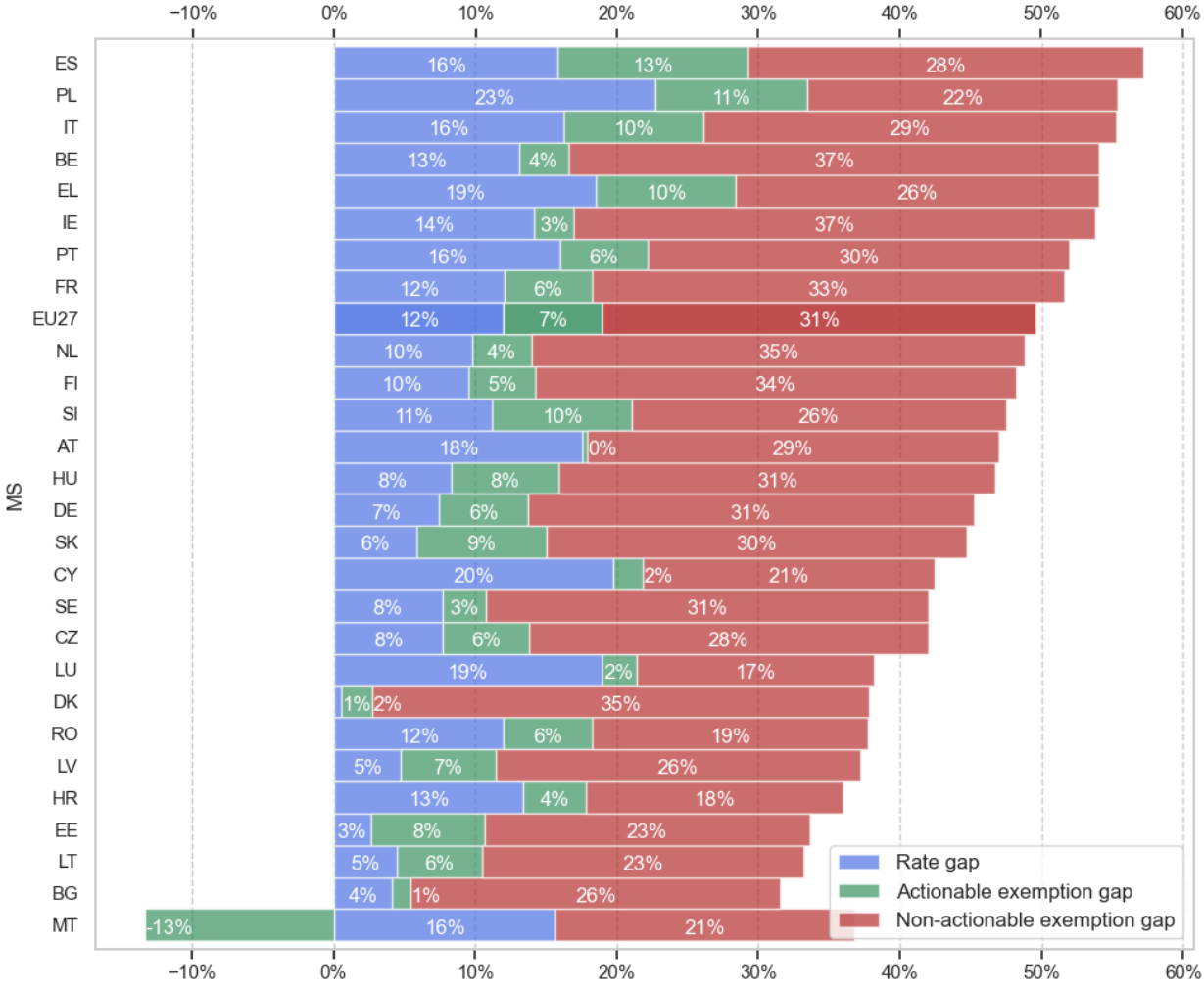
[30] *The EU27 value that is referred to is the total. This total could also be viewed as an average weighted by the notional ideal revenue. In the previous reports, simple averages were quoted instead.*

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 in VAT revenue. At the same time, there would be no gains from output VAT for services provided domestically, as VAT would be deducted downstream.

The actionable standard VAT rate, which represents the single statutory rate that would equalize the current VTTL if all actionable exemptions and reduced rates were repealed, was 16.6% on average in the EU27. This means that completely “flat” systems could have a lower standard VAT rate by approximately 4.9 percentage points to remain VTTL-neutral. The lowest actionable standard VAT rates were estimated for Spain (13%) and Luxembourg (13.2%). The low rate for Spain results from Spain having the largest actionable gap in the EU – due to the application of non-VAT indirect taxes, as discussed earlier in this section. The low gap for Luxembourg is the effect of the interplay between a low statutory standard rate and a large actionable policy gap. For the opposite reasons – relatively high standard rate and low actionable exemption gap – the highest actionable standard VAT rate was estimated for Denmark (23.9%).

C-efficiency, which can be treated as a proxy of both the policy and compliance gap, amounted to 53.2% of net final consumption on average. A C-efficiency above 70% was estimated for two Member States, Luxembourg (79.3%) and Estonia (73.9%). The high efficiency of VAT collection in both of these Member States is a combined effect of having some of the lowest VAT policy and VAT compliance gaps in the EU. The lowest C-efficiency ratios were calculated for Greece (43%) and Spain (44.8%).

Figure 31: VAT policy gap (as % of notional ideal revenue, 2022)



Source: own elaboration, download underlying data.

Table 7: VAT Policy gap, VAT rate gap, VAT exemption gap, non-actionable and actionable VAT gaps (2022)

	A	B	C	D	E	F	G
MS	Policy gap (%)	Rate gap (%)	Exemption gap (%)	Non-actionable exemption gap (%)	Actionable exemption gap (C - D) (%)	Actionable policy gap (B + E) (%)	C-efficiency (%)
BE	54.0	13.1	40.9	37.4	3.5	15.1	46.3
BG	31.5	4.2	27.4	26.1	1.3	4.6	68.4
CZ	42.0	7.7	34.2	28.2	6.1	13.1	63.6
DK	37.8	0.6	37.2	35.1	2.2	3.1	65.8
DE	45.2	7.5	37.8	31.5	6.3	13.3	60.3
EE	33.6	2.6	31.0	23.0	8.0	10.8	73.9
IE	53.8	14.1	39.7	36.8	2.9	15.9	50.4
EL	54.0	18.6	35.5	25.6	9.8	26.5	43.0
ES	57.2	15.8	41.4	27.9	13.5	27.0	44.8
FR	51.6	12.1	39.5	33.3	6.2	17.4	53.0
HR	35.9	13.4	22.5	18.1	4.4	16.4	61.9
IT	55.3	16.3	39.0	29.2	9.9	25.3	45.1
CY	42.4	19.8	22.6	20.5	2.1	21.6	68.6
LV	37.2	4.8	32.4	25.8	6.7	12.5	64.2
LT	33.2	4.5	28.7	22.7	6.0	8.6	60.7
LU	38.1	18.9	19.2	16.8	2.4	22.1	79.3
HU	46.7	8.4	38.3	30.8	7.6	16.7	61.3
MT	23.4	15.7	7.8	21.0	-13.3	0.7	64.1
NL	48.8	9.8	39.0	34.8	4.3	10.9	54.8
AT	47.0	17.6	29.4	29.0	0.3	18.2	60.3
PL	55.4	22.7	32.7	21.9	10.7	25.4	45.9
PT	52.0	16.0	36.0	29.8	6.2	20.0	51.8
RO	37.7	12.0	25.7	19.4	6.3	18.4	52.3
SI	47.5	11.2	36.3	26.4	9.9	18.9	54.8
SK	44.7	5.9	38.8	29.6	9.2	14.4	52.1
FI	48.2	9.5	38.6	33.9	4.7	13.6	59.1
SE	42.0	7.7	34.4	31.3	3.1	10.8	62.9
EU27	**49.6**	**12.0**	**37.5**	**30.6**	**7.0**	**19.0**	**53.2**

Source: own elaboration, download underlying data.

Table 8: Breakdown of non-actionable VAT exemption gap and VAT rate gap, statutory and actionable standard VAT rates (2022)

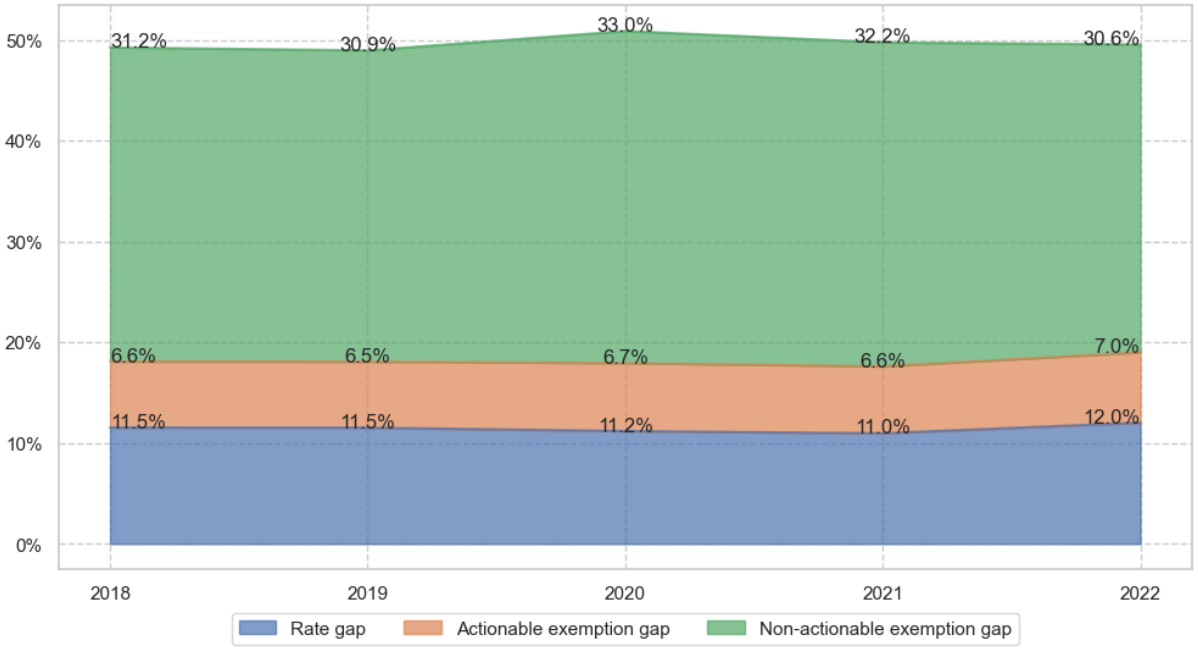
MS	Non-actionable VAT exemption gap (D)					VAT rate gap (B)						VAT rates	
	o/w imputed rents (%)	o/w financial services (%)	Public services			o/w agricultural products, foodstuffs, beverages (%)	o/w pharmaceuticals (%)	o/w transport services (%)	o/w accommodation and restaurant services (%)	o/w utilities (%)	Other (%)	Statutory standard VAT rate (%)	Actionable standard VAT rate (%)
			o/w education (%)	o/w healthcare (%)	Other (%)								
BE	6.7	4.7	7.6	6.1	12.3	5.6	1.1	0.8	1.6	1.7	2.3	21	14.5
BG	8.3	2.0	5.8	3.5	6.4	0.0	0.0	1.5	2.2	0.1	0.3	20	19.2
CZ	8.5	1.7	5.3	6.5	6.3	2.6	0.7	0.5	2.0	0.6	1.3	21	16.6
DK	7.3	4.9	5.8	5.8	11.3	0.0	0.0	0.6	0.0	0.0	0.0	25	23.9
DE	6.4	2.6	5.1	7.4	9.9	4.4	0.1	0.7	1.1	0.3	0.8	19	14.8
EE	6.5	1.9	5.1	4.6	4.9	0.1	0.9	0.5	0.6	0.0	0.6	20	18.1
IE	11.9	3.7	5.5	8.4	7.3	3.5	2.3	2.0	1.6	1.1	3.5	23	15.7
EL	7.7	2.4	5.1	3.8	6.7	5.3	2.2	1.5	3.9	2.1	3.5	24	15.5
ES	8.5	3.0	5.0	5.8	5.7	4.3	1.4	0.8	4.6	0.5	4.2	21	13.0
FR	8.7	2.8	4.9	6.9	10.0	5.7	0.4	0.9	2.0	0.6	2.5	20	14.9
HR	5.9	1.5	0.0	0.0	0.0	4.3	2.3	0.5	3.4	1.6	1.3	25	20.3
IT	9.9	1.8	4.7	7.1	5.6	5.5	0.2	0.6	3.3	0.7	6.0	22	14.0
CY	6.5	-1.2	0.0	0.0	0.0	6.7	0.9	1.7	6.1	0.3	4.0	19	14.2
LV	8.7	1.7	3.5	3.6	8.2	0.9	1.3	1.2	0.3	0.6	0.6	21	18.1
LT	5.0	2.0	4.9	5.5	5.3	0.2	1.1	0.5	1.9	0.6	0.2	21	18.0
LU	6.8	-15.8	7.5	6.3	12.0	5.2	1.6	2.6	3.8	1.9	3.8	17	13.2
HU	10.8	4.1	3.9	5.5	6.6	2.8	1.3	0.4	2.5	0.1	1.3	27	21.6
MT	5.4	1.5	6.4	5.8	1.8	8.7	0.1	1.7	2.2	0.9	2.1	18	17.3
NL	6.2	4.5	4.8	5.9	13.4	3.8	0.4	0.8	2.2	1.4	1.1	21	16.0
AT	7.1	2.5	5.3	6.7	7.5	3.0	0.6	1.4	4.2	0.0	8.4	20	15.0
PL	3.0	3.6	4.2	4.3	6.9	12.2	1.3	0.5	1.7	1.9	5.1	23	13.6
PT	7.8	3.4	4.5	6.4	7.8	6.6	1.2	1.0	5.3	0.3	1.5	23	15.4
RO	8.3	-0.2	3.1	4.0	4.2	7.0	1.3	0.7	1.9	0.2	0.9	19	16.1
SI	7.2	2.9	5.3	6.2	4.7	5.2	1.2	0.5	1.9	1.0	1.4	22	16.5
SK	9.6	2.5	4.1	4.8	8.6	1.6	1.2	1.1	0.1	0.1	1.8	20	14.7
FI	9.9	3.3	4.3	6.5	9.9	2.7	0.9	0.9	1.5	0.1	3.4	24	19.0
SE	3.8	2.9	7.5	6.8	10.3	3.6	0.5	1.1	1.6	0.0	0.9	25	20.5
EU27	**7.6**	**2.8**	**5.0**	**6.5**	**8.6**	**4.9**	**0.6**	**0.8**	**2.3**	**0.6**	**2.8**	**21.5***	**16.6***

*Source: own elaboration, download underlying data. Note: * - simple average.*

Despite the measures introduced to alleviate the inflation crisis, the VAT policy gap remained stable in 2020. While the VAT rate gap increased by 1 percentage point, the VAT exemption gap decreased by a similar magnitude (see Figure 32). This is a consequence of the drop in expenditure on public services, and in particular healthcare, that remained elevated in 2020 and 2021. For this reason, within the analysed five-year time frame, the highest VAT policy gap was recorded in 2020, reaching 50.9% of the notional ideal revenue. Comparing 2022 to the pre-COVID period, the VAT policy gap was 0.3 percentage point higher than in 2018 and 0.6 pp higher than in 2019.

The actionable VAT policy gap increased in 2022 by 1.4 percentage points overall compared to 2021. It also remained approximately 1 pp above pre-COVID period (2018 and 2019). This was driven by the above-mentioned increase in the rate gap and by the increase in the actionable exemption gap of 0.4 percentage points. The non-actionable exemption gap dropped in 2022 by 1.6 percentage points (see Figure 32).

Figure 32: Change in the EU27 exemption (actionable and non-actionable parts) and rate gap (as % of notional ideal revenue, 2018–2022, stacked)



Source: own elaboration, download underlying data.

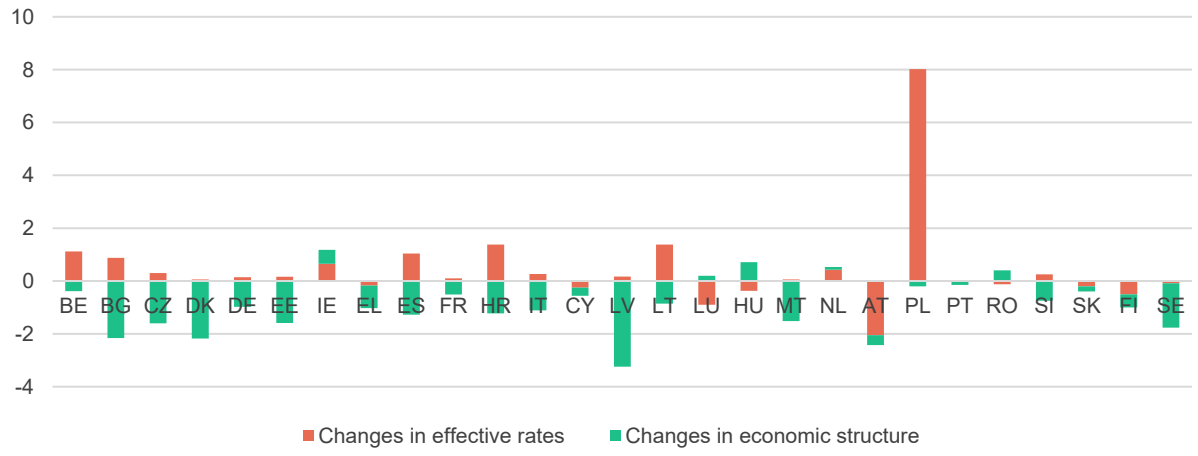
The shifts in the VAT policy gap and actionable VAT policy gap in 2022 can be further broken down into two basic components. The first element impacting the VTTL that could be distinguished is the structure of the tax base, involving the relative importance of different consumption components (household, NPISH, and government final consumption, GFCF, and intermediate consumption) as well as the composition of these components by major (2-digit CPA) categories of goods and services. The second component distinguished below are the shifts in parameters embedded in the model that are driven by statutory changes and changes in the consumption structure within the main categories of goods and services.[31]

[31] *Note: These components could not be decomposed at this stage.*

Such a decomposition shows that changes in the economic structure in 2022 were a factor driving the policy gap downwards in a majority of Member States (see Figure 33). Such a dependence, caused primarily by the decline in forgone revenue attributed to public services, was observed in 22 Member States, with the largest impact of -3.2 percentage points calculated for Latvia. Looking at the actionable VAT policy gap (Figure 34), the impact of changes in the economic structure was positive in nearly all Member States. This was primarily caused by the increase in the use of services (as hospitality) that was constrained in 2021 due to the COVID-19 pandemic and related restrictions.

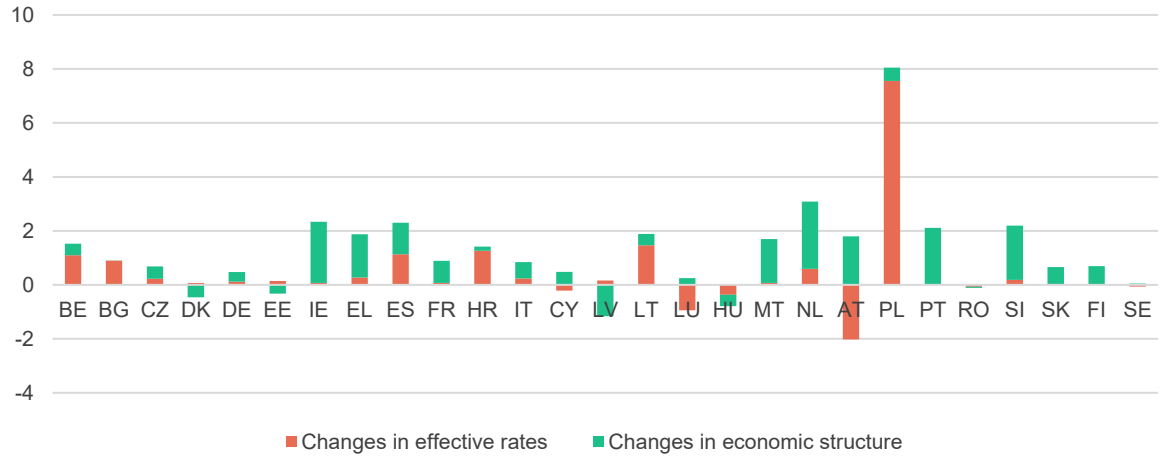
In the case of both the policy gap and actionable policy gap, the impact of changes in product-related effective rates varied significantly across Member States. The evolution of the VAT rate gap in Poland stands out in the graph. The introduction of reduced and zero rates on a broad group of products (such as foodstuffs and energy) led to an increase in both the VAT policy and VAT actionable policy gaps by approximately 8 percentage points. The relatively large impact of anti-inflation relief measures also contributed to policy gap increases in Belgium, Spain, Croatia, and Lithuania, among others.

Figure 33: Decomposition of change in the VAT policy gap (2022 vs. 2021, percentage points)



Source: own elaboration, download underlying data.

Figure 34: Decomposition of change in the actionable VAT policy gap (2022 vs. 2021, percentage points)



Source: own elaboration, download underlying data.

V. VAT compliance and policy gaps – individual country assessment

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

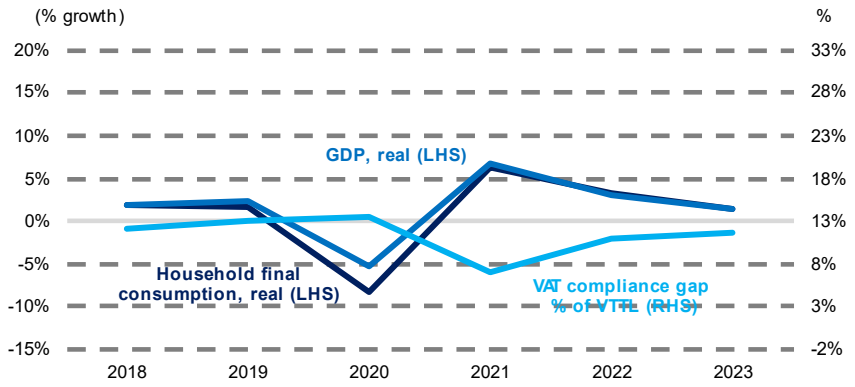
- Estimates based on somewhat outdated information or relatively large unexplained volatility of estimates.

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

Belgium

VAT revenue in Belgium grew by 5.3% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply in 2021 before rising again in 2022** (Figure 35). Despite this increase, the VAT compliance gap remained below the recent historic average corresponding with real GDP and household final consumption rebounding following the pandemic.

Figure 35: BE: Real GDP, household final consumption, and the VAT compliance gap (% growth / %, 2018-2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Belgian economy grew by roughly 2% annually between 2018 and 2019. However, in 2020 the pandemic had a large impact on the economy, leading to a 5.3% decline due to strict lockdowns and disruptions to economic activity. Recovery began in 2021, with real GDP growing by **6.8% in 2021 and 3.0% in 2022**, driven by **strong domestic demand and financial support** from EU recovery funds. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Belgium bounced back strongly following the pandemic, with GDP levels 1.2% above pre-pandemic levels by the end of 2021. In nominal terms, GDP grew by 9.1% in 2022, mainly due to increased inflation. Although growth was strong in 2022, the pace varied. Rapid growth in the first half of the year was driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Belgium experienced a marked increase in inflation in 2022, with rates reaching levels unseen for a long time, largely due to the impact of **Russia's war of aggression against Ukraine** on energy prices. To mitigate the impact of rising energy costs, the Belgian government implemented measures such as fuel subsidies, price caps and financial aid packages, as well as a reduction in the VAT rate on energy from 21 to 6% in March 2022. Despite these efforts, inflation rose to a record high of 10.3% in 2022, slightly above the EU27 average of 9.2%. Before then, inflation had been low in 2018–2020, with inflation at only 0.4% in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, rising inflation caused consumers' real disposable incomes to decline by 1.9%, leading them to dip into savings they had built up during the pandemic. Despite this, **real household final consumption increased by 3.2%**, driven by the lifting of restrictions, which supported growth in the VAT base. Taking the elevated rate of inflation into account, **this resulted in nominal growth of 13.3%**.

In 2022, consumers and businesses regained confidence and resumed postponed investments, triggering an increase in VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased robustly in 2022 by 9.1% and 5.1% respectively, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by 12.7% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Belgium's nominal household final consumption mirrored trends seen across the EU27, with growth varying across categories of products and services. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (42.9% growth) and on recreational and cultural goods and services (14.1% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 9.9% in nominal terms.

In 2022, the services sector exhibited **faster growth compared to the industrial sector,** with real GVA increasing by 4.1% from 2021, and reaching levels 6.2% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic. However, it rebounded strongly, with arrivals increasing by 153.5% in 2022. Despite such strong growth, levels remained below those recorded pre-pandemic. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector slowed to 0.7%** due to the ongoing energy crisis.

In Belgium, **e-commerce growth declined between 2019 and 2022**, with online sales falling from 32.6% to 27.7% of business turnover, and the share of businesses engaging in e-sales decreasing marginally from 30.5% to 30.2%. Moreover, online retail sales decreased from 15.1% to 10.2% over the same period. The decline in e-sales has the potential to increase non-compliance risks.

In 2022, **bankruptcy declarations in Belgium surged by 41.7%** as government support for businesses from the pandemic was phased out, leading to firms that had been sustained during the crisis filing for insolvency. Meanwhile, bankruptcy declarations remained much lower between 2020 and 2021, with declarations declining due to government support. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 9: BE: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	3.9%	2.4	Positive
Nominal household final consumption, restaurants & hotels	42.9%	17.5	Negative
Nominal household final consumption, custom services aggregate	30.1%	13.0	Negative
GDP services, real	4.1%	-3.2	Negative
GDP, real	3.0%	-3.8	Positive
Total tourism arrivals	153.5%	128.0	Negative
Bankruptcy declarations	41.7%	51.4	Negative
E-commerce, % of sectors	-	-1.2	Positive

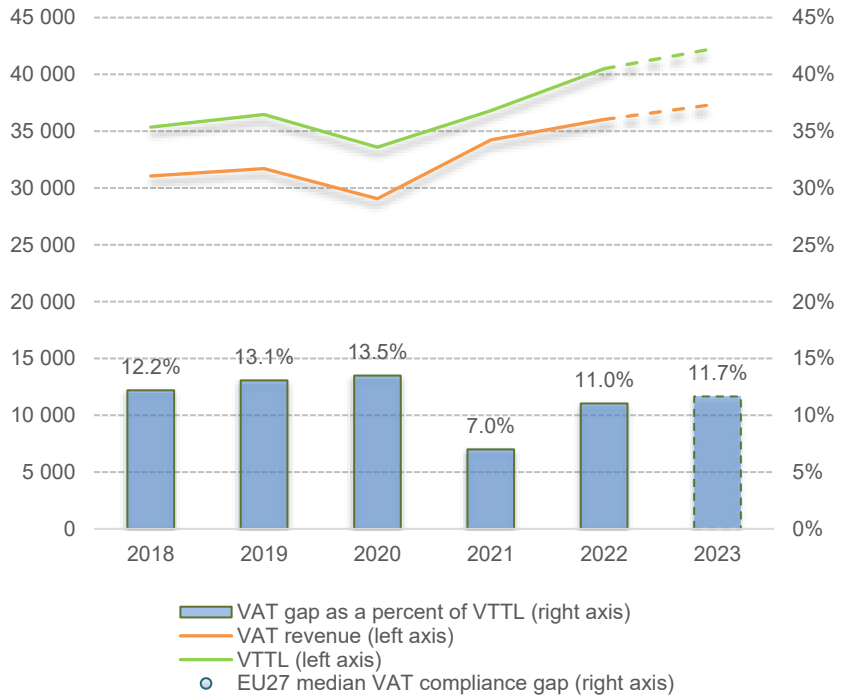
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat and Tourism Economics and Oxford Economics.

Table 10: BE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**35 364**	**36 468**	**33 590**	**36 809**	**40 501**	*42 334*
o/w liability on household final consumption	19 731	20 208	18 268	19 979	22 158	
o/w liability on gov. and NPISH final consumption	1 472	1 532	1 572	1 704	1 864	
o/w liability on intermediate consumption	7 815	8 215	7 664	8 464	9 203	
o/w liability on GFCF	5 653	5 769	5 541	6 103	6 573	
o/w net adjustments	693	744	545	559	702	
VAT revenue	**31 053**	**31 702**	**29 058**	**34 234**	**36 031**	*37 402*
VAT compliance gap	**4 311**	**4 766**	**4 532**	**2 575**	**4 469**	
VAT compliance gap (% of VTTL)	**12.2%**	**13.1%**	**13.5%**	**7.0%**	**11.0%**	*11.7%*
VAT compliance gap change since 2018					**-1.2 pp**	

Figure 36: BE: VAT compliance gap, VAT revenue, and VTTL[32]



Source: own calculation, download underlying data.

Highlights

- In 2022, the estimated VAT compliance gap increased by 4 percentage points year-over-year. However, the dip observed in 2021 may have been partially caused by the inability to fully account for late VAT payments in 2020 and 2021.
- The VAT compliance gap is expected to have remained broadly stable in 2023.

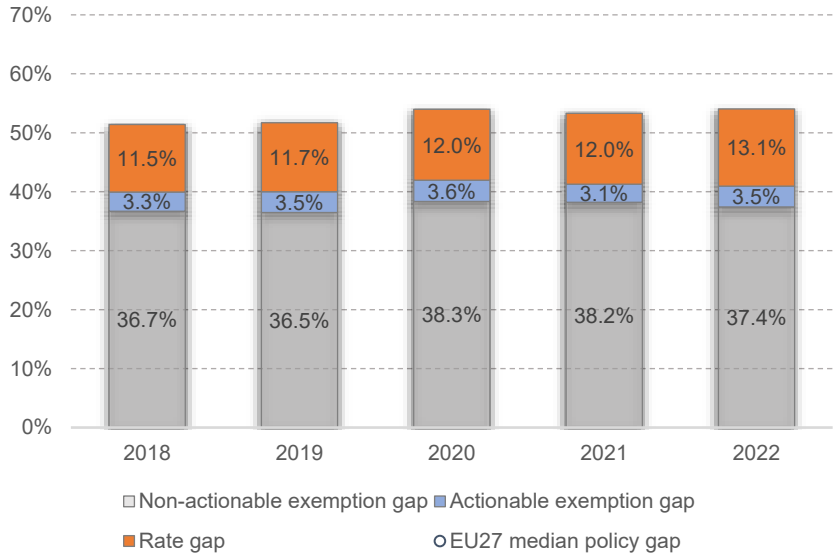
Assessed reliability of estimates:

[32] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 11: BE: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**37 411**	**39 023**	**39 410**	**42 026**	**47 633**
Exemption gap	**29 068**	**30 198**	**30 623**	**32 530**	**36 081**
o/w imputed rents	5 308	5 436	5 563	5 761	5 912
o/w public services	18 516	19 338	19 259	20 850	22 960
o/w financial services	*2 870*	*2 762*	*3 173*	*3 515*	*4 114*
Rate gap	**8 342**	**8 825**	**8 787**	**9 496**	**11 552**
o/w agricultural products, foodstuffs, beverages	4 273	4 416	4 600	4 723	4 942
o/w pharmaceuticals	797	845	881	921	987
o/w transport services	691	733	609	658	741
o/w accommodation and restaurant services	853	868	786	1 194	1 375
o/w utilities	121	124	126	132	1 474
o/w other	1 607	1 838	1 785	1 867	2 032
Actionable policy gap	**10 717**	**11 488**	**11 415**	**11 901**	**14 647**
C-efficiency (%)	**48.3%**	**47.7%**	**45.3%**	**49.5%**	**46.3%**
Statutory standard VAT rate			**21%**		
Actionable standard VAT rate	**15.1%**	**15.0%**	**14.7%**	**14.7%**	**14.5%**

Figure 37: BE: VAT policy gap, rate gap, and exemption gap



Highlights

- In 2022, Belgium introduced temporary rate cuts on electricity (effective from March), natural gas, and heat via heating networks (for residential contracts, effective from April).
- The policy gap in 2022 increased slightly, from 53.3% to 54.0%, driven by the impact of the introduced rate cuts on the rate gap.

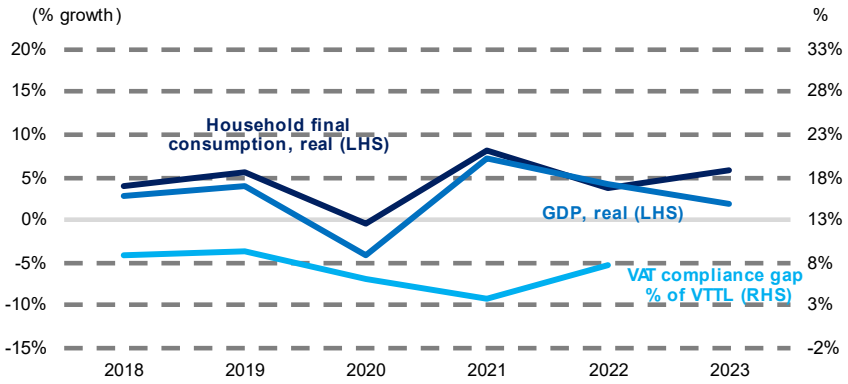
Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

Bulgaria

VAT revenue in Bulgaria grew by 16.7% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply between 2018 and 2021**, before increasing again in 2022 (Figure 38). Over this period, Bulgaria's compliance gap remained lower than levels seen pre-pandemic, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 38: BG: Real GDP, household final consumption, and the VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Bulgarian economy grew roughly 3.4% annually between 2018 and 2019. However, in 2020 the pandemic had a large impact on the economy, leading to a 4.0% decline, due to widespread lockdowns and reduced consumer and business activity. Recovery began in 2021, with real GDP growing by **7.1% in 2021 and 4.2% in 2022**, driven by **improved consumer confidence and government stimulus measures.** The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Bulgaria's recovery to pre-pandemic levels was quick relative to other Member States, with levels above those recorded pre-pandemic by the end of 2021. In nominal terms, GDP grew by 20.6% in 2022, primarily due to increased inflation. Despite strong growth in 2022, the pace varied, with growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year.

Bulgaria¸ which had roughly 90% of its gas supplied by Russia, **has been affected by the impact of Russia's war of aggression against Ukraine on energy prices**. Bulgaria was one of the first countries to see its gas cut off by Gazprom, forcing it to seek alternative supplies. To address the impact of rising energy costs, the Bulgarian government introduced measures such as wage subsidies, grants, tax deferrals, low-interest loans, and a reduction of the VAT rate on domestic energy from 20 to 9%. Despite these efforts, inflation rose to a decades-high of 13.0% in 2022, well above other Member States and the EU27 average of 9.2%. Previously, inflation had been low between 2018 and 2021, with inflation at only 1.2% in 2020 due to reduced demand. However, inflation began to rise in 2021 as the economy reopened.

In 2022, rising inflation caused growth in consumers' real disposable incomes to slow from 10.7% in 2021 to 2.3%, with consumers topping up their incomes by dipping into the savings they had built up during the pandemic. Despite this, **real household final consumption increased by 3.8%**, driven by the lifting of restrictions, which supported growth in the VAT base. Bearing in mind the rise in inflationary pressure, **this resulted in nominal growth of 20.2%**.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Bulgaria's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (58.8% growth) and transportation services (35.5% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 23.0% in nominal terms.

Unlike many in other Member States, at a broad level **the industrial sector exhibited the strongest growth in 2022 compared to the services sector**, with real GVA increasing by 11.0% from 2021, and reaching levels 7.4% above those recorded pre-pandemic. Bulgaria's strong performance in the industrial sector in 2022 went against the EU trend, and was driven by a combination of strategic investments, competitive advantages, the effective use of EU funds and a resilient export market. Meanwhile, the services sector grew by 4.1%, with levels reaching 10.9% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it rebounded strongly, with arrivals increasing by 51.5%, however it remained below pre-pandemic levels in 2022. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services.

In Bulgaria, **e-commerce expanded from 2018 to 2022**, with online sales rising from 5.2% to 6.9% of business turnover and the share of businesses engaging in e-sales growing from 8.1% to 14.9%. Additionally, online retail sales increased from 2.4% to 4.4% during the same period. An increase in e-sales reduces cash-in-hand transactions, which likely improves taxpayer compliance.

In 2022, **bankruptcy declarations in Bulgaria increased by 13.7%**, following a significant rise in 2021, as government support for businesses from the pandemic was phased out, leading firms that had been sustained during the crisis to file for insolvency. Meanwhile, bankruptcy levels had declined in 2020 due to the government supporting firms during strict lockdown measures. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 12: BG: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	27.7%	16.9	Positive
Nominal household final consumption, restaurants & hotels	58.8%	34.7	Negative
Nominal household final consumption, custom services aggregate	28.9%	-0.9	Negative
GDP services, real	4.1%	-4.7	Negative
GDP, real	4.2%	-2.9	Positive
Total tourism arrivals	51.5%	6.9	Negative
Bankruptcy declarations	13.7%	6.3	Negative
E-commerce, % of sectors	-	3.1	Positive

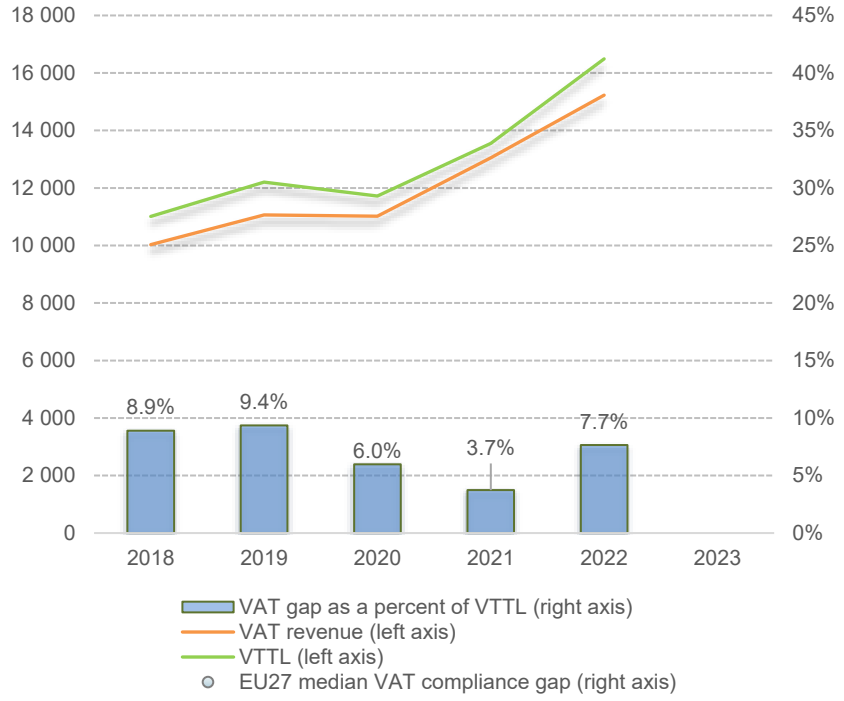
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 13: BG: VAT compliance gaps, VAT receipts, composition of VTTL (BGN million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**11 010**	**12 203**	**11 722**	**13 553**	**16 490**	*X*
o/w liability on household final consumption	7 935	8 652	8 199	9 673	11 791	
o/w liability on gov. and NPISH final consumption	341	383	450	530	562	
o/w liability on intermediate consumption	1 487	1 601	1 506	1 735	2 097	
o/w liability on GFCF	1 254	1 584	1 547	1 591	2 008	
o/w net adjustments	- 7	- 17	19	25	31	
VAT revenue	**10 030**	**11 061**	**11 021**	**13 048**	**15 228**	*X*
VAT compliance gap	**981**	**1 142**	**701**	**506**	**1 262**	
VAT compliance gap (% of VTTL)	**8.9%**	**9.4%**	**6.0%**	**3.7%**	**7.7%**	*X*
VAT compliance gap change since 2018					**-1.3 pp**	

Figure 39: BG: VAT compliance gap, VAT revenue, and VTTL



Source: own calculation, download underlying data.

Highlights

- In 2022, compared to 2021, the VAT compliance gap in Bulgaria increased by 3.9 percentage points and surpassed the levels observed during the COVID-19 pandemic.
- Although up-to-date data used for the compilation of underlying parameters was shared with the study team, the SUT tables for Bulgaria are very outdated (from 2014), resulting in low reliability of the estimates.
- The fast estimates for Bulgaria for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.

Assessed reliability of estimates:

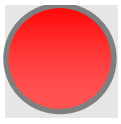
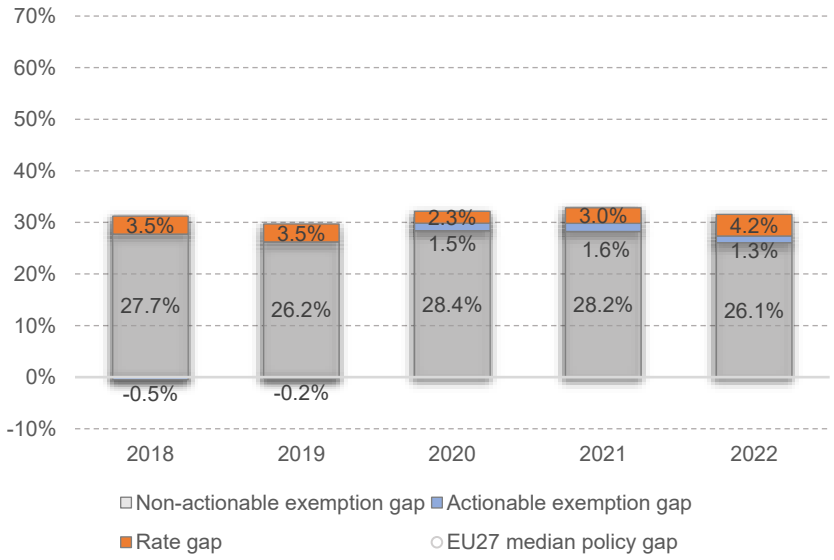


Table 14: BG: VAT policy gap and its components (BGN million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**4 886**	**5 114**	**5 550**	**6 622**	**7 599**
Exemption gap	4 335	4 509	5 155	6 015	6 594
o/w imputed rents	1 718	1 784	1 714	1 813	2 010
o/w public services	2 236	2 372	2 848	3 538	3 795
o/w financial services	*457*	*385*	*339*	*349*	*477*
Rate gap	**552**	**605**	**395**	**607**	**1 005**
o/w agricultural products, foodstuffs, beverages	0	0	1	0	5
o/w pharmaceuticals	0	0	0	0	0
o/w transport services	252	279	189	214	367
o/w accommodation and restaurant services	182	194	184	325	522
o/w utilities	0	0	0	0	32
o/w other	118	132	21	69	80
Actionable policy gap	**475**	**574**	**649**	**923**	**1 317**
C-efficiency (%)	**68.1%**	**69.3%**	**69.7%**	**70.2%**	**68.4%**
Statutory standard VAT rate			**20%**		
Actionable standard VAT rate	**19.6%**	**19.9%**	**19.7%**	**19.2%**	**19.2%**

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



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

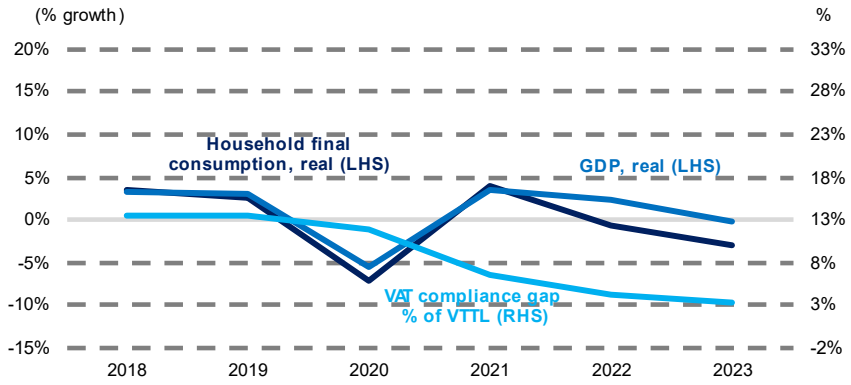
Highlights

- In response to high inflation rates, Bulgaria reduced the rates applicable to district heating and supplies of natural gas in mid-2022. Moreover, the temporary rate reductions implemented in 2020, among others for restaurants and tourist services, were still in place. Consequently, the rate gap increased by 1.2 percentage points.
- The policy gap dropped in 2022 to 31.5%, compared to 32.8% observed the year before.
- Both the policy gap and actionable policy gaps in Bulgaria are among the smallest in the EU. Due to the latter, the actionable standard VAT rate is very close to the statutory standard rate.

Czechia

VAT revenue in Czechia grew by 15.8% in 2022, with real GDP and investment also increasing robustly in 2021 and 2022, while household final consumption increased in 2021 but stagnated in 2022 due to high inflation and the energy crisis weighing on consumer confidence (Annex F). Meanwhile, **the VAT compliance gap fell sharply between 2019 and 2022** (Figure 41). Over this period, Czechia's VAT compliance rate remained lower in 2021 and 2022, with real GDP rebounding strongly following the pandemic.

Figure 41: CZ: Real GDP, household final consumption, and the VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Czech economy grew by roughly 3% annually between 2018 and 2019. However, in 2020 the pandemic had a large impact on the economy, leading to a 5.5% decline. Recovery began in 2021, with real GDP growing by **3.5% in 2021 and 2.4% in 2022**, **driven by the easing of restrictions, and solid domestic demand.** Meanwhile, due to supply chain disruption and high commodity prices, foreign trade dampened growth dynamics. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Nonetheless, Czechia's recovery to pre-pandemic levels was one of the slowest across Member States, only reaching 2019 levels by the end of 2022. In nominal terms, GDP grew by 11.1% in 2022, mainly due to high inflation. Despite robust growth in 2022, the **pace varied**, with strong growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Czechia has been profoundly affected by the impact of Russia's war of aggression against Ukraine on energy prices, with roughly 87% of its gas supply in 2021 imported from Russia. To mitigate the impact of rising energy costs, the Czech government implemented measures such as energy price caps, targeted support for vulnerable groups, tax adjustments and wage indexation after it temporarily waived VAT on electricity and gas in November and December 2021. Despite these efforts, inflation rose to a record high of 14.8% in 2022, well above the EU27 average of 9.2%. Previously, between 2018 and 2021, inflation had averaged 2.8% annually.

In 2022, rising inflation caused consumers' real disposable incomes to decline by 3.8%, with consumers dipping into the savings they had built up during the pandemic. Similarly, **real household final consumption decreased by 0.6%**, driven by several factors, primarily influenced by economic challenges and external pressures, which reduced support for growth in the VAT base. Taking into account the elevated rate of price inflation, **this resulted in nominal growth of 14.3%**.

In 2022, consumers and businesses continued to regain confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including those by non-profit institutions serving households, increased significantly in 2022 by 14.8% and 3.1% respectively, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by a remarkable 39.0% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **Czechia's nominal household final consumption followed a similar trend to the EU27**, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (56.7% growth) and on recreational and cultural goods and services (34.7% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 11.0% in nominal terms.

In 2022, the services sector exhibited **faster growth compared to the industrial sector,** with real GVA increasing by 3.7% from 2021, and reaching levels 4.7% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic, but it has started to recover, with arrivals increasing by 130.9% in 2022. Despite strong growth, levels remain significantly below those recorded pre-pandemic. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector slowed to 1.9%** due to the ongoing energy crisis, with levels below those recorded pre-pandemic.

In Czechia, **e-commerce growth declined between 2019 to 2022**, with online sales falling from 31.7% to 29.9% of business turnover, and the share of businesses engaging in e-sales dropping from 29.8% to 24.7%. Moreover, online retail sales decreased from 8.8% to 8.5% over the same period. The decline in e-sales has the potential to increase non-compliance risks.

Bankruptcy declarations increased in Czechia by 6.6% in 2022, a marked improvement from the surge of 11.9% in 2021, as government support for businesses from the pandemic was unwound, leading firms that had been sustained during the crisis to file for insolvency.

Table 15: CZ: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	14.8%	8.1	Positive
Nominal household final consumption, restaurants & hotels	56.7%	51.0	Negative
Nominal household final consumption, custom services aggregate	47.2%	37.7	Negative
GDP services, real	3.7%	-0.9	Negative
GDP, real	2.4%	-1.1	Positive
Total tourism arrivals	130.9%	133.4	Negative
Bankruptcy declarations	6.6%	-5.3	Negative
E-commerce, % of sectors	-	-0.8	Positive

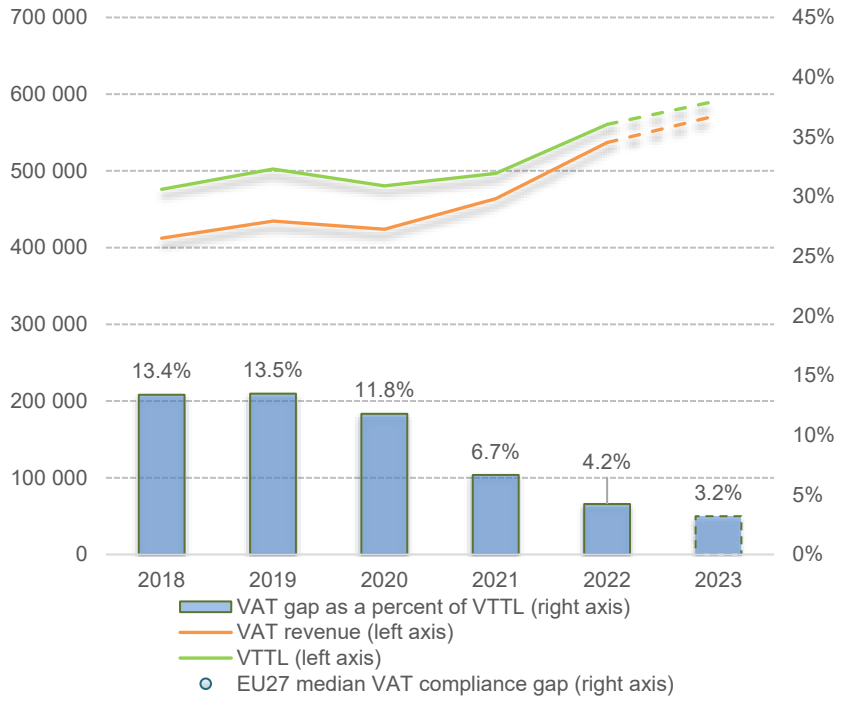
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 16: CZ: VAT compliance gaps, VAT receipts, composition of VTTL (CZK million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**476 003**	**502 294**	**480 474**	**496 788**	**560 641**	*591 721*
o/w liability on household final consumption	293 848	304 328	279 104	289 005	333 576	
o/w liability on gov. and NPISH final consumption	22 969	25 006	26 421	26 578	27 004	
o/w liability on intermediate consumption	89 927	95 387	95 885	99 503	111 831	
o/w liability on GFCF	71 452	79 506	81 872	84 456	89 941	
o/w net adjustments	-2 193	-1 933	-2 809	-2 754	-1 710	
VAT revenue	**412 271**	**434 627**	**423 868**	**463 678**	**536 937**	*572 745*
VAT compliance gap	**63 732**	**67 667**	**56 606**	**33 110**	**23 704**	
VAT compliance gap (percent of VTTL)	**13.4%**	**13.5%**	**11.8%**	**6.7%**	**4.2%**	*3.2%*
VAT compliance gap change since 2018					**-9.2 pp**	

Figure 42: CZ: VAT compliance gap, VAT revenue, and VTTL[33]



Source: own calculation, download underlying data.

Highlights

- In Czechia, the VAT compliance gap continued its downward trend, falling by a further 2.5 percentage points in 2022 compared to 2021. The stability of this trend suggests that there were no major issues (in contrast to many other Member States) with the recording of deferred VAT during 2020 and 2021.

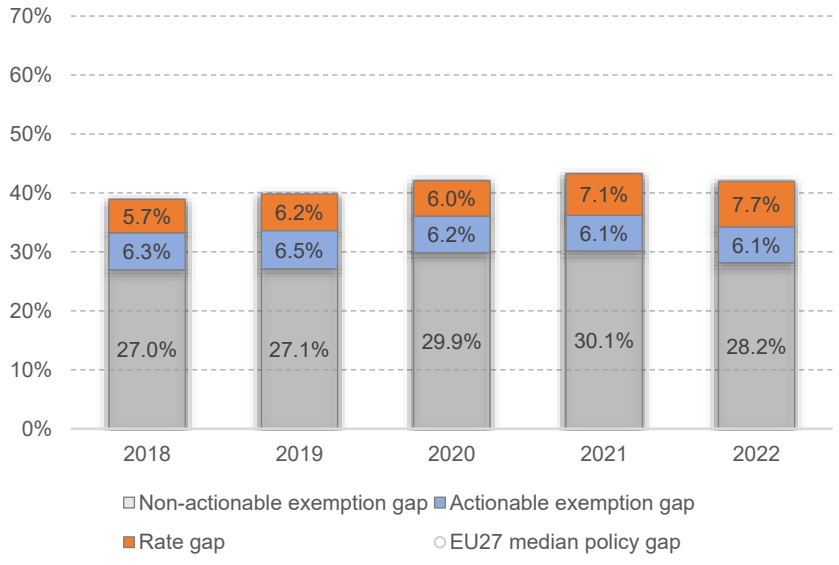
Assessed reliability of estimates:

[33] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 17: CZ: VAT policy gap and its components (CZK million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**303 198**	**332 252**	**348 706**	**379 193**	**405 853**
Exemption gap	**259 061**	**280 625**	**299 078**	**317 102**	**331 018**
o/w imputed rents	67 228	72 352	75 305	77 332	82 042
o/w public services	128 430	139 406	155 344	168 857	174 076
o/w financial services	*14 341*	*14 404*	*17 057*	*17 913*	*16 154*
Rate gap	**44 137**	**51 628**	**49 629**	**62 091**	**74 835**
o/w agricultural products, foodstuffs, beverages	20 259	21 002	21 773	22 653	25 095
o/w pharmaceuticals	3 899	4 252	4 443	4 644	6 980
o/w transport services	3 504	4 685	3 062	4 294	4 834
o/w accommodation and restaurant services	5 153	9 596	5 223	12 664	19 186
o/w utilities	3 729	3 575	5 083	5 811	6 015
o/w other	7 593	8 517	10 044	12 025	12 725
Actionable policy gap	**93 199**	**106 090**	**101 000**	**115 091**	**133 581**
C-efficiency (%)	**60.2%**	**59.7%**	**59.1%**	**61.1%**	**63.6%**
Statutory standard VAT rate			**21%**		
Actionable standard VAT rate	**17.4%**	**17.3%**	**17.3%**	**16.8%**	**16.6%**

Figure 43: CZ: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

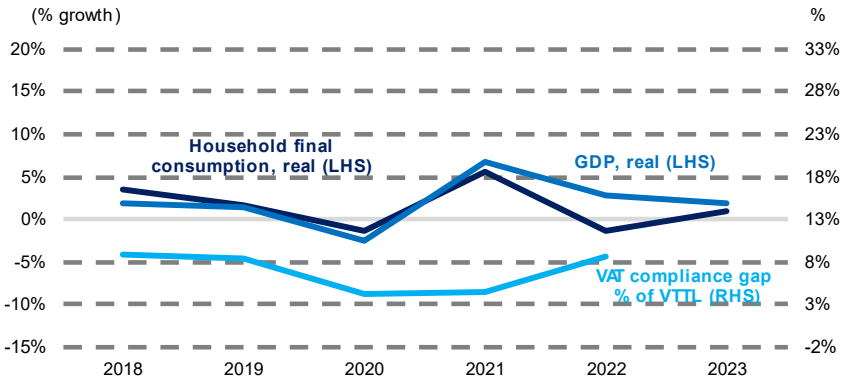
Highlights

- The VAT policy gap in Czechia dropped significantly between 2021 and 2022, from 43.3% to 42.0%. This decrease was primarily driven by a relative reduction in public expenditure.
- At the end of 2021, Czechia introduced a zero rate for the supply of gas and electricity (replacing the standard treatment). The measure was effective between November and December impacting the size of the VAT policy gap and its VAT rate gap component.

Denmark

VAT revenue in Denmark grew by 5.4% in 2022, with growth in GDP and investment also increasing robustly in 2021 and 2022, while household final consumption increased in 2021 but declined in 2022 due to high inflation and the energy crisis weighing on consumer confidence (Annex F). Meanwhile, **the VAT compliance gap fell sharply between 2018 and 2021** before increasing again in 2022 (Figure 44), despite real GDP rebounding following the pandemic.

Figure 44: DK: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Between 2018 and 2019, the Danish economy grew by roughly 2% annually. However, in 2020 the pandemic led to a 2.4% decline of GDP, with Denmark one of the first EU countries to implement a national lockdown to combat the spread of COVID-19. Recovery began in 2021, with real GDP growing by **6.8% in 2021 and 2.7% in 2022**, supported by strong domestic demand and a robust labour market. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Denmark recovered to pre-pandemic levels by the end of 2021. In nominal terms, GDP grew by 11% in 2022, mainly due to increased inflation. Despite strong growth in 2022, the **pace varied over the year** with rapid growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Denmark has been less affected by the impact of Russia's war of aggression against Ukraine on energy prices, with roughly only 4% of its total energy consumption from Russia, while continuing to invest in renewable energy. To mitigate the impact of rising energy costs, the Danish government implemented measures such as energy subsidies, targeted financial aid and investments in infrastructure and green projects. Despite these efforts, inflation rose to a record high of 8.5% in 2022, below the EU27 average of 9.2%. Before this, inflation had been low between 2018 and 2020, with inflation slowing to 0.4% in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, despite rising inflation, consumers' real disposable income continued to increase by 2.4% due to government support measures, wage growth, and a robust labour market. Despite this, **real household final consumption decreased by 1.4%**, driven by the combined effects of high inflation, energy costs and economic uncertainty which influenced consumer behaviour, reducing support for growth in the VAT base. Taking into account the elevated rate of inflation, **this resulted in nominal growth of 5.9%**.

In 2022, consumers and businesses continued to regain confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 6.0% and 12.7% respectively, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by 4.3% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **Denmark's nominal household final consumption followed a similar trend to the EU27**, with growth varying across product and service categories. Notably, there was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (35.2% growth) and on recreational and cultural goods and services (11.8% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 12.7% in nominal terms.

In 2022, unlike in most other Member States, the **industrial sector exhibited faster growth compared to the services sector,** with real GVA increasing by 9.1%, and reaching levels 14.9% above those recorded pre-pandemic. Meanwhile, growth in the services sector grew by 2.9%, with levels 6.7% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic, but it has started to recover, with arrivals increasing by 75.9% in 2022.

In Denmark, **e-commerce growth increased between 2018 and 2020**, with online sales increasing from 23.3% to 29.5% but then slowed to 24.0% of business turnover by 2022. Meanwhile, the share of businesses engaging in e-sales increased from 31.6% in 2018 to 38.5% in 2021, before dipping to 36.2% in 2022. Moreover, online retail sales increased from 7.7% in 2018 to 8.8% in 2022. An increase in e-sales has the potential to boost compliance.

In 2022, **bankruptcy declarations in Denmark improved and declined by 6.2%**. Bankruptcy declarations had risen by 51.3% in 2021, as government support for businesses from the pandemic was unwound, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 18: DK: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	5.8%	-0.2	Positive
Nominal household final consumption, restaurants & hotels	35.2%	17.4	Negative
Nominal household final consumption, custom services aggregate	28.3%	16.8	Negative
GDP services, real	2.9%	-3.3	Negative
GDP, real	2.7%	-4.1	Positive
Total tourism arrivals	75.9%	66.9	Negative
Bankruptcy declarations	-6.2%	-57.5	Negative
E-commerce, % of sectors	-	-2.3	Positive

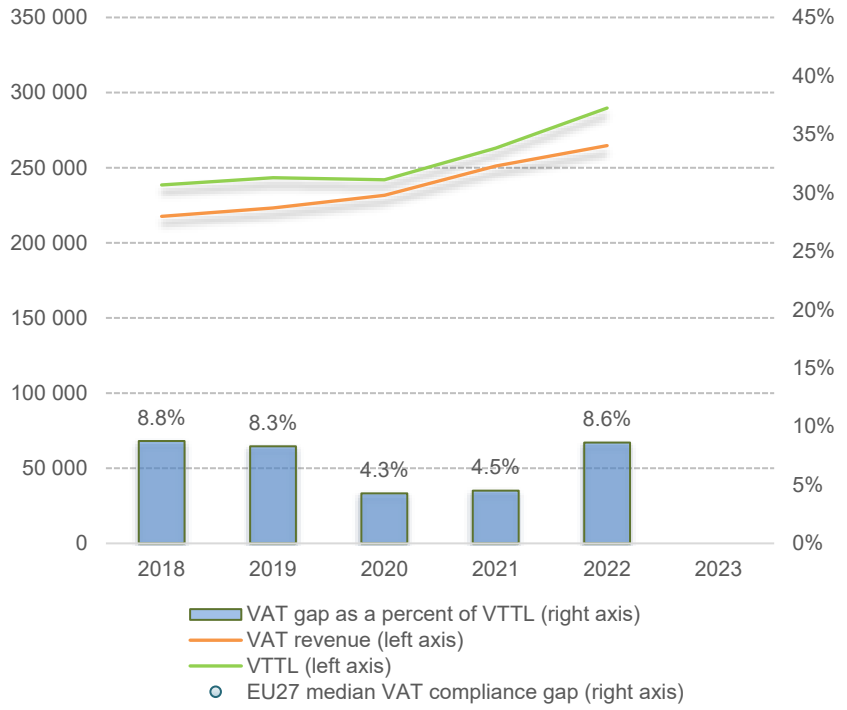
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 19: DK: VAT compliance gaps, VAT receipts, composition of VTTL (DKK million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**238 530**	**243 383**	**242 010**	**263 051**	**289 718**	*X*
o/w liability on household final consumption	140 388	143 367	138 873	150 669	165 286	
o/w liability on gov. and NPISH final consumption	5 301	5 475	5 641	6 053	6 112	
o/w liability on intermediate consumption	55 445	57 007	57 925	62 849	70 411	
o/w liability on GFCF	31 490	31 570	33 077	36 276	39 595	
o/w net adjustments	5 906	5 964	6 495	7 203	8 315	
VAT revenue	**217 627**	**223 180**	**231 650**	**251 166**	**264 725**	*X*
VAT compliance gap	**20 903**	**20 203**	**10 360**	**11 885**	**24 993**	
VAT compliance gap (% of VTTL)	**8.8%**	**8.3%**	**4.3%**	**4.5%**	**8.6%**	*X*
VAT compliance gap change since 2018					**-0.1 pp**	

Figure 45: DK: VAT compliance gap, VAT revenue, and VTTL[34]



Source: own calculation, download underlying data.

Highlights

- In 2022, the estimated VAT compliance gap increased by over 4 percentage points. As a result, the VAT compliance gap reached 8.6% of the VTTL, which is the level observed before the pandemic.
- The fast estimates for Denmark for 2023 are not published in this report due to uncertainty regarding the effective VAT rate calculation for this year.

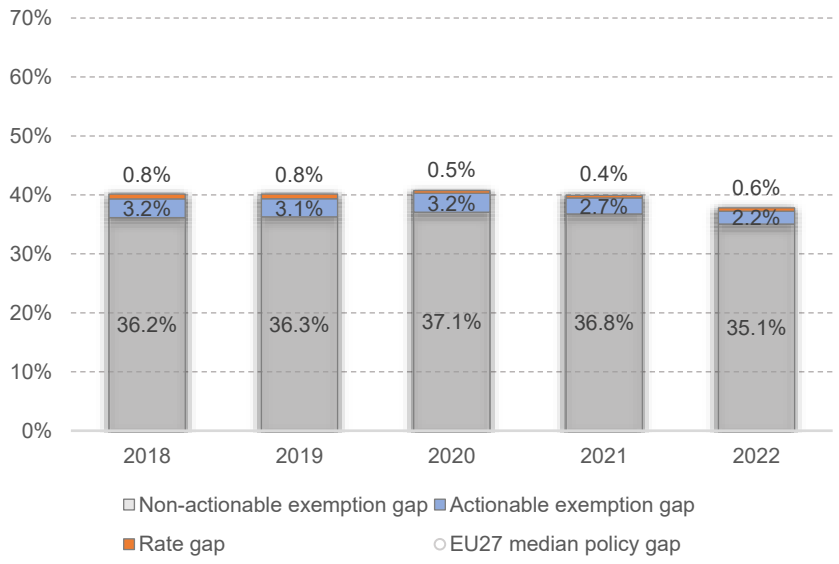
Assessed reliability of estimates:

[34] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 20: DK: VAT policy gap and its components (DKK million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**159 872**	**163 175**	**166 358**	**174 803**	**176 098**
Exemption gap	**156 701**	**159 973**	**164 421**	**172 909**	**173 414**
o/w imputed rents	29 577	30 481	31 497	32 278	33 852
o/w public services	95 642	98 340	100 542	107 204	106 700
o/w financial services	*18 814*	*18 709*	*19 314*	*21 557*	*22 725*
Rate gap	**3 171**	**3 203**	**1 937**	**1 894**	**2 684**
o/w agricultural products, foodstuffs, beverages	0	0	0	0	0
o/w pharmaceuticals	0	0	0	0	0
o/w transport services	3 171	3 203	1 937	1 894	2 684
o/w accommodation and restaurant services	0	0	0	0	0
o/w utilities	0	0	0	0	0
o/w other	0	0	0	0	0
Actionable policy gap	**15 838**	**15 645**	**15 005**	**13 764**	**12 820**
C-efficiency (%)	**62.0%**	**62.3%**	**65.2%**	**66.1%**	**65.8%**
Statutory standard VAT rate			**25%**		
Actionable standard VAT rate	**23.2%**	**23.2%**	**23.3%**	**23.4%**	**23.9%**

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



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

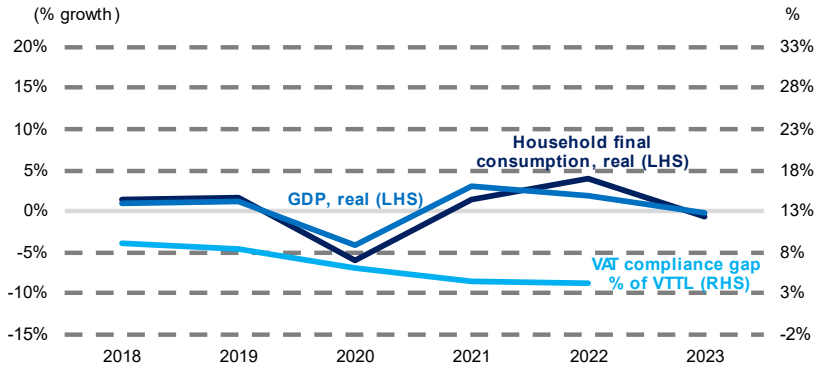
Highlights

- The VAT policy gap in Denmark in 2022 was 37.8% of the Notional Ideal Revenue. It has remained among the most stable and the lowest in EU-27 due to to very narrow application of reduced rates.
- Due to the low actionable policy gap, the actionable standard VAT rate was close to the statutory standard VAT rate.

Germany

VAT revenue in Germany grew by 10.1% in 2022, with key macroeconomic indicators such as GDP, household final consumption and investment also increasing in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply between 2018 and 2022** (Figure 47). Over this period, Germany's VAT compliance rate remained lower in 2021 and 2022, with real GDP and household final consumption rebounding following the pandemic.

Figure 47: DE: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the German economy grew roughly by 1% in both 2018 and 2019. However, **in 2020 the pandemic had a severe impact on the economy**, leading to a 4.2% decline. Recovery began in 2021, with real GDP growing by **3.1% in 2021 and 1.9% in 2022**, supported by strong industrial output and export performance. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Nonetheless, **Germany's recovery to pre-pandemic levels was slow relative to other Member States, only reaching 2019 levels by the end of 2022.** In nominal terms, GDP grew by 7.3% in 2022, mainly due to increased inflation.

Germany has been largely affected by the impact of Russia's war of aggression against Ukraine on energy supply and energy prices, with roughly 52% of its gas supply in 2021 imported from Russia. To mitigate the impact of rising energy costs, the German government implemented support measures for business and citizens alike and acquired an alternative energy supply. One support measure was to temporarily reduce the VAT rate on natural gas and district heating from 19% to 7% in 2022. Inflation rose to a high of 8.7% in 2022 (harmonised index of consumer prices), below the EU27 average of 9.2%. Before this, inflation had been low between 2018 and 2020, with inflation slowing to 0.3% in 2020 due to reduced demand. However, inflationary pressures already began to rise in 2021 as the economy reopened.

In 2022, **rising inflation caused consumers' real disposable incomes to decline by 0.5%**, a continuation of the trend observed in 2021. Despite this, real household final consumption exhibited surprising resilience, increasing by 3.9%, with growth driven by pent-up demand, improved consumer confidence as the economy gradually recovered from the pandemic, and a strong labour market. Taking into account the elevated rate of inflation, this resulted in nominal growth of 10.9%.

In 2022, consumers and businesses continued to regain confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 8.5% and 12.2%

respectively, contributing to higher VAT liabilities. Additionally, mostly non-deductible investment by financial institutions increased by 4.0% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **Germany's nominal household final consumption followed a similar trend to the EU27**, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (53.5% growth) and on recreational and cultural goods and services (15.6% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. Despite the strong growth in 2022, nominal household final consumption of services remained below pre-pandemic levels, a trend not seen across many Member States.

In 2022, **the services sector exhibited faster growth compared to the industrial sector**, with real GVA increasing by 3.0% from 2021, and reaching levels of 1.7% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it has started to recover, with arrivals increasing by 143.5% in 2022. Despite this, levels remained well below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **GVA in the industrial sector declined by 0.4%** due to the ongoing energy crisis, with levels below those recorded before the pandemic.

In Germany, **e-commerce growth increased between 2019 and 2021**, with online sales increasing from 15.1% to 19.1% but then slowed to 17.3% of business turnover in 2022. Meanwhile the share of businesses engaging in e-sales increased from 20.1% in 2019 to 22.4% in 2022. Moreover, enterprises' turnover from web sales increased from 5.0% in 2019 to 6.3% of business turnover from online sales in 2022. An increase in e-sales has the potential to boost compliance.

Bankruptcy declarations declined in Germany from 2018 to 2021. The slight decrease in 2018 and 2019 was due to favourable economic conditions, while government policies protected businesses during the pandemic in 2020 and 2021. However, once support measures were phased out, **bankruptcy declarations increased by 4.6% in 2022, albeit not reaching pre-pandemic levels**. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 21: DE: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	7.9%	4.7	Positive
Nominal household final consumption, restaurants & hotels	53.5%	49.8	Negative
Nominal household final consumption, custom services aggregate	33.4%	30.1	Negative
GDP services, real	3.0%	0.5	Negative
GDP, real	1.9%	-1.2	Positive
Total tourism arrivals	143.5%	149.6	Negative
Bankruptcy declarations	4.6%	16.3	Negative
E-commerce, % of sectors	-	0.7	Positive

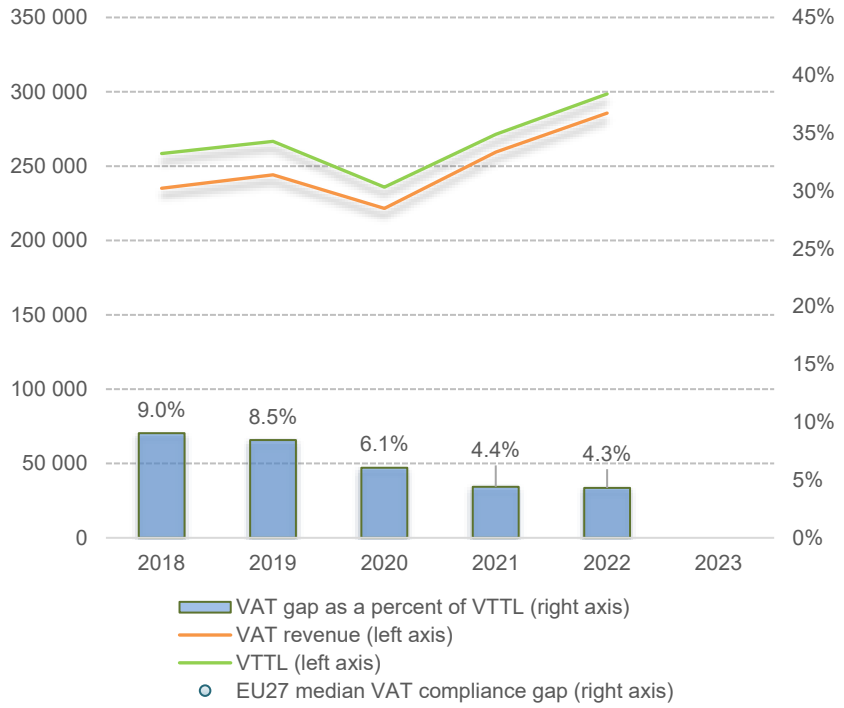
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 22: DE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**258 511**	**266 666**	**235 866**	**271 427**	**298 557**	*X*
o/w liability on household final consumption	153 562	157 605	132 962	151 156	168 180	
o/w liability on gov. and NPISH final consumption	7 199	7 648	7 443	8 640	9 052	
o/w liability on intermediate consumption	52 101	54 109	52 132	61 620	65 770	
o/w liability on GFCF	44 735	46 525	42 631	48 618	53 886	
o/w net adjustments	913	779	698	1 394	1 670	
VAT revenue	**235 130**	**244 111**	**221 562**	**259 435**	**285 665**	*X*
VAT compliance gap	**23 381**	**22 555**	**14 304**	**11 992**	**12 892**	
VAT compliance gap (% of VTTL)	**9.0%**	**8.5%**	**6.1%**	**4.4%**	**4.3%**	*X*
VAT compliance gap change since 2018					**-4.7 pp**	

Figure 48: DE: VAT compliance gap, VAT revenue, and VTTL[35]



Source: own calculation, download underlying data.

Highlights

- In 2022, the VAT compliance gap was estimated at 4.3%, remaining broadly unchanged compared to 2021. At the same time, the gap was substantially below the levels observed before the COVID-19 pandemic.
- The preliminary estimates for Germany for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.
- The estimates of the VTTL for 2021 were revised upwards compared to the 2023 Study due to the revision of national accounts for this period. Due to subsequent revisions of national account figures after the calculations for this report were completed, the estimates are likely to undergo significant adjustments in the future.

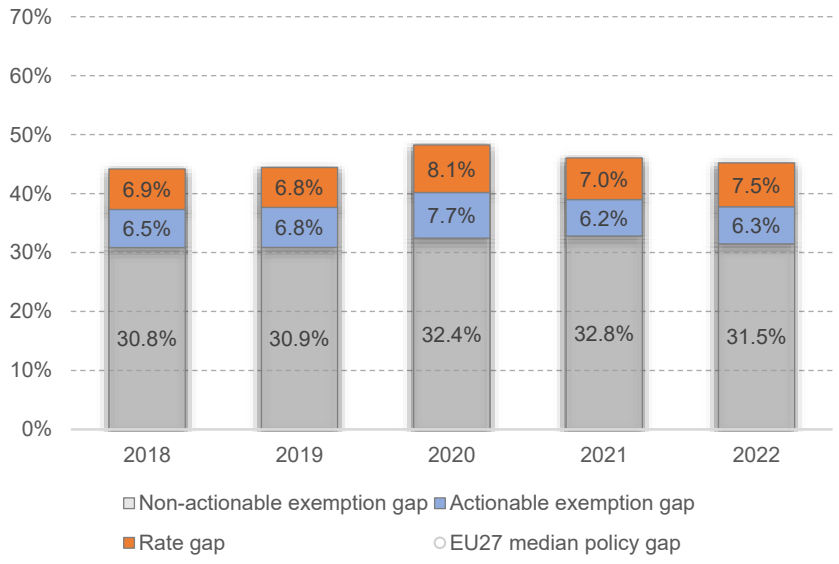
Assessed reliability of estimates:

[35] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 23: DE: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**204 523**	**213 129**	**219 928**	**231 650**	**246 346**
Exemption gap	**172 706**	**180 723**	**183 127**	**196 183**	**205 711**
o/w imputed rents	31 327	32 239	31 426	34 107	35 142
o/w public services	99 197	104 324	104 399	117 108	122 137
o/w financial services	*12 234*	*11 591*	*12 039*	*13 725*	*14 236*
Rate gap	**31 817**	**32 406**	**36 801**	**35 466**	**40 635**
o/w agricultural products, foodstuffs, beverages	19 762	20 700	25 029	22 632	23 838
o/w pharmaceuticals	613	636	647	777	806
o/w transport services	4 263	3 904	2 695	3 172	3 879
o/w accommodation and restaurant services	2 054	2 303	3 664	3 929	6 032
o/w utilities	852	863	841	891	1 542
o/w other	4 272	4 000	3 924	4 065	4 538
Actionable policy gap	**61 764**	**64 975**	**72 064**	**66 710**	**74 831**
C-efficiency (%)	**57.6%**	**57.7%**	**57.2%**	**59.0%**	**60.3%**
Statutory standard VAT rate (weighted)	**19%**	**19%**	**17.5%**	**19%**	**19%**
Actionable standard VAT rate	**15.2%**	**15.1%**	**13.5%**	**14.9%**	**14.8%**

Figure 49: DE: VAT policy gap, rate gap, and exemption gap



Highlights

- A temporary reduced rate (from 19% to 7%) was introduced for the supply of natural gas via the natural gas network and for the supply of district heating. This measure was in place between October 2022 and March 2023.
- This has led to an increase in the VAT rate gap. At the same time, the exemption gap has declined in 2022.

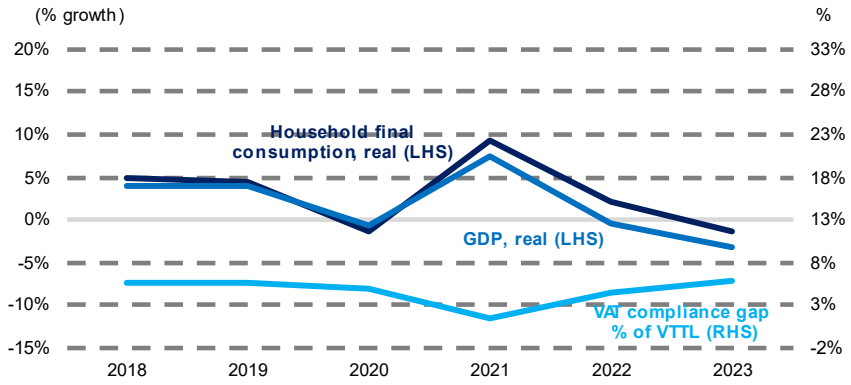
Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

Estonia

VAT revenue in Estonia grew by 16.2% in 2022, driven by increased household final consumption. While GDP and investment grew robustly in 2021 due to pandemic recovery, they contracted in 2022 due to economic uncertainty (Annex F). Meanwhile, **the VAT compliance gap fell sharply between 2018 and 2021**, before increasing in 2022 (Figure 50). Over this period, Estonia's VAT compliance rate remained lower in 2021 and 2022, with real household final consumption rebounding following the pandemic.

Figure 50: EE: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Estonian economy grew roughly 4% annually between 2018 and 2019. However, in 2020 the pandemic led to a 0.7% contraction, one of the smallest declines across Member States, due to its strong digital infrastructure, diversified economy, effective government response and robust export sector. A marked recovery began in 2021, with real GDP growing by 7.4%, with robust GDP growth correlated with strong growth in the VAT base. However, the economy then contracted by 0.5% in 2022 driven by high inflation, an energy crisis, a reduction in consumer confidence and weakening external demand. Nonetheless, **Estonia's recovery to pre-pandemic levels was one of the quickest, with levels back to 2019 levels by the end of 2021.** In nominal terms, GDP grew by 15.6% in 2022, mainly due to increased inflation. In 2022, real GDP growth declined, but the pace varied with robust growth in Q1 driven by the ongoing recovery, followed by negative annual growth for the remainder of 2022 due to rising inflation.

Like other Baltic countries, Estonia has been profoundly affected by the impact of Russia's war of aggression against Ukraine on energy prices, with roughly 39% of its oil products imported from Russia in 2021. To mitigate the impact of rising energy costs, the Estonian government implemented energy price subsidies, temporary VAT reductions on energy, business support programmes and energy efficiency programmes. Despite these efforts, inflation rose to a high of 19.4% in 2022, the highest rate across all Member States. Before this, inflation had been low between 2018 and 2020, declining by 0.6% in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, **high inflation caused consumers' real disposable incomes to decline by 5.8%**. During this period, consumers used the savings they had accumulated during the pandemic. Despite this, real household final consumption increased by 2.1%, due to strong employment and wage growth. Taking into account the elevated rate of inflation, this resulted in nominal growth of 19.3%.

In 2022, consumers and businesses continued to regain confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 5.2% and 20.5% respectively, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by 27.7% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **Estonia's nominal household final consumption followed a similar trend to the EU27**, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (52.5% growth) and on transportation services (31.8% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 21.7% in nominal terms.

Hospitality was one of the hardest hit sectors by the pandemic. It started to recover in 2022, but from a low base, with arrivals increasing by 166.9%. Despite this, levels had only recovered 57.3% of those recorded pre-pandemic. As hospitality is a services sector it has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **growth in the industrial sector declined by 5.3%** due to the ongoing energy crisis, with levels retreating to below those recorded pre-pandemic after recovering in 2021.

In Estonia, **e-commerce growth has mostly increased between 2019 and 2022**, with online sales increasing from 13.9% to 15.8% of business turnover in 2022. The share of businesses engaging in e-sales increased from 21.1% in 2019 to 22.6% in 2022. Moreover, online retail sales increased from 5.0% in 2019 to 7.1% in 2022. An increase in e-sales has the potential to boost compliance.

Bankruptcy trends in Estonia diverged from the broader EU27 pattern. While Bankruptcy declarations rose in 2019 and 2020, they declined in 2021 and 2022. This divergence is attributed to Estonia's unique economic trajectory during and after the pandemic, along with specific structural factors. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 24: EE: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	17.7%	13.0	Positive
Nominal household final consumption, restaurants & hotels	52.5%	41.5	Negative
Nominal household final consumption, custom services aggregate	36.9%	21.5	Negative
GDP, real	-0.5%	-7.8	Positive
Total tourism arrivals	166.9%	189.7	Negative
Bankruptcy declarations	-8.8%	23.3	Negative
E-commerce, % of sectors	-	0.0	Positive

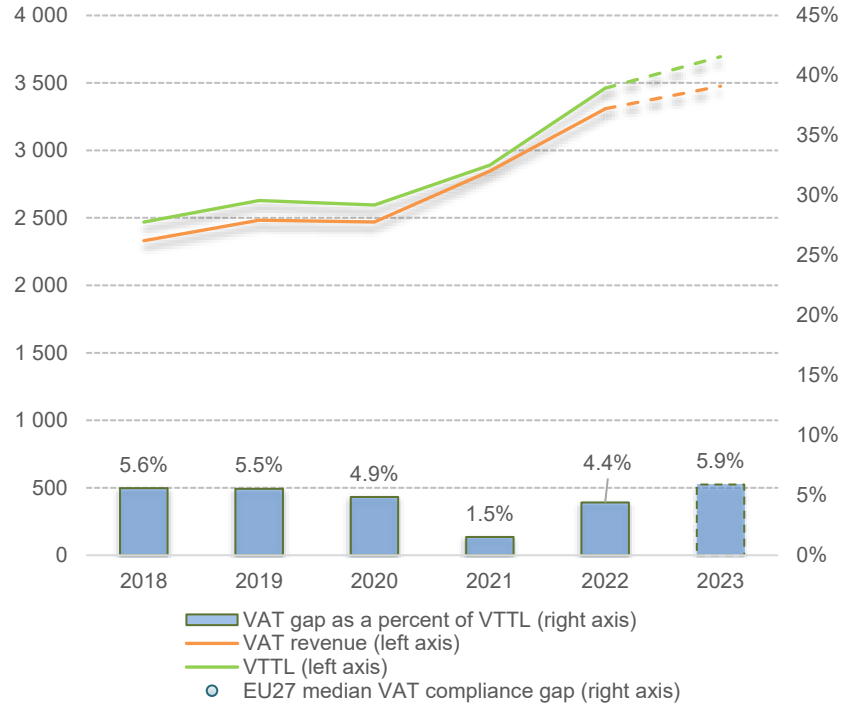
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 25: EE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**2 469**	**2 628**	**2 595**	**2 891**	**3 461**	*3 694*
o/w liability on household final consumption	1 628	1 715	1 658	1 859	2 269	
o/w liability on gov. and NPISH final consumption	76	86	87	96	107	
o/w liability on intermediate consumption	344	380	364	409	489	
o/w liability on GFCF	420	444	489	528	596	
o/w net adjustments	2	3	- 2	0	1	
VAT revenue	**2 331**	**2 483**	**2 469**	**2 847**	**3 309**	*3 476*
VAT compliance gap	**138**	**146**	**126**	**44**	**152**	
VAT compliance gap (% of VTTL)	**5.6%**	**5.5%**	**4.9%**	**1.5%**	**4.4%**	*5.9%*
VAT compliance gap change since 2018					**-1.2 pp**	

Figure 51: EE: VAT compliance gap, VAT revenue, and VTTL[36]



Source: own calculation, download underlying data.

Highlights

- In 2022, the VAT compliance gap increased by approximately 3 percentage points, reaching 4.4% of the VTTL. The VAT compliance gap is expected to have increased further in 2023.
- With the exception of 2021, the VAT compliance gap remained stable, fluctuating between 4.4% and 5.9%.

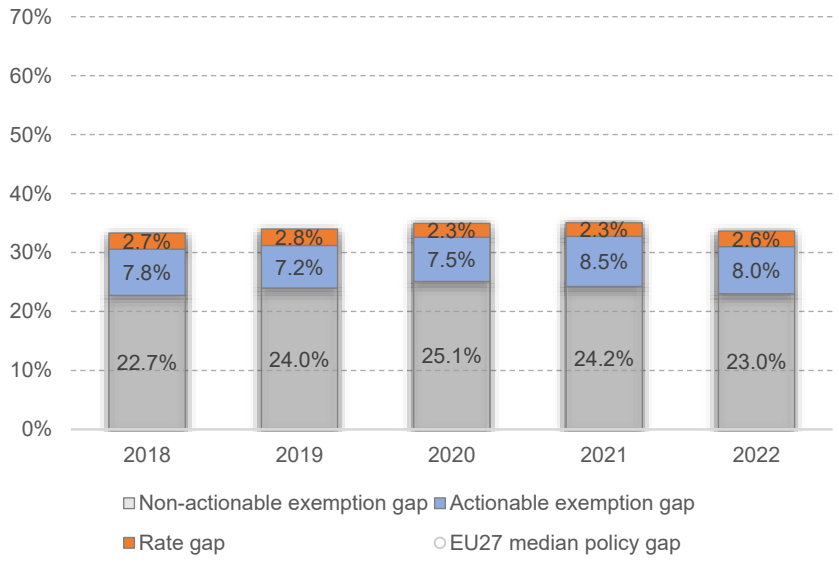
Assessed reliability of estimates:

[36] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 26: EE: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**1 232**	**1 351**	**1 394**	**1 561**	**1 754**
Exemption gap	**1 132**	**1 241**	**1 301**	**1 457**	**1 617**
o/w imputed rents	242	268	268	283	338
o/w public services	516	590	627	696	760
o/w financial services	*84*	*96*	*106*	*101*	*101*
Rate gap	**100**	**110**	**93**	**104**	**137**
o/w agricultural products, foodstuffs, beverages	3	3	3	3	4
o/w pharmaceuticals	33	37	39	42	46
o/w transport services	26	29	16	18	25
o/w accommodation and restaurant services	26	28	19	21	32
o/w utilities	0	0	0	0	0
o/w other	12	14	17	19	30
Actionable policy gap	**391**	**397**	**394**	**482**	**555**
C-efficiency (%)	**73.1%**	**72.4%**	**73.0%**	**75.0%**	**73.9%**
Statutory standard VAT rate			**20%**		
Actionable standard VAT rate	**18.5%**	**18.4%**	**18.6%**	**18.2%**	**18.1%**

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



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

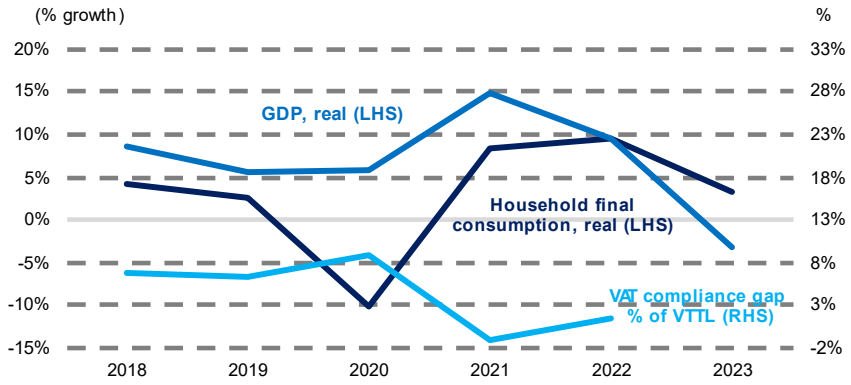
Highlights

- The VAT policy gap dropped to 33.6% in 2022, primarily due to a decrease in public expenditure on healthcare.
- C-efficiency in Estonia in 2022 was the highest in the EU, with VAT receipts accounting for almost 75% of the theoretical VAT base.
- Due to low actionable policy gap, the actionable standard VAT rate was close to the statutory standard VAT rate.

Ireland

VAT revenue in Ireland grew by 12.6% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing strongly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap rapidly increased from 2019 to 2020.** This trend however has since reversed between 2021 and 2022 (Figure 53).[37] Over this period, Ireland's VAT compliance rate remained lower in 2021, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 53: IE: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Irish economy grew on average 7% annually between 2018 and 2019. Unlike other Member States, **the Irish economy continued to grow during the pandemic** with growth of 5.8% recorded in 2020. The strong growth was driven by its solid multinational sector presence, particularly in technology and pharmaceuticals, robust digital economy, effective government support measures, low interest rates and a favourable tax economy. The economy continued to grow strongly in 2021 and 2022 with GDP growth of 14.7% and 9.6% respectively. However, the robust growth in GDP has not always correlated with strong growth in the VAT base as seen in 2020. In nominal terms, GDP grew by 16.8% in 2022, supported by strong real growth and enhanced by increased inflation driving up prices.

Ireland has been less affected by the impact of Russia's war of aggression against Ukraine on energy prices, as it does not import any oil or gas directly from Russia. Nonetheless, in 2022 the Irish government implemented a comprehensive set of measures aimed at reducing financial pressures on households and businesses. These included direct financial support, social welfare increases, public transport fare reductions, tax relief and a reduction in VAT for gas and electricity from 13.5% to 9% in 2022. Despite the support measures in place, inflation rose to a high of 8.1% in 2022 but was below the EU27 average of 9.2%. Before this, inflation had been low between 2018 and 2020, with inflation declining in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, **rising inflation caused growth in consumers' real disposable incomes to slow to 0.6%**. During this time, consumers dipped into the savings they had built up during the pandemic. Despite this,

[37] *The interpretation of changes in VAT compliance in Ireland requires caution due to problems with the accuracy of the estimates.*

real household final consumption exhibited resilience, increasing by 9.6%, with growth driven by strong employment and wage growth. Taking into account the elevated rate of inflation, this resulted in nominal growth of 16.7%.

In 2022, consumers and businesses continued to regain confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 19.2% and 50.9% respectively, contributing to higher VAT liabilities.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **Ireland's nominal household final consumption followed a similar trend to the EU27**, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (34.6% growth) and on recreational and cultural goods and services (29.4% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**.

In 2022, **the industry sector exhibited faster growth compared to the services sector**, with real GVA increasing by 18.7%, and reaching levels 78.6% above those recorded pre-pandemic due to the strong presence of multinationals, especially for the pharmaceutical and technology sectors. Meanwhile, the services sector also grew strongly in 2022, with GVA increasing by 6.5%, and reaching levels 16.7% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic, but it has started to recover, with arrivals increasing by 186.3% in 2022. Despite this, growth was from such a low base that by 2022 levels had only recovered 78.0% of those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services.

In Ireland, **e-commerce growth increased in 2020**, with online sales increasing from 34.1% in 2019 to 44.0% in 2020 of business turnover, but then growth declined to 33.1% by 2022. In contrast, the share of businesses engaging in e-sales increased from 35.1% in 2018 to 42.5% in 2022. Online retail sales in the meantime increased from 13.9% in 2019 to 20.1 in 2020, before slowing to 13.8% by 2022. A decrease in e-sales has the potential to increase taxpayer compliance.

Table 27: IE: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	6.7%	4.4	Positive
Nominal household final consumption, restaurants & hotels	34.6%	-9.5	Negative
Nominal household final consumption, custom services aggregate	33.3%	2.6	Negative
GDP services, real	6.5%	-2.4	Negative
GDP, real	9.6%	-5.1	Positive
Total tourism arrivals	186.3%	162.0	Negative
E-commerce, % of sectors	-	2.3	Positive

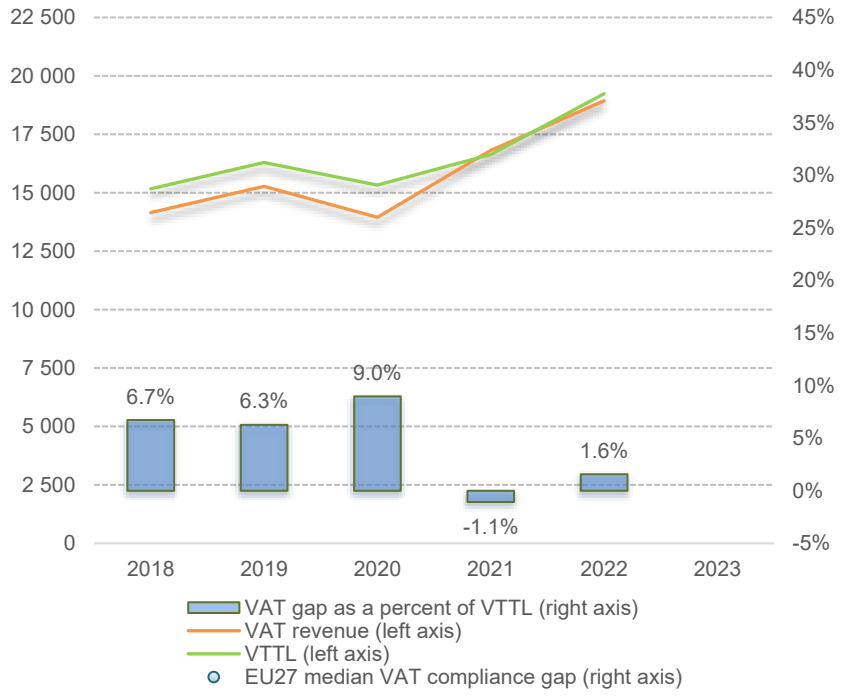
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 28: IE: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**15 168**	**16 292**	**15 326**	**16 637**	**19 238**	*X*
o/w liability on household final consumption	8 014	8 612	7 947	8 875	10 194	
o/w liability on gov. and NPISH final consumption	667	727	811	883	974	
o/w liability on intermediate consumption	4 121	4 504	4 309	4 582	5 156	
o/w liability on GFCF	2 073	2 113	2 083	2 099	2 722	
o/w net adjustments	293	336	176	198	192	
VAT revenue	**14 149**	**15 271**	**13 950**	**16 816**	**18 936**	*X*
VAT compliance gap	**1 020**	**1 021**	**1 376**	**- 179**	**302**	
VAT compliance gap (% of VTTL)	**6.7%**	**6.3%**	**9.0%**	**-1.1%**	**1.6%**	*X*
VAT compliance gap change since 2018					**-5.2 pp**	

Figure 54: IE: VAT compliance gap, VAT revenue, and VTTL[38]



Source: own calculation, download underlying data.

Highlights

- As the information used to estimate model parameters is partially outdated and the estimates for 2021 are negative, there is uncertainty around the estimates for Ireland. The estimates for Ireland use data from both Eurostat and the Central Statistics Office (CSO).
- The 2018-2020 use tables (published annually by the CSO) have been updated by rescaling each column separately to align with the latest National Accounts aggregates. The 2021 and 2022 supply and use tables (SUT) are forecasted in a similar manner based on the 2020 use table structure.
- The preliminary estimates for Ireland for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.

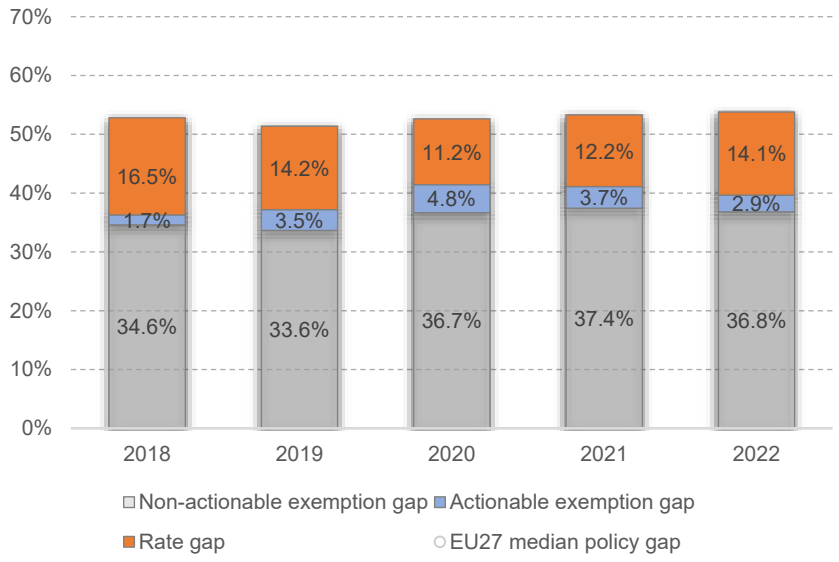
Assessed reliability of estimates:

[38] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 29: IE: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**16 984**	**17 209**	**17 030**	**18 984**	**22 408**
Exemption gap	**11 665**	**12 460**	**13 412**	**14 644**	**16 525**
o/w imputed rents	3 241	3 622	3 522	4 071	4 946
o/w public services	7 020	7 451	7 100	7 927	8 824
o/w financial services	*869*	*199*	*1 246*	*1 334*	*1 560*
Rate gap	**5 319**	**4 749**	**3 619**	**4 340**	**5 884**
o/w agricultural products, foodstuffs, beverages	888	690	756	1 013	1 463
o/w pharmaceuticals	1 215	1 024	777	877	978
o/w transport services	1 090	1 098	635	713	825
o/w accommodation and restaurant services	856	569	305	405	678
o/w utilities	221	312	290	334	464
o/w other	1 049	1 055	855	999	1 475
Actionable policy gap	**5 854**	**5 937**	**5 163**	**5 652**	**7 080**
C-efficiency (%)	**49.2%**	**50.5%**	**47.9%**	**51.6%**	**50.4%**
Statutory standard VAT rate (weighted)	**23%**	**23%**	**22.3%**	**22.7%**	**23%**
Actionable standard VAT rate	**15.3%**	**15.3%**	**16.3%**	**16.0%**	**15.7%**

Figure 55: IE: VAT policy gap, rate gap, and exemption gap



Highlights

- In May 2022, Ireland reduced the VAT rate applicable to the supply of electricity and the supply of gas used for domestic or industrial heating or lighting from 13.5% to 9%. As a result of these changes, the VAT rate gap increased by about 2 percentage point.
- Due to a parallel decrease in the non-actionable VAT exemption gap, the VAT policy gap remained stable.

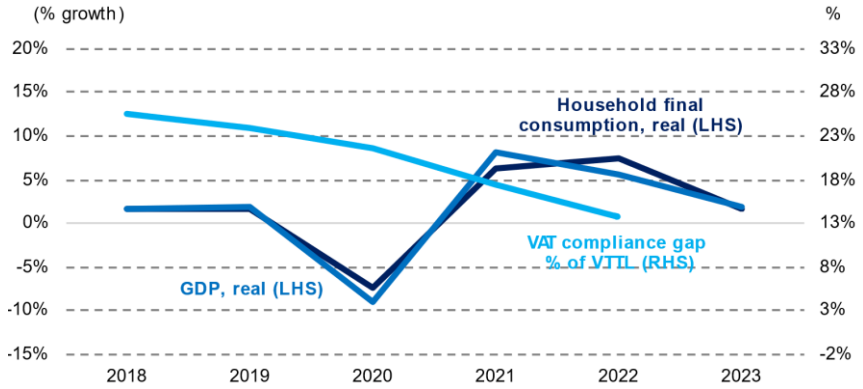
Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

Greece

VAT revenue in Greece grew by 22.8% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing strongly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap decreased from 2018 to 2022** (Figure 56). Over this period, Greece's VAT compliance ratio remained lower in 2021 and 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 56: EL: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Greek economy grew by an average of 2% annually betweeOn 2018 and 2019. However, in 2020 **the pandemic led to a large 9.0% contraction**, one of the largest declines across Member States, **driven by the strong reliance on tourism and pre-existing economic vulnerabilities**. Despite this, a marked recovery began in 2021, with real GDP growing by 8.1% in 2021 and 5.7% in 2022, driven by the recovery of the tourism sector, government support measures and domestic demand. The robust GDP growth correlated with strong growth in the VAT base. Nonetheless, Greece's recovery to pre-pandemic levels took time, with levels returning by the end of 2022. In nominal terms, GDP grew by 13.4% in 2022, mainly due to increased inflation affecting prices. Despite strong growth in 2022, the pace varied, with rapid growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Greece was quite reliant on Russian energy, particularly natural gas. However, due to the ongoing war in Ukraine and sanctions imposed on Russia, Greece has made strides in reducing its dependence. Despite this, Greece has been **profoundly affected by the impact of Russia's war of aggression against Ukraine on energy prices**. To mitigate the impact of rising energy costs, the Greek government implemented energy subsidies, tax relief, a reduced VAT rate on basic goods which has decreased VAT collections. Despite these efforts, inflation rose to a high of 9.3% in 2022, in line with the EU27 average of 9.2%. Before this, inflation had been low between 2016 and 2021, with inflation declining by 1.3% in 2020 due to reduced demand.

In 2022, **rising inflation caused growth in consumers' real disposable incomes to slow to 1.1%**. During this time, consumers dipped into the savings they had built up during the pandemic. Despite this, real household final consumption exhibited resilience, increasing by 7.5%, driven by wage support programmes still in place, the tourism recovery and pent-up demand. Taking into account the elevated rate of inflation, this resulted in nominal growth of 14.2%.

In 2022, consumers and businesses continued to regain confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 10.2% and 28.9% respectively, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by 17.4% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, **Greece's nominal household final consumption followed a similar trend to the EU27**, with growth varying across product and service categories. There was substantial growth in the services sector in 2022, with increased spending on **recreational goods and services (43.6% growth) and on restaurants and hotels (40.8% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 2.4% in nominal terms.

At a broad level, **the services sector exhibited faster growth in 2022 than industry**, with real GVA increasing by 6.0% from 2021, and levels 0.9% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic, but it has been recovering, with arrivals increasing by 96.0%. Despite the strong growth, levels remained below pre-pandemic levels in 2022. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **growth in the industrial sector declined by 4.9%** due to the ongoing energy crisis, but levels remain above those recorded pre-pandemic.

In Greece, **e-commerce expanded from 2018 to 2022**, with online sales rising from 3.8% to 6.9% of business turnover and the share of businesses engaging in e-sales growing from 11.8% to 20.4% in 2021, before slowing to 17.9% in 2022. Additionally, online retail sales increased from 3.4% to 5.2% during the same period. An increase in e-sales reduces cash-in-hand transactions and improves VAT compliance through better auditing.

Table 30: EL: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	8.1%	5.9	Positive
Nominal household final consumption, restaurants & hotels	40.8%	-6.1	Negative
Nominal household final consumption, custom services aggregate	39.0%	5.4	Negative
GDP services, real	6.0%	-1.3	Negative
GDP, real	5.7%	-2.4	Positive
Total tourism arrivals	96.0%	-9.9	Negative
Bankruptcy declarations	-70.0%	-	Negative
E-commerce, % of sectors	-	-2.5	Positive

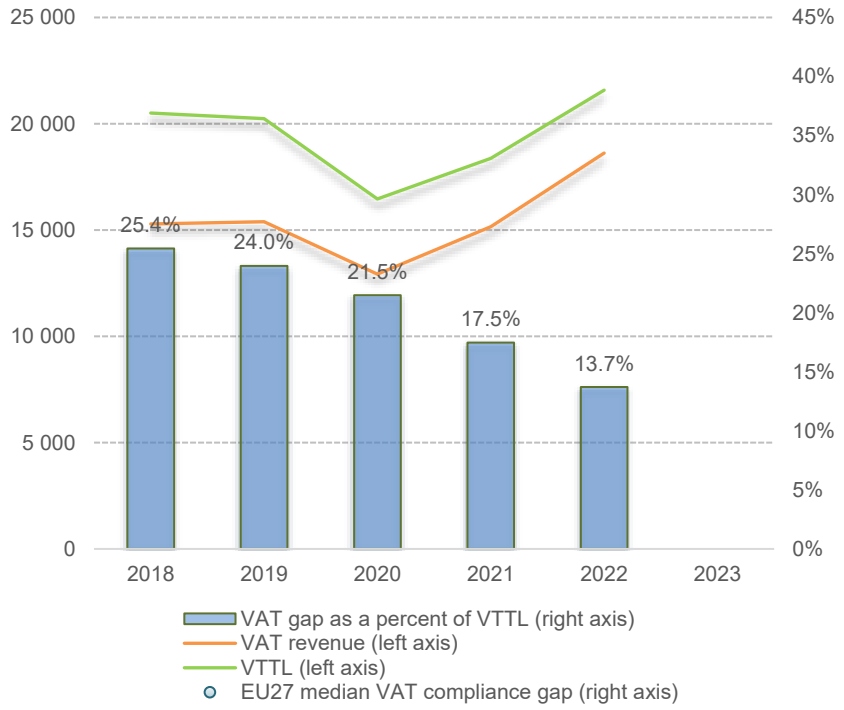
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 31: EL: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**20 503**	**20 240**	**16 461**	**18 369**	**21 580**	*X*
o/w liability on household final consumption	16 604	16 239	12 632	14 175	17 117	
o/w liability on gov. and NPISH final consumption	674	702	844	865	773	
o/w liability on intermediate consumption	1 873	1 901	1 834	1 931	2 113	
o/w liability on GFCF	1 047	1 059	888	1 110	1 236	
o/w net adjustments	305	339	264	289	340	
VAT revenue	**15 288**	**15 390**	**12 925**	**15 160**	**18 621**	*X*
VAT compliance gap	**5 215**	**4 850**	**3 536**	**3 209**	**2 959**	
VAT compliance gap (% of VTTL)	**25.4%**	**24.0%**	**21.5%**	**17.5%**	**13.7%**	*X*
VAT compliance gap change since 2018					**-11.7 pp**	

Figure 57: EL: VAT compliance gap, VAT revenue, and VTTL[39]



Source: own calculation, download underlying data.

Highlights

- In 2022, the VAT compliance gap in Greece fell by 3.8 pp down to 13.7%. This was a continuation of the downward trend that commenced in 2018.
- The preliminary estimates for Greece for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.

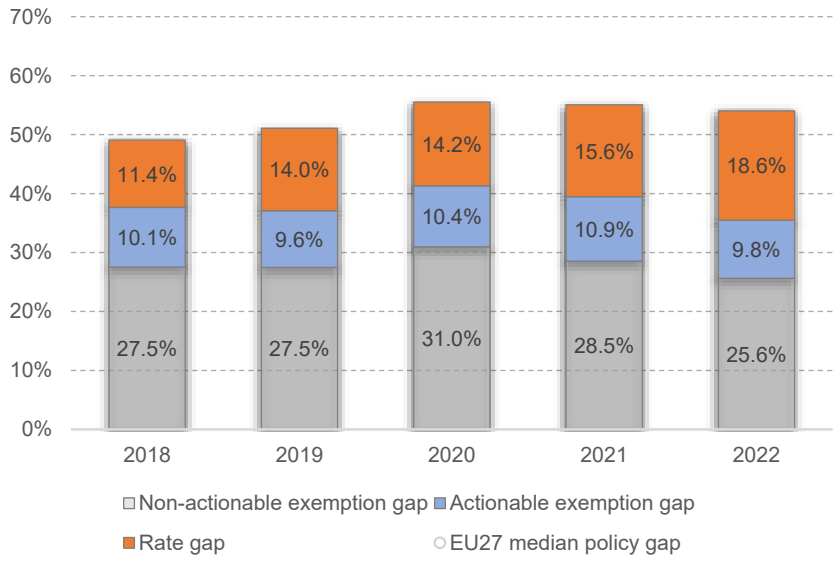
Assessed reliability of estimates:

[39] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 32: EL: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**19 745**	**21 118**	**20 552**	**22 499**	**25 362**
Exemption gap	**15 150**	**15 339**	**15 298**	**16 127**	**16 650**
o/w imputed rents	3 475	3 489	3 550	3 568	3 619
o/w public services	6 554	6 894	6 905	7 047	7 272
o/w financial services	*1 052*	*978*	*1 006*	*1 042*	*1 136*
Rate gap	**4 595**	**5 779**	**5 254**	**6 371**	**8 712**
o/w agricultural products, foodstuffs, beverages	1 631	1 908	2 122	2 191	2 493
o/w pharmaceuticals	846	842	574	645	1 054
o/w transport services	218	388	203	407	727
o/w accommodation and restaurant services	446	1 034	838	1 517	1 823
o/w utilities	380	561	719	776	982
o/w other	1 074	1 046	799	835	1 632
Actionable policy gap	**8 663**	**9 757**	**9 090**	**10 843**	**13 334**
C-efficiency (%)	**40.4%**	**39.4%**	**37.5%**	**40.1%**	**43.0%**
Statutory standard VAT rate			**24%**		
Actionable standard VAT rate	**17.9%**	**17.1%**	**16.3%**	**15.9%**	**15.5%**

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



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

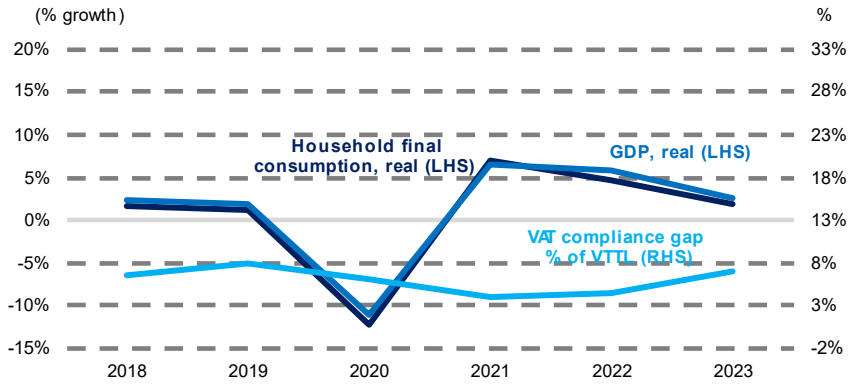
Highlights

- In the course of 2020, Greece temporarily amended its VAT rate structure by reducing rates for passenger transport, selected entertainment, and tourism services (decreasing the rate from 24% to 13%). The changes introduced at the end of 2020 were maintained until the end of 2023.
- Similar to other countries, the increase in the rate gap was balanced by the drop in the exemption gap.
- C-efficiency remained one of the lowest in the EU, which was caused by the combination of a high policy gap and a high compliance gap.

Spain

VAT revenue in Spain grew by 12.3% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing strongly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply between 2019 and 2021 and stayed low** in 2022 (Figure 59). Over this period, Spain's VAT compliance rate remained lower in 2021 and 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 59: ES: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Spanish economy grew by roughly 2% annually between 2018 and 2019. However, in 2020 the pandemic had a severe impact on the economy, leading to an 11.2% decline, due to strict lockdowns, a collapse in tourism, and disruptions to economic activity. Recovery began in 2021, with real GDP growing by approximately **6% both in 2021 and 2022**, driven by **strong domestic demand and a tourism revival**. The strong growth in GDP from 2021 correlated with robust growth in the VAT base. In nominal terms, GDP grew by 10.2% in 2022, mainly due to increased inflation.[40] Despite robust growth in 2022, the **pace varied**, with strong growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Spain has been **less affected by the impact of Russia's war of aggression against Ukraine on energy prices**, with roughly only 11% of its oil imported from Russia and relying more on renewables. Nonetheless, in 2022, the **Spanish government implemented measures** to mitigate rising energy costs, including fuel subsidies and VAT rate reductions for energy and food which ha reduced VAT revenue. Inflation rose to a record high of 8.3% in 2022 but was below the EU27 average of 9.2%. Before this, inflation had been low between 2018 and 2020, with inflation declining in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, the rise in inflation caused consumers' real disposable incomes to decline by 2.3%, with consumers dipping into the savings they had built up during the pandemic. Despite this, **real household final consumption rose by 4.7%**, just above the EU average, due to the lifting of restrictions, supporting growth in the VAT base. Taking into account the elevated rate of inflation, **this resulted in nominal**

[40] *Following the preparation of this report, nominal GDP growth for 2022 has been revised upward. Further upward revisions may be anticipated, according to the authorities.*

growth of 11.6%. A similar pattern was observed in retail sales in 2022, which grew by 2.2% in real terms and 12.5% in nominal terms in 2022.

In 2022, consumers and businesses regained confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 11.0% and 12.0% respectively, increasing VAT liability. Meanwhile, investment by financial institutions increased by 225.9% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. **In 2022, household final consumption in Spain followed a similar trend to the EU27,** with growth varying across product and service categories. In 2022, stronger growth was seen in service sectors such as **restaurants and hotels (42.5% growth) and recreational goods and services (40.2% growth).** As services are harder to tax effectively compared to traditional goods, this can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had exceeded pre-pandemic levels by 8.3% in nominal terms.

At a broad level, **the services sector exhibited faster growth in 2022 than manufacturing**, with real GVA increasing by 8.0% from 2021, and levels 2.5% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic, but it rebounded strongly, with arrivals increasing by 42.6% and back to pre-pandemic levels in 2022. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector slowed to 2.6%** due to the ongoing energy crisis.

In Spain, **e-commerce expanded from 2018 to 2022**, with online sales rising from 17.1% to 19.9% of business turnover and the share of businesses engaging in e-sales growing from 20.1% to 33.2%. Additionally, online retail sales increased from 7.2% to 8.2% during the same period. An increase in e-sales reduces cash-in-hand transactions and improves VAT compliance through better auditing.

Bankruptcy declarations in Spain increased by 36.2% in 2022, following a significant rise in 2021, as government support for businesses from the pandemic was unwound with the firms that were kept afloat now filing for insolvency. Meanwhile, bankruptcy declarations remained much lower between 2018 and 2020, with declarations declining in 2020 due to government support. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 33: ES: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	6.0%	7.0	Positive
Nominal household final consumption, restaurants & hotels	42.5%	2.2	Negative
Nominal household final consumption, custom services aggregate	41.5%	6.1	Negative
GDP services, real	8.0%	1.1	Negative
GDP, real	5.8%	-0.6	Positive
Total tourism arrivals	42.6%	-102.5	Negative
Bankruptcy declarations	36.2%	-56.5	Negative
E-commerce, % of sectors	-	5.3	Positive

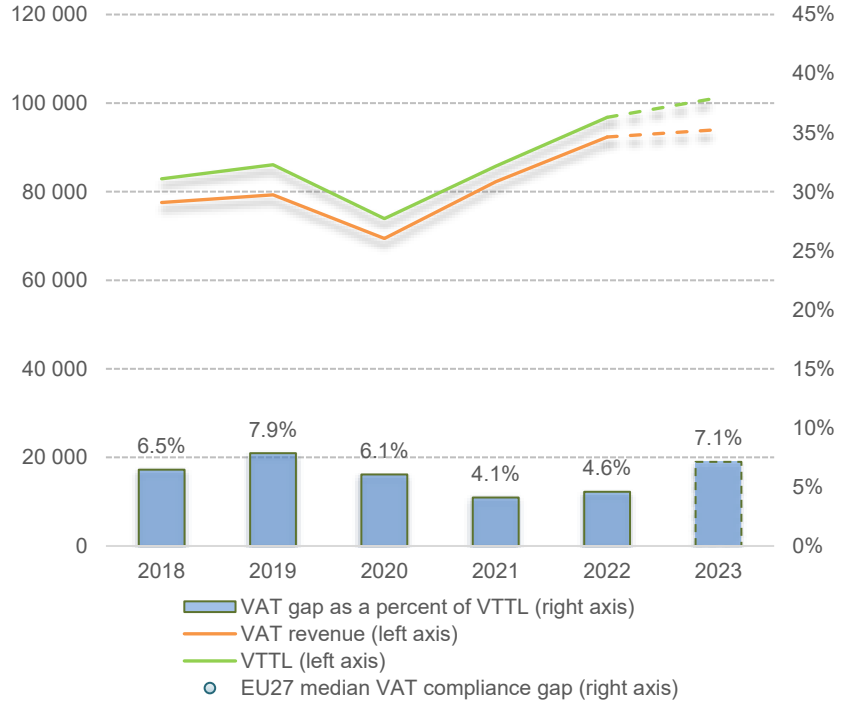
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 34: ES: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**82 896**	**86 066**	**73 911**	**85 773**	**96 787**	*101 226*
o/w liability on household final consumption	60 170	61 266	48 848	56 806	64 018	
o/w liability on gov. and NPISH final consumption	2 894	3 107	3 101	3 288	3 480	
o/w liability on intermediate consumption	10 634	11 367	11 424	13 234	15 606	
o/w liability on GFCF	8 356	9 407	9 788	11 714	12 808	
o/w net adjustments	842	919	751	731	875	
VAT revenue	**77 536**	**79 301**	**69 435**	**82 249**	**92 344**	*94 015*
VAT compliance gap	**5 360**	**6 765**	**4 476**	**3 524**	**4 443**	
VAT compliance gap (% of VTTL)	**6.5%**	**7.9%**	**6.1%**	**4.1%**	**4.6%**	*7.1%*
VAT compliance gap change since 2018					**-1.9 pp**	

Figure 60: ES: VAT compliance gap, VAT revenue, and VTTL[41]



Source: own calculation, download underlying data.

Highlights

- In 2022, the estimated VAT compliance gap in Spain increased by 0.5 percentage points, reaching 4.6% of the VTTL.
- Fast estimates indicate a significant increase in the gap in 2023, rising to 7.1% of the VTTL.
- The estimates of the VTTL for 2021 were revised upwards compared to the 2023 Study due to the revision of national accounts for this period.

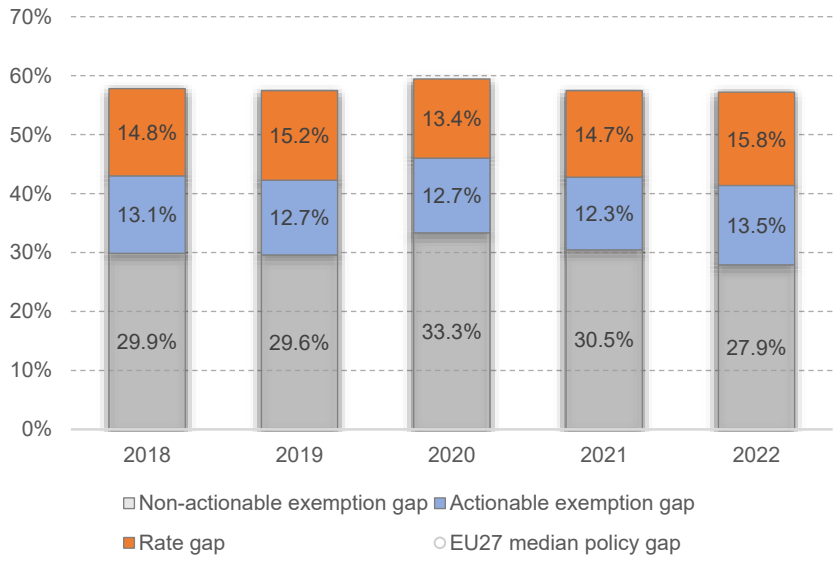
Assessed reliability of estimates:

[41] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 35: ES: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**113 564**	**116 146**	**108 282**	**115 784**	**129 385**
Exemption gap	**84 494**	**85 476**	**83 841**	**86 232**	**93 589**
o/w imputed rents	18 013	18 245	18 402	18 826	19 178
o/w public services	35 580	36 240	36 725	37 199	37 166
o/w financial services	*5 091*	*5 363*	*5 624*	*5 376*	*6 808*
Rate gap	**29 070**	**30 669**	**24 441**	**29 552**	**35 795**
o/w agricultural products, foodstuffs, beverages	8 612	8 405	9 059	9 023	9 782
o/w pharmaceuticals	2 127	2 185	2 210	3 161	3 249
o/w transport services	2 027	2 047	1 142	1 429	1 851
o/w accommodation and restaurant services	9 154	9 529	5 075	7 156	10 362
o/w utilities	389	406	396	418	1 081
o/w other	6 761	8 098	6 559	8 365	9 470
Actionable policy gap	**54 881**	**56 298**	**47 531**	**54 383**	**66 232**
C-efficiency (%)	**42.5%**	**42.3%**	**41.5%**	**44.8%**	**44.8%**
Statutory standard VAT rate			**21%**		
Actionable standard VAT rate	**13.2%**	**13.3%**	**13.5%**	**13.5%**	**13.0%**

Figure 61: ES: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

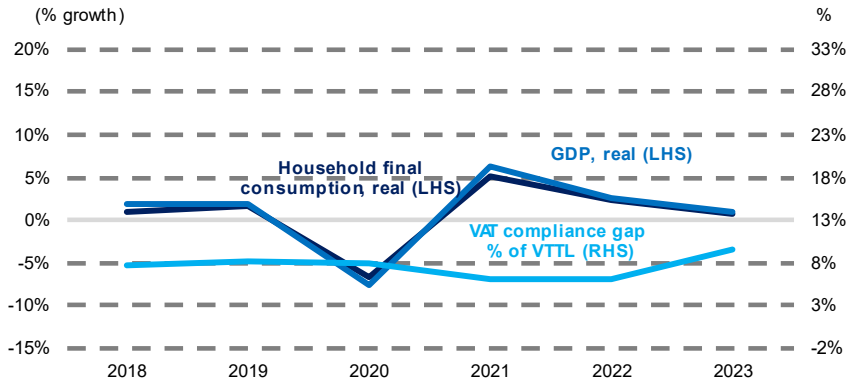
Highlights

- In 2022, to alleviate increased energy prices, Spain reduced the rate applicable to electricity (for contracts under 10 kWh). From January to June, the applicable rate was 10%, and from July to December, the rate was reduced to 5%. Additionally, the rate applicable to the supply of gas was reduced from 21% to 5% between October and December. Consequently, the rate gap increased by 2.4 percentage points over two years.
- Traditionally, Spain has one of the largest VAT policy gaps in the EU; this was also the case in 2022 when the policy gap amounted to 57.2% of notional ideal revenue. One of the main reasons for this is the application of indirect taxes other than VAT in the Canary Islands, Ceuta, and Melilla.

France

VAT revenue in France grew by 7.6% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply in 2021 and stayed low in 2022** (Figure 62). France's compliance gap remained lower in 2021 and 2022 compared to pre-pandemic levels, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 62: FR: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the French economy grew by roughly 2% annually between 2018 and 2019. However, in 2020 the pandemic had a large impact on the economy, leading to a 7.7% decline due to widespread lockdowns, restrictions on movement, and reduced consumer and business activity. Recovery began in 2021, with real GDP growing by **6.4% in 2021 and 2.5% in 2022**, driven by **strong domestic demand and government stimulus measures.** The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Nonetheless, France's recovery to pre-pandemic levels was slow relative to other Member States, only reaching 2019 levels by the end of 2022. In nominal terms, GDP grew by 5.6% in 2022, mainly due to increased inflation. Despite strong growth in 2022, the **pace varied**, with growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

France is less reliant on Russian energy compared to some of its counterparts. Despite this, to mitigate the impact of rising energy costs, the French government implemented measures such as food aid programmes, the Macron Bonus, deferred tax payments, wage subsidies and stimulus packages. Despite these efforts, inflation rose to a high of 5.9% in 2022, but remained much lower than the EU27 average of 9.2%. Previously, inflation had been low between 2018 and 2021, with inflation at only 0.5% in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, rising inflation caused growth in consumers' real disposable incomes to slow to 0.3%, with consumers topping up their incomes by dipping into the savings they had built up during the pandemic. Despite this, **real household final consumption increased by 2.3%** driven by the lifting of restrictions, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, **this resulted in nominal growth of 7.1%**.

In 2022, consumers and businesses regained confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased significantly in 2022 by 9.2% and 6.9% respectively, contributing to higher VAT liabilities.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, France's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (42.4% growth) and transportation services (16.4% growth).** Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 11.6% in nominal terms.

In 2022, **the services sector exhibited faster growth compared to the industrial sector,** with real GVA increasing by 3.4% from 2021, and reaching levels 2.7% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it rebounded strongly, with arrivals increasing by 58.2% and back to pre-pandemic levels in 2022. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector contracted by 1.3%** due to the ongoing energy crisis, with levels still below those recorded pre-pandemic.

In France, **e-commerce growth declined between 2018 and 2022**, with online sales falling from 21.6% to 11.0% of business turnover despite increasing in 2019 and 2020 during the pandemic, and the share of businesses engaging in e-sales fell marginally from 18.5% to 16.9% as financial constraints influenced consumer habits. Moreover, online retail sales decreased from 7.2% to 3.4% over the same period. The decline in e-sales has the potential to increase non-compliance risks.

In 2022, **bankruptcy declarations in France surged by 52.8%** as government support for businesses from the pandemic was phased out, leading firms that had been sustained during the crisis to file for insolvency. Before then, bankruptcy declarations had declined from 2019 to 2021 due to government support and moderate economic growth in 2019 and 2021. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 36: FR: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	3.7%	4.1	Positive
Nominal household final consumption, restaurants & hotels	42.4%	25.6	Negative
Nominal household final consumption, custom services aggregate	30.7%	17.4	Negative
GDP services, real	3.4%	-3.2	Negative
GDP, real	2.5%	-3.8	Positive
Total tourism arrivals	58.2%	37.6	Negative
Bankruptcy declarations	52.8%	64.9	Negative
E-commerce, % of sectors	-	-1.6	Positive

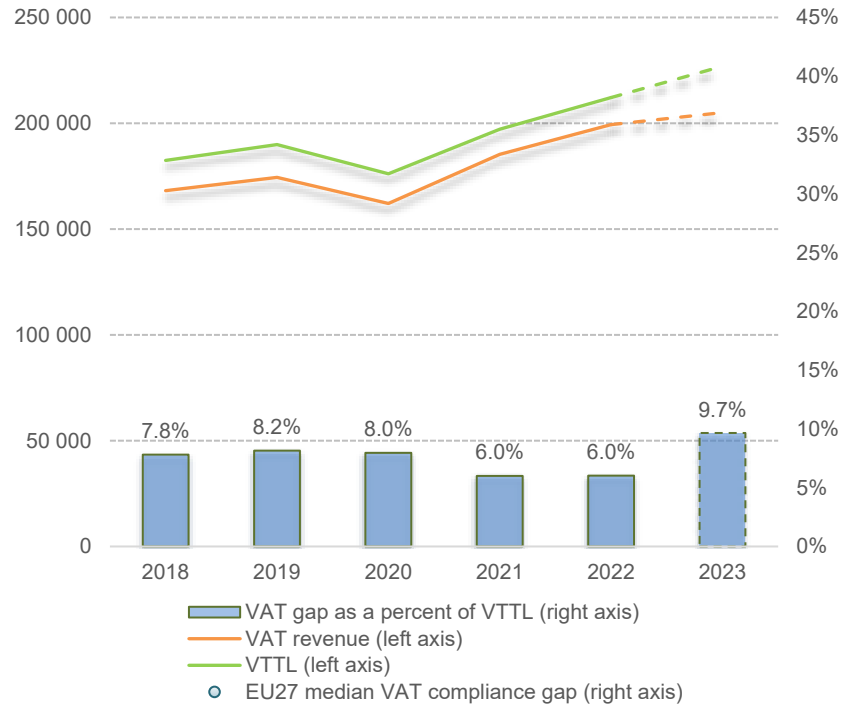
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 37: FR: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**182 436**	**189 922**	**176 118**	**197 189**	**212 146**	*226 947*
o/w liability on household final consumption	106 028	108 486	98 380	108 908	119 284	
o/w liability on gov. and NPISH final consumption	1 777	1 835	1 769	1 936	2 010	
o/w liability on intermediate consumption	32 866	34 213	33 804	38 795	41 146	
o/w liability on GFCF	37 305	40 328	37 900	43 209	44 976	
o/w net adjustments	4 461	5 060	4 265	4 342	4 730	
VAT revenue	**168 177**	**174 424**	**162 089**	**185 350**	**199 362**	*205 036*
VAT compliance gap	**14 259**	**15 498**	**14 029**	**11 839**	**12 784**	
VAT compliance gap (% of VTTL)	**7.8%**	**8.2%**	**8.0%**	**6.0%**	**6.0%**	*9.7%*
VAT compliance gap change since 2018					**-1.8 pp**	

Figure 63: FR: VAT compliance gap, VAT revenue, and VTTL[42]



Source: own calculation, download underlying data.

Highlights

- In 2022, the estimated VAT compliance gap was 6% of the VTTL, remaining unchanged compared to 2021.
- Preliminary estimates point to a substantial increase in the VAT compliance gap of nearly 4 percentage points in 2023.
- The estimates of the VTTL for 2021 were revised upwards compared to the 2023 Study due to the revision of national accounts for this period.

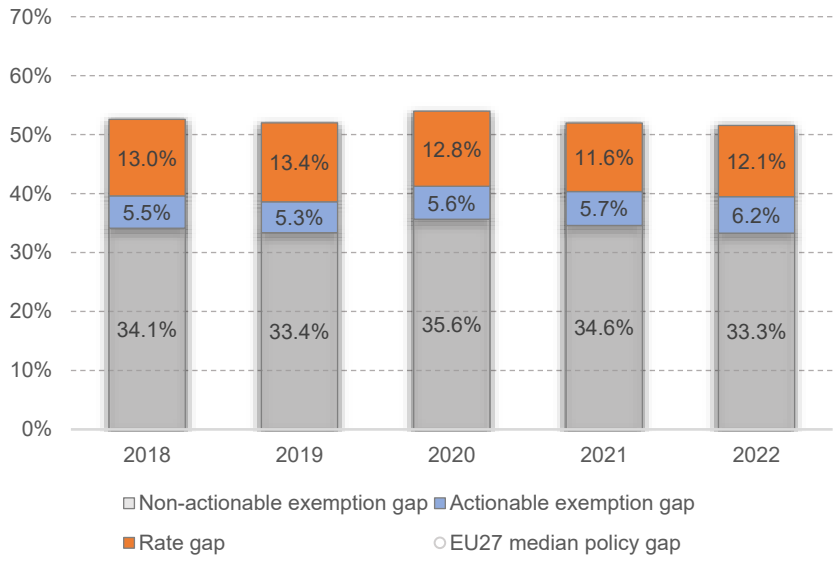
Assessed reliability of estimates:

[42] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 38: FR: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**202 274**	**205 656**	**206 607**	**213 394**	**225 847**
Exemption gap	**152 366**	**152 735**	**157 787**	**165 604**	**172 949**
o/w imputed rents	35 226	36 085	36 827	37 363	38 037
o/w public services	84 308	84 780	87 467	93 628	95 591
o/w financial services	*11 795*	*11 076*	*12 101*	*11 022*	*12 164*
Rate gap	**49 909**	**52 921**	**48 821**	**47 790**	**52 898**
o/w agricultural products, foodstuffs, beverages	23 512	24 144	25 737	24 664	24 790
o/w pharmaceuticals	2 196	2 199	2 151	1 767	1 775
o/w transport services	4 383	4 567	2 171	2 608	3 856
o/w accommodation and restaurant services	6 607	7 010	4 816	5 657	8 624
o/w utilities	2 551	2 671	2 770	2 447	2 727
o/w other	10 659	12 331	11 176	10 647	11 126
Actionable policy gap	**70 945**	**73 716**	**70 212**	**71 381**	**80 056**
C-efficiency (%)	**50.2%**	**51.1%**	**49.0%**	**52.5%**	**53.0%**
Statutory standard VAT rate			**20%**		
Actionable standard VAT rate	**14.8%**	**14.8%**	**14.8%**	**15.1%**	**14.9%**

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



Highlights

- There was no change in legislation in 2022 or 2023 that would have a significant impact on the VAT policy gap and its structure.
- In consequence, the VAT policy gap and its structure remained stable in 2022.

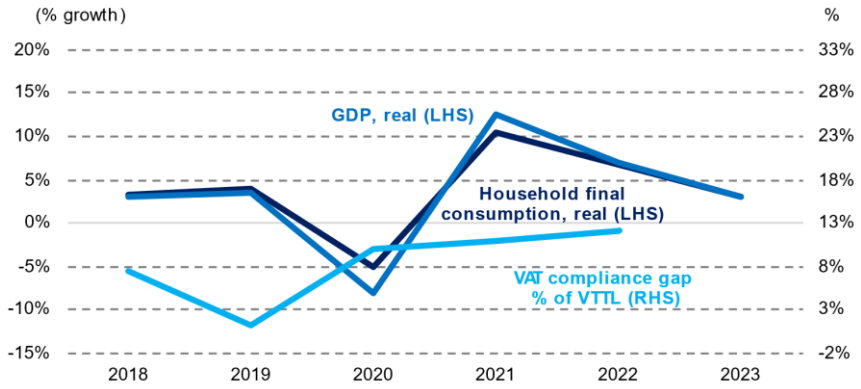
Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

Croatia

VAT revenue in Croatia grew by 16.3% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap rose sharply from 2019 to 2022** (Figure 65). Over this period Croatia's compliance gap worsened in 2021 and 2022, despite real GDP and household final consumption rebounding strongly following the pandemic.

Figure 65: HR: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Croatian economy grew by roughly 3% annually between 2018 and 2019. However, in 2020 the pandemic had a large impact on the economy, leading to an 8.1% decline, one of the more sizable declines across Member States due to the collapse in tourism, drop in consumer spending, and disruption in international trade. However, the economy bounced back in 2021, with real GDP growth of 12.6% and levels back to those recorded pre-pandemic. **Croatia was one of the fastest-recovering Member States due to the early reopening of the tourism sector**, government support, and the EU funds from the Recovery and Resilience Plan. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. In nominal terms, GDP grew by 16.0% in 2022, mainly due to increased inflation. Despite strong growth in 2022, the **pace varied**, with growth in the first three quarters of the year driven by the ongoing recovery, followed by a slower final quarter due to rising inflation triggered by Russia's war of aggression against Ukraine.

Croatia is dependent on Russia for natural gas and oil, although since the outbreak of Russia's war of aggression against Ukraine it has been trying to reduce its dependence. Despite recent adaptations, the economy has still been affected by Russia's war of aggression against Ukraine's impact on energy prices. To mitigate the impact of rising energy costs, the Croatian government implemented price controls and subsidies, income support, tax relief for individuals and businesses and VAT reductions on heating from 25% to 5% in 2022. Despite these efforts**, inflation rose to a high of 10.7% in 2022, well above the EU27 average of 9.2%**. Before this, inflation had been low between 2018 and 2020, with no growth in inflation in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, despite rising inflation growth in consumers' real disposable income grew robustly by 9.2% due to the strong economic recovery, which led to increased employment and higher wages. Adhering to the same pattern, **real household final consumption increased by 6.7%**, driven by the tourism rebound, increased confidence and pent-up demand. Taking into account the rise in inflationary pressures, **this resulted in nominal growth of 18.5%**.

In 2022, **consumers and businesses regained confidence and resumed postponed investments**, triggering VAT receipts. Investments in households, including those of non-profit institutions serving households, increased strongly in 2022 by 10.4%, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by 4.1% in 2022. However, general government investment contracted in 2022 by 6.1%.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Croatia's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (42.4% growth) and transportation services (27.6% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 24.7% in nominal terms.

In 2022, **the services sector exhibited faster growth compared to the industrial sector,** with real GVA increasing by 10.8% from 2021, and reaching levels 13.0% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it rebounded strongly, with arrivals increasing by 36.9% and above pre-pandemic levels in 2022. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector slowed to 2.1%** due to the ongoing energy crisis.

In Croatia, **e-commerce growth increased between 2018 and 2022**, with online sales rising from 11.7% to 16.5% of business turnover, and the share of businesses engaging in e-sales increased from 18.2% to 29.7%. Moreover, online retail sales rose from 4.9% to 6.7% over the same period. The surge in e-sales has the potential to decrease non-compliance risks.

Bankruptcy declarations in Croatia rose by 9.0% in 2022, continuing the upward trend from 2021, when declarations surged by 36.1%. The increase was largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 39: HR: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	16.2%	7.7	Positive
Nominal household final consumption, restaurants & hotels	42.4%	-42.1	Negative
Nominal household final consumption, custom services aggregate	20.1%	-12.8	Negative
GDP services, real	10.8%	-0.5	Negative
GDP, real	7.0%	-5.5	Positive
Total tourism arrivals	36.9%	-68.0	Negative
Bankruptcy declarations	9.0%	-27.1	Negative
E-commerce, % of sectors	-	0.0	Positive

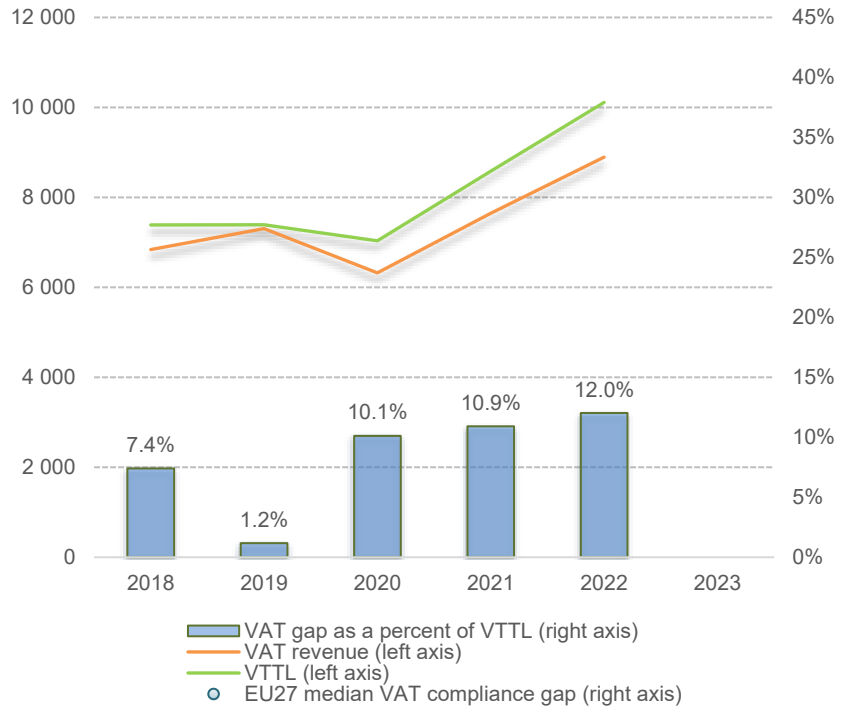
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 40: HR: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**7 389**	**7 392**	**7 034**	**8 585**	**10 112**	*X*
o/w liability on household final consumption	5 353	5 411	4 652	5 920	7 221	
o/w liability on gov. and NPISH final consumption	191	192	485	541	578	
o/w liability on intermediate consumption	1 015	1 019	850	997	1 167	
o/w liability on GFCF	820	785	1 021	1 097	1 107	
o/w net adjustments	10	- 16	26	30	39	
VAT revenue	**6 841**	**7 305**	**6 322**	**7 647**	**8 895**	*X*
VAT compliance gap	**548**	**87**	**712**	**937**	**1 216**	
VAT compliance gap (% of VTTL)	**7.4%**	**1.2%**	**10.1%**	**10.9%**	**12.0%**	*X*
VAT compliance gap change since 2018					**+4.6 pp**	

Figure 66: HR: VAT compliance gap, VAT revenue, and VTTL[43]



Highlights

- In 2022, the VAT compliance gap was estimated at 12%, which represents a 1.1 percentage point increase compared to 2021.
- The large unexplained downward shift in 2019 and the rebound in 2020 may signal some inaccuracies in the estimates for these years.
- The fast estimates for Croatia for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.

Source: own calculation, download underlying data.

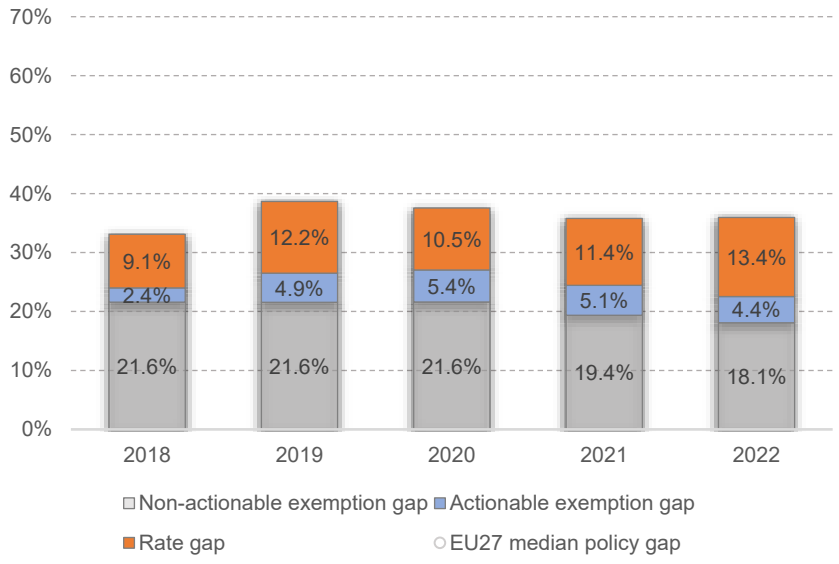
Assessed reliability of estimates:

[43] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 41: HR: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**3 657**	**4 659**	**4 228**	**4 784**	**5 674**
Exemption gap	**2 650**	**3 193**	**3 045**	**3 266**	**3 557**
o/w imputed rents	764	789	814	844	925
o/w public services	1 438	1 620	1 454	1 568	1 699
o/w financial services	*181*	*188*	*164*	*176*	*232*
Rate gap	**1 007**	**1 465**	**1 183**	**1 519**	**2 116**
o/w agricultural products, foodstuffs, beverages	195	386	369	440	679
o/w pharmaceuticals	182	273	260	288	363
o/w transport services	40	41	52	64	75
o/w accommodation and restaurant services	374	545	188	366	540
o/w utilities	112	114	159	173	246
o/w other	105	107	156	187	213
Actionable policy gap	**1 274**	**2 062**	**1 796**	**2 197**	**2 818**
C-efficiency (%)	**67.2%**	**66.6%**	**63.2%**	**63.8%**	**61.9%**
Statutory standard VAT rate			**25%**		
Actionable standard VAT rate	**21.8%**	**19.8%**	**21.2%**	**20.9%**	**20.3%**

Figure 67: HR: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

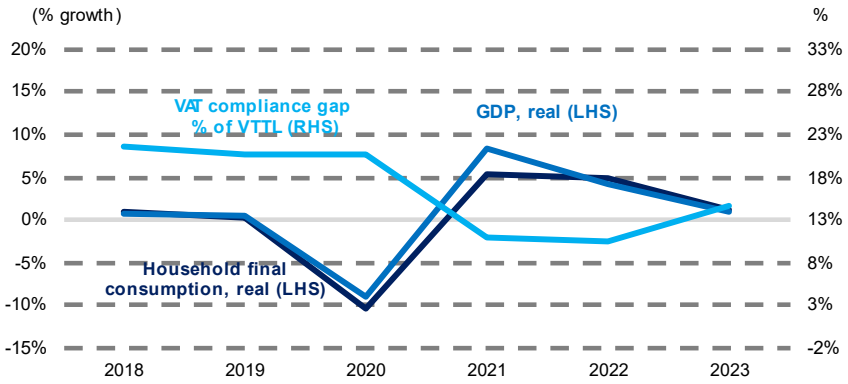
Highlights

- In 2022, the VAT policy gap remained stable, with a share in the Notional Ideal Revenue of slightly above 35%.
- From April 2022, several anti-inflationary measures were introduced, leading to an increase in the rate gap. The VAT rate on certain types of food (e.g. baby food, edible oils and fats, meat, fish, vegetables, and eggs) was reduced from 13% to 5%. The rate on the supply of natural gas and district heating was reduced from the full rate to 13%. In October 2022, further cuts were introduced: the supply of district heating and fuel wood was taxed at 5%, and the VAT rate on the installation of solar panels on private residences and public buildings was set at 0%.

Italy

VAT revenue in Italy grew by 14.5% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply from 2018 to 2022** (Figure 68). Over this period Italy's compliance gap was the lowest in 2021 and 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 68: IT: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Italian economy grew by roughly 1% annually between 2018 and 2019. However, in 2020 **the pandemic had a large impact leading to a 9.0% decline**, one of the largest declines across Member States. The sizable decline was driven by strict lockdowns, the collapse in tourism and a decline in consumer spending due to uncertainty. A recovery got underway in 2021, with real GDP growth of 8.3% and 4.1% in 2022. Despite strong growth, levels did not return to those recorded pre-pandemic until the end of 2022. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. In nominal terms, GDP grew by 7.9% in 2022, mainly due to increased inflation. Despite strong growth in 2022, **the pace varied,** with growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Italy is reliant on Russia for natural gas, which made the country particularly vulnerable to supply disruptions and price fluctuations for energy. To mitigate the impact of rising energy costs, the Italian government implemented energy subsidies, tax cuts, minimum wage hikes, temporary price caps on essential goods and the VAT rate for electricity and natural gas was temporarily reduced from 22% to 5% in 2022. Despite these efforts**, inflation rose to a high of 8.8% in 2022 but remained below the EU27 average of 9.2%**. Before this, inflation had been low between 2018-2020 with inflation contracting by 0.2% in 2020 due to reduced demand. However, inflationary pressures began to pick up in 2021 as the economy reopened.

In 2022, **rising inflation caused growth in consumers' real disposable incomes to contract by 1.7%**, with consumers topping up their incomes by dipping into the savings they had built up during the pandemic. Despite this, real household final consumption increased by 4.9%, driven by the lifting of restrictions, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 12.9%.

In 2022, **consumers and businesses continued to resume their postponed investments following the easing of restrictions**, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased in 2022 by 1.3% and 20.5% respectively, contributing to higher VAT liabilities. Non-financial corporations saw strong investment growth of 14.6%, but a large proportion of the VAT will be reclaimed by businesses making this aggregate VAT revenue neutral.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Italy's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (35.4% growth) and on recreational goods and services (22.6% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. Despite such strong growth in 2022, household final consumption of services in nominal terms remained just below the levels recorded pre-pandemic.

In 2022, **the services sector exhibited faster growth compared to the industrial sector,** with real GVA increasing by 4.8% from 2021, and reaching levels 2.4% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it began recovering, with arrivals increasing by 84.9% but levels remain 20.1% below pre-pandemic levels in 2022. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector increased by 3.6%.**

In Italy, **e-commerce growth increased between 2018 and 2022**, with online sales rising from 10.7% to 17.8% of business turnover, and the share of businesses engaging in e-sales increased from 14.2% to 18.3%. Moreover, online retail sales dipped in 2019 then rose from 3.1% to 4.5% in 2022. The surge in e-sales has the potential to decrease non-compliance risks.

Bankruptcy declarations in Italy rose by 18.5% in 2021, with the increase largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. Unlike the EU27 trend, bankruptcy declarations declined by 20.3% in 2022. However, this does not necessarily indicate a long-term improvement in the overall financial health of Italian businesses.

Table 42: IT: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	5.5%	4.9	Positive
Nominal household final consumption, restaurants & hotels	35.4%	11.9	Negative
Nominal household final consumption, custom services aggregate	27.2%	10.2	Negative
GDP services, real	4.8%	-1.2	Negative
GDP, real	4.1%	-4.1	Positive
Total tourism arrivals	84.9%	80.3	Negative
Bankruptcy declarations	-20.3%	-38.8	Negative
E-commerce, % of sectors	-	-0.1	Positive

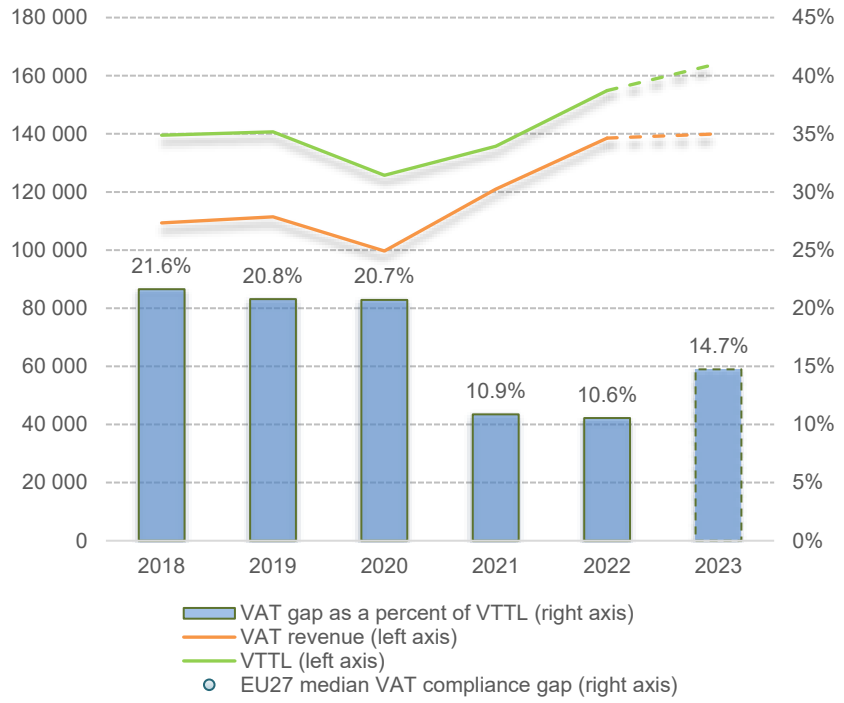
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 43: IT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**139 532**	**140 704**	**125 728**	**135 734**	**154 879**	*164 206*
o/w liability on household final consumption	102 153	103 383	88 716	93 124	107 716	
o/w liability on gov. and NPISH final consumption	1 597	1 605	1 975	2 072	2 332	
o/w liability on intermediate consumption	22 371	22 629	22 328	22 703	24 689	
o/w liability on GFCF	13 696	15 098	14 588	19 719	22 190	
o/w net adjustments	- 285	-2 011	-1 879	-1 885	-2 048	
VAT revenue	**109 333**	**111 464**	**99 683**	**120 980**	**138 533**	*139 998*
VAT compliance gap	**30 199**	**29 240**	**26 045**	**14 754**	**16 346**	
VAT compliance gap (% of VTTL)	**21.6%**	**20.8%**	**20.7%**	**10.9%**	**10.6%**	*14.7%*
VAT compliance gap change since 2018					**-11.1 pp**	

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



Source: own calculation, download underlying data.

Highlights

- The sudden increase in VAT compliance in 2021 and 2022 coincides with the introduction of Superbonus 110, a tax regulation mechanism that allows a 110% tax deduction on expenditures made to improve a home's energy efficiency, lower its seismic risk, and undertake additional works that are not specific to energy efficiency, such as the installation of photovoltaic systems or charging points for electric vehicles.
- In 2023, the VAT compliance gap is expected to increase, but it will still remain well below the values observed before 2021.
- The estimates of the VTTL for 2021 were revised upwards compared to the 2023 Study due to the revision of national accounts for this period.

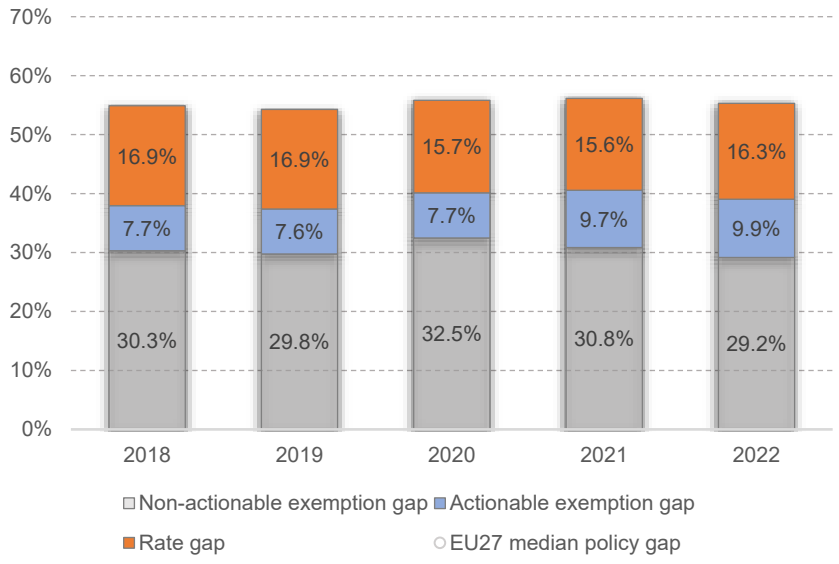
Assessed reliability of estimates:

[44] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 44: IT: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**169 773**	**167 049**	**158 869**	**173 733**	**191 559**
Exemption gap	**117 420**	**115 051**	**114 214**	**125 549**	**135 262**
o/w imputed rents	32 877	32 837	33 220	33 559	34 380
o/w public services	56 481	54 307	54 313	57 088	60 285
o/w financial services	*4 331*	*4 462*	*4 902*	*4 815*	*6 348*
Rate gap	**52 354**	**51 997**	**44 656**	**48 184**	**56 297**
o/w agricultural products, foodstuffs, beverages	21 586	20 923	21 307	18 258	19 050
o/w pharmaceuticals	663	697	665	448	752
o/w transport services	2 691	2 955	1 404	1 600	2 091
o/w accommodation and restaurant services	12 238	12 374	7 333	8 689	11 336
o/w utilities	1 191	1 206	1 124	1 441	2 412
o/w other	13 985	13 843	12 823	17 748	20 656
Actionable policy gap	**76 085**	**75 442**	**66 434**	**78 271**	**90 546**
C-efficiency (%)	**38.7%**	**39.2%**	**38.1%**	**43.9%**	**45.1%**
Statutory standard VAT rate			**22%**		
Actionable standard VAT rate	**14.7%**	**14.7%**	**14.7%**	**14.1%**	**14.0%**

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



Highlights

- The VAT policy gap in Italy decreased from 56.1% in 2021 to 55.3% in 2022.
- Despite the large increase from 2020, the C-efficiency remains relatively low due to the high level of the policy gap.
- If the actionable exemptions and reduced rates were discontinued, the current VTTL could be achieved with a statutory standard rate of 14-15%.

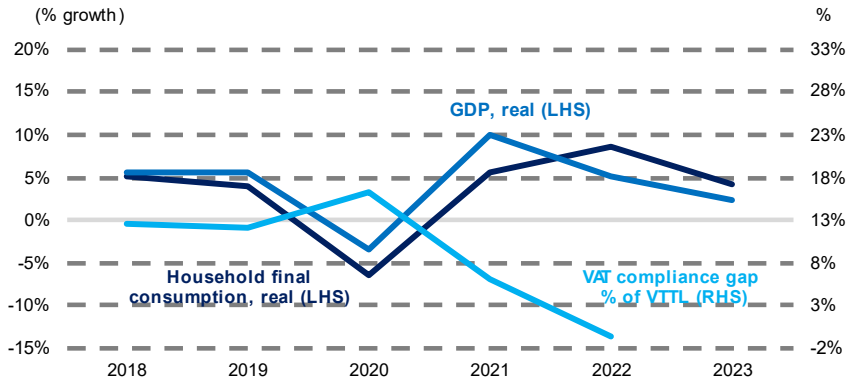
Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

Cyprus

VAT revenue in Cyprus grew by 24.0% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fell sharply in 2021** (Figure 71). Cyprus' compliance gap was the lowest in 2021, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 71: CY: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, **the Cyprus economy grew by roughly 6% annually between 2018 and 2019**. However, in 2020 the pandemic had a sizable impact on the economy, leading to a 3.4% decline. This was driven by the collapse of the tourism sector, and restricted activity and movement, resulting in a large decline in household final consumption. **A strong recovery got underway in 2021**, with GDP growth of 9.9% in 2021 and 5.1% in 2022, driven by the easing of travel restrictions, government support and pent-up demand. As a result, levels rose above pre-pandemic levels by the end of 2021, ahead of many other Member States. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. In nominal terms, GDP grew by 11.4% in 2022, mainly due to increased inflation. Despite strong growth in 2022, **the pace varied,** with growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Cyprus has been less affected by the impact of Russia's war of aggression against Ukraine on energy prices due to its minimal dependence on Russian energy. Nonetheless, in 2022 the Cyprus government implemented measures to mitigate rising energy costs, including VAT reductions on electricity from 19% to 5%, electricity and fuel subsidies, direct financial aid, and wage increases. Despite this, inflation rose to a high of 8.1% in 2022 but was below the EU27 average of 9.2%. Before this, inflation had been low between 2018 and 2020, with inflation contracting in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, **rising inflation caused growth in consumers' real disposable incomes to slow to 0.6%**, with consumers topping up their incomes by dipping into the savings they had built up during the pandemic. Despite this, real household final consumption was resilient and increased by 8.6%, driven by the lifting of restrictions, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 15.6%.

In 2022, **consumers and businesses resumed their postponed investments following the easing of restrictions**, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased in 2022 by 8.9% and 13.8% respectively, contributing to higher VAT liabilities. Additionally, investment by financial institutions increased by 13.8% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Cyprus' nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. Notably, there was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (36.7% growth) and transport services (29.6% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 10.5% in nominal terms.

The hospitality sector was one of the hardest hit by the pandemic, but it started to recover in 2022, but from a low base, with arrivals increasing by 65.1%. Despite this, **levels had only recovered 79.1% of those recorded pre-pandemic.** As hospitality is a services sector, it has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **growth in the industrial sector increased by 1.8%,** up from -0.5% in 2021, but levels remained below those recorded pre-pandemic.

In Cyprus, **e-commerce growth dipped in 2021 but trended upwards from 2018 to 2022**, with online sales rising from 4.5% in 2018 to 5.4% of business turnover in 2022, and the share of businesses engaging in e-sales increased from 14.2% to 22.0%. Moreover, online retail dipped in 2020 but typically trended upwards from 3.0% in 2018 to 4.3% in 2022. The surge in e-sales has the potential to decrease non-compliance risks.

Bankruptcy declarations in Cyprus followed a different trend compared to other Member States, with their number declining from 2020 to 2022. In 2022, **bankruptcy declarations decreased by 36.7%**, with government support from the pandemic continuing to support businesses in reducing the filing of insolvency. However, this trend may reverse when government support is removed. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 45: CY: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	12.5%	4.0	Positive
Nominal household final consumption, restaurants & hotels	36.7%	-34.0	Negative
Nominal household final consumption, custom services aggregate	28.9%	-18.9	Negative
GDP, real	5.1%	-4.9	Positive
Total tourism arrivals	65.1%	-140.8	Negative
Bankruptcy declarations	-36.7%	-27.6	Negative
E-commerce, % of sectors	-	3.2	Positive

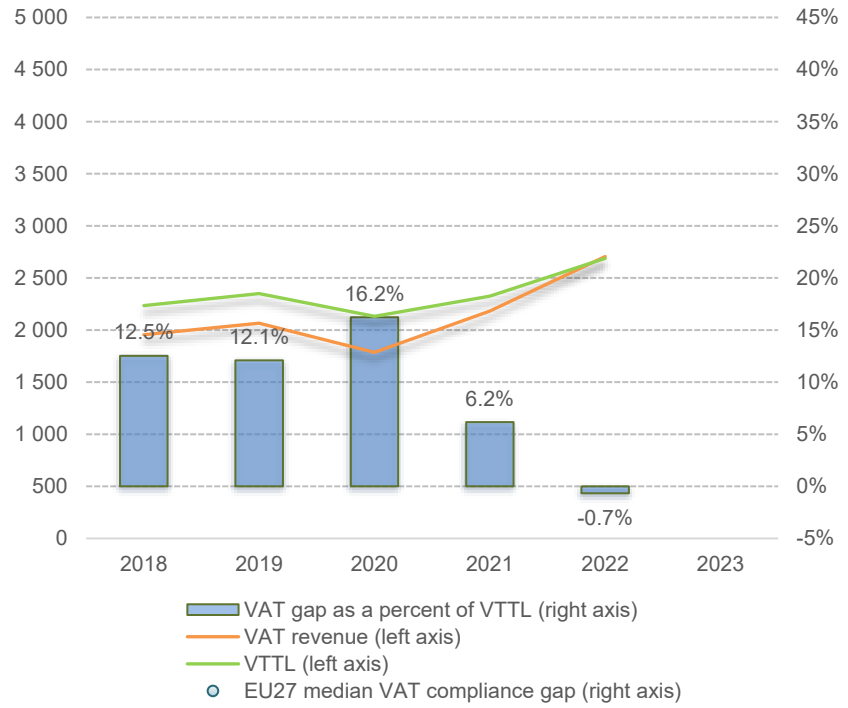
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 46: CY: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**2 235**	**2 350**	**2 132**	**2 325**	**2 688**	*X*
o/w liability on household final consumption	1 298	1 341	1 107	1 282	1 533	
o/w liability on gov. and NPISH final consumption	28	29	33	40	44	
o/w liability on intermediate consumption	466	502	507	491	508	
o/w liability on GFCF	413	445	452	472	549	
o/w net adjustments	29	33	33	39	53	
VAT revenue	**1 955**	**2 066**	**1 786**	**2 182**	**2 706**	*X*
VAT compliance gap	**280**	**284**	**346**	**143**	**- 18**	
VAT compliance gap (% of VTTL)	**12.5%**	**12.1%**	**16.2%**	**6.2%**	**-0.7%**	*X*
VAT compliance gap change since 2018					**-13.2 pp**	

Figure 72: CY: VAT compliance gap, VAT revenue, and VTTL[45]



Source: own calculation, download underlying data.

Highlights

- There is some uncertainty around the estimates of the VAT Total Tax Liability (VTTL) for Cyprus. The hike in 2020 and the declines in 2021 and 2022 may be somewhat affected by deferred payments or other elements that were not fully controlled in the modeling.
- The estimates of the VAT compliance gap for 2022 are negative, which is a clear signal of inaccuracies in the underying data.
- The preliminary estimates for Cyprus for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.

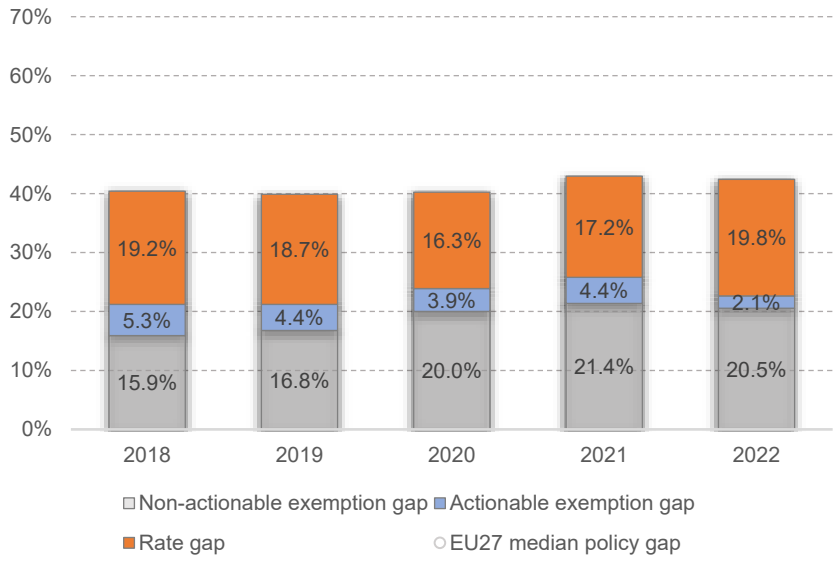
Assessed reliability of estimates:

[45] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 47: CY: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**1 515**	**1 559**	**1 436**	**1 751**	**1 978**
Exemption gap	**795**	**829**	**853**	**1 051**	**1 057**
o/w imputed rents	240	254	268	284	303
o/w public services	469	517	559	662	710
o/w financial services	*- 112*	*- 115*	*- 112*	*- 75*	*- 55*
Rate gap	**720**	**730**	**583**	**700**	**922**
o/w agricultural products, foodstuffs, beverages	233	234	242	273	313
o/w pharmaceuticals	39	43	47	38	42
o/w transport services	77	88	21	33	79
o/w accommodation and restaurant services	201	188	82	176	285
o/w utilities	13	12	12	24	15
o/w other	157	165	179	157	187
Actionable policy gap	**918**	**903**	**722**	**880**	**1 020**
C-efficiency (%)	**61.2%**	**61.2%**	**59.1%**	**63.3%**	**68.6%**
Statutory standard VAT rate			**19%**		
Actionable standard VAT rate	**14.2%**	**14.2%**	**14.9%**	**14.2%**	**14.2%**

Figure 73: CY: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

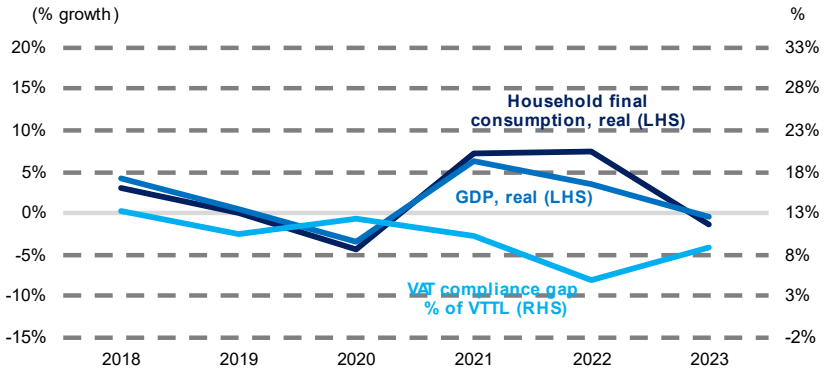
Highlights

- At the end of 2021, Cyprus reduced the VAT rate applicable to the supply of electricity from 19% to 9% for three months. At the same time, the rate for vulnerable households was reduced to 5% for a six-month period. In addition, for the last four months of 2022, Cyprus introduced an exemption from VAT (and excise taxes) on petroleum products.
- The VAT policy gap in Cyprus remains relatively low compared to other EU Member States. This is largely due to the significant role of the financial sector providing services abroad and the lack of a right to deduct input VAT for these providers on services rendered within the EU. As a result, large sums of hidden tax have increased overall VAT revenue compared to a scenario assuming the taxability of output and the deductibility of intermediate inputs.

Latvia

VAT revenue in Latvia grew by 26.4% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap has trended downward between 2018 and 2022 except for 2020** (Figure 74). Over this period Latvia's compliance gap was lower in 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 74: LV: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, growth in the Latvian economy varied between 2018 and 2019, with strong growth of 4.2% recorded in 2018 before slowing to 0.6% in 2019 due to cooling investment. However, in 2020 **the pandemic had a sizable impact on the economy** leading to a 3.5% decline. This was due to widespread lockdowns, travel restrictions and disruption to supply chains. **A strong recovery got underway in 2021**, with GDP growth of 6.4% in 2021 and 3.5% in 2022, driven by the easing of travel restrictions, government support and pent-up demand. As a result, levels returned to pre-pandemic levels by the end of 2021, ahead of many other Member States. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. In nominal terms, GDP grew by 15.2% in 2022, mainly due to increased inflation. Despite strong growth in 2022, **the pace varied,** with growth in the first half of the year driven by the ongoing recovery, followed by slower growth in the second half of the year due to rising inflation triggered by Russia's war of aggression against Ukraine.

Latvia has been dependent on Russia for natural gas. Since the outbreak of Russia's war of aggression against Ukraine it has made significant strides in reducing its dependency. Despite this, the economy was still affected by the impact of Russia's war of aggression against Ukraine on energy prices. To mitigate the impact of rising energy costs, the Latvian government implemented energy support measures including increased social benefits, subsidies and price caps. Despite these efforts, **inflation rose to a high of 17.2% in 2022**, the third-highest rate across all Member States. Before this, inflation was stable at around 3% between 2018 and 2019, before inflation slowed to 0.1% in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, **rising inflation caused growth in consumers' real disposable incomes to decline by 1.8%**, with consumers topping up their incomes by dipping into the savings they had built up during the pandemic. Despite this, real household final consumption was resilient and increased by 7.4%, due to pent-up demand, a strong labour market, government support and remittances, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 21.5%.

In 2022, **consumers and businesses resumed their postponed investments following the easing of restrictions**, triggering VAT receipts. Investments by households, including those by non-profit institutions serving households, increased in 2022 by a robust 4.9%, contributing to higher VAT liabilities. Investments by financial institutions saw a much stronger growth of 46.0% in 2022. On the other hand, investments by the general government contracted by 16.2% in 2022.

Latvia's nominal household final consumption in 2022 mirrored trends seen across the EU27, with growth varying across products and services categories. There was substantial growth in the services sector in 2022, with increased spending on **restaurants and hotels (72.1% growth) and recreational goods and services (38.1% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 18.9% in nominal terms.

The hospitality sector was one of the hardest hit by the pandemic, but it started to recover in 2022, but from a low base, with arrivals increasing by 131.0%. Despite this, **levels had only recovered 54.4% of those recorded pre-pandemic.** Latvia remained the furthest behind in the tourism recovery compared to all Member States. As hospitality is a services sector it has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **no growth was recorded in the industrial sector in 2022,** but levels remained well above those recorded pre-pandemic.

In Latvia, **e-commerce growth increased between 2018 and 2022**, with online sales rising from 6.1% in 2018 to 10.1% of business turnover in 2022, and the share of businesses engaging in e-sales increased from 13.0% to 18.0%. Moreover, online retail increased from 2.7% in 2018 to 5.5% in 2022. The surge in e-sales has the potential to decrease non-compliance risks.

Bankruptcy declarations in Latvia increased by 22.9% in 2022, after declining for the previous two years. The increase was largely due to the phasing out of government pandemic support, resulting in firms that had been sustained during the crisis filing for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 48: LV: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	21.0%	11.2	Positive
Nominal household final consumption, restaurants & hotels	72.1%	67.1	Negative
Nominal household final consumption, custom services aggregate	58.6%	51.8	Negative
GDP, real	3.5%	-2.9	Positive
Total tourism arrivals	131.0%	167.5	Negative
Bankruptcy declarations	22.9%	54.8	Negative
E-commerce, % of sectors	-	0.9	Positive

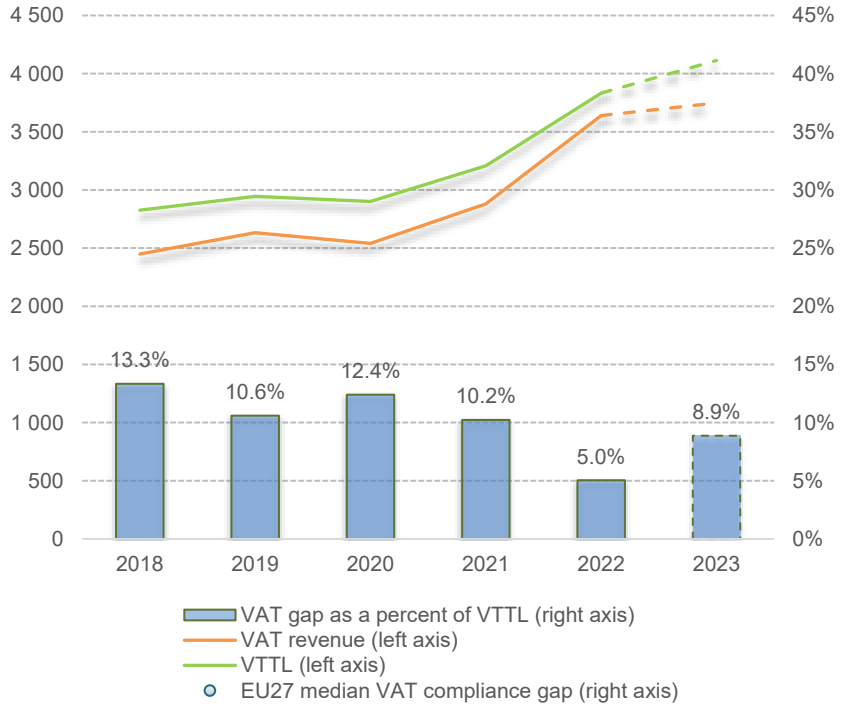
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 49: LV: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**2 826**	**2 944**	**2 900**	**3 208**	**3 833**	*4 113*
o/w liability on household final consumption	2 075	2 132	2 044	2 280	2 876	
o/w liability on gov. and NPISH final consumption	69	69	73	81	83	
o/w liability on intermediate consumption	442	500	496	539	628	
o/w liability on GFCF	293	299	338	365	312	
o/w net adjustments	- 53	- 56	- 51	- 57	- 66	
VAT revenue	**2 449**	**2 632**	**2 541**	**2 880**	**3 639**	*3 748*
VAT compliance gap	**377**	**312**	**360**	**328**	**193**	
VAT compliance gap (% of VTTL)	**13.3%**	**10.6%**	**12.4%**	**10.2%**	**5.0%**	*8.9%*
VAT compliance gap change since 2018					**-8.3 pp**	

Figure 75: LV: VAT compliance gap, VAT revenue, and VTTL[46]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap in 2022 was estimated at 5% of the VTTL, which was more than 5 percentage points below the values observed in recent years.
- The VAT compliance gap in 2023 is expected to have increased by about 4 percentage points.

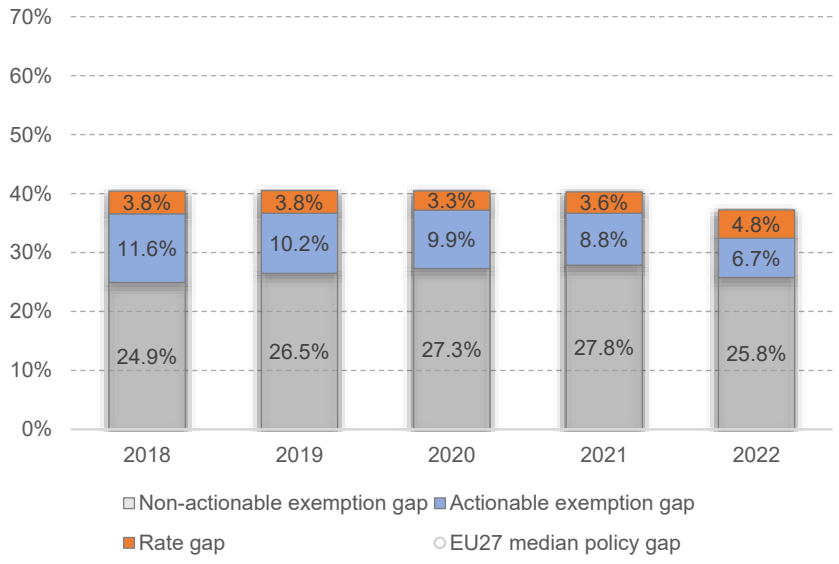
Assessed reliability of estimates:

[46] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 50: LV: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**1 917**	**2 005**	**1 971**	**2 165**	**2 272**
Exemption gap	**1 735**	**1 816**	**1 813**	**1 970**	**1 980**
o/w imputed rents	433	463	478	516	531
o/w public services	672	769	780	901	937
o/w financial services	*78*	*77*	*72*	*79*	*105*
Rate gap	**182**	**189**	**159**	**194**	**292**
o/w agricultural products, foodstuffs, beverages	28	36	41	51	54
o/w pharmaceuticals	28	29	27	37	76
o/w transport services	75	76	44	54	74
o/w accommodation and restaurant services	21	21	14	14	17
o/w utilities	18	17	16	20	35
o/w other	13	12	17	19	35
Actionable policy gap	**734**	**696**	**642**	**669**	**699**
C-efficiency (%)	**57.4%**	**58.7%**	**58.1%**	**59.0%**	**64.2%**
Statutory standard VAT rate			**21%**		
Actionable standard VAT rate	**17.7%**	**17.7%**	**18.1%**	**18.3%**	**18.1%**

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



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

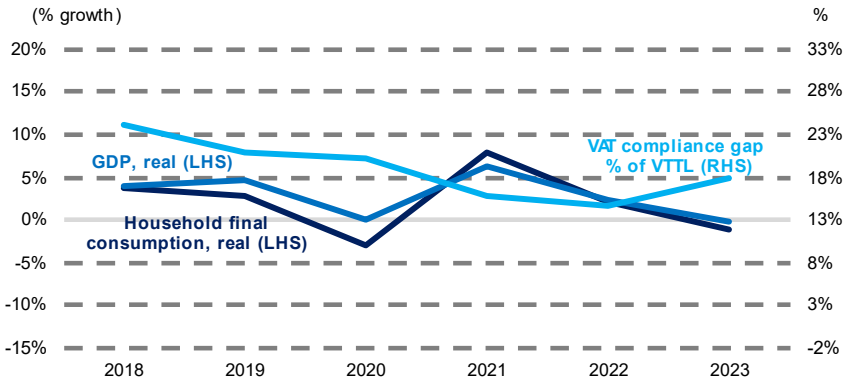
Highlights

- As of January 2022, the application of the 5% VAT rate was extended to books published in both printed and electronic editions, as well as to supplies of press and other mass media publications, including those available online or by download.
- Despite an increase in the rate gap, a much larger decline in the VAT exemption gap led to an approximately 3 percentage point decline in the VAT policy gap in 2023.

Lithuania

VAT revenue in Lithuania grew by 20.4% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap trended downward between 2018 and 2022** (Figure 77). Over this period Lithuania's compliance gap was lower in 2021 and 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 77: LT: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, the Lithuanian economy grew on average 4.3% annually between 2018 and 2019. **Lithuania was one of the few Member States that managed to avoid a GDP contraction in 2020**, with growth of 0.1%. This was attributed to a quick recovery from the pandemic and strong export performance in manufacturing and technology. The economy continued to grow strongly in 2021 and 2022, with GDP growth of 6.2% and 2.4% respectively. In nominal terms, GDP grew by 19.4% in 2022, supported by increased inflation driving up prices.

Lithuania has previously been dependent on Russia for natural gas. However, since the opening of the Klaipėda LNG terminal in 2014, it has been able to diversify its gas sources. Despite this, the economy was recently affected by the impact of Russia's war of aggression against Ukraine on energy prices. To mitigate the impact of rising energy costs, the Lithuanian government implemented price caps on electricity and gas, direct financial compensation to offset a portion of energy bills, temporary tax breaks, investment in energy efficiency incentives and VAT reductions for electricity and natural gas. Despite these efforts, inflation rose to a high of 18.9% in 2022, the second-highest rate across all Member States. Before this, inflation was stable at around 2% between 2018 and 2019, before inflation slowed to 1.1% in 2020 due to reduced demand. However, inflationary pressures began to rise sharply in 2021 as the economy reopened.

In 2022, **rising inflation caused growth in consumers' real disposable incomes to decline by 4.6%**. Despite this, real household final consumption was robust and increased by 2.0%, due to pent-up demand, a strong labour market, and government support and remittances, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 21.0%.

In 2022, as economic uncertainty fell back following the easing of restrictions, **consumers and businesses invested more**, triggering VAT receipts. Investment by the general government and by households, the latter including non-profit institutions serving households, increased in 2022 by 18.4%

and 28.0% respectively, contributing to higher VAT liabilities. Investment by financial institutions saw growth of 12.1% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Lithuania's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was substantial growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (39.8% growth) and transportation services (30.6% growth).** Since services are harder to tax effectively than traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 26.8% in nominal terms.

The hospitality sector was one of those hardest hit by the pandemic, but it started to recover in 2022, but from a low base, with arrivals increasing by 127.0%. Despite this, **levels had only recovered 76.2% of those recorded pre-pandemic and were well behind the EU27 average of 90.0% in 2022.** As hospitality is a services sector it has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, growth slowed in the industrial sector to 3.8% in 2022 from 8.7% in 2021, but levels remained well above those recorded pre-pandemic.

In Lithuania, **e-commerce growth increased between 2018 to 2022**, with online sales rising from 13.0% in 2018 to 17.7% of business turnover in 2022, and the share of businesses engaging in e-sales increased from 22.4% to 37.6%. Moreover, online retail increased from 6.6% in 2018 to 11.4% in 2022. The surge in e-sales has the potential to decrease non-compliance risks.

Bankruptcy declarations in Lithuania increased by 39.1% in 2022, after contracting for the previous four years. The increase was largely due to the end of government pandemic support, leading companies that had been kept afloat during the crisis to declare insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collections.

Table 51: LT: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	14.1%	8.3	Positive
Nominal household final consumption, restaurants & hotels	39.8%	12.6	Negative
Nominal household final consumption, custom services aggregate	33.3%	20.3	Negative
GDP, real	2.4%	-3.7	Positive
Total tourism arrivals	127.0%	131.2	Negative
Bankruptcy declarations	39.1%	42.6	Negative
E-commerce, % of sectors	-	1.6	Positive

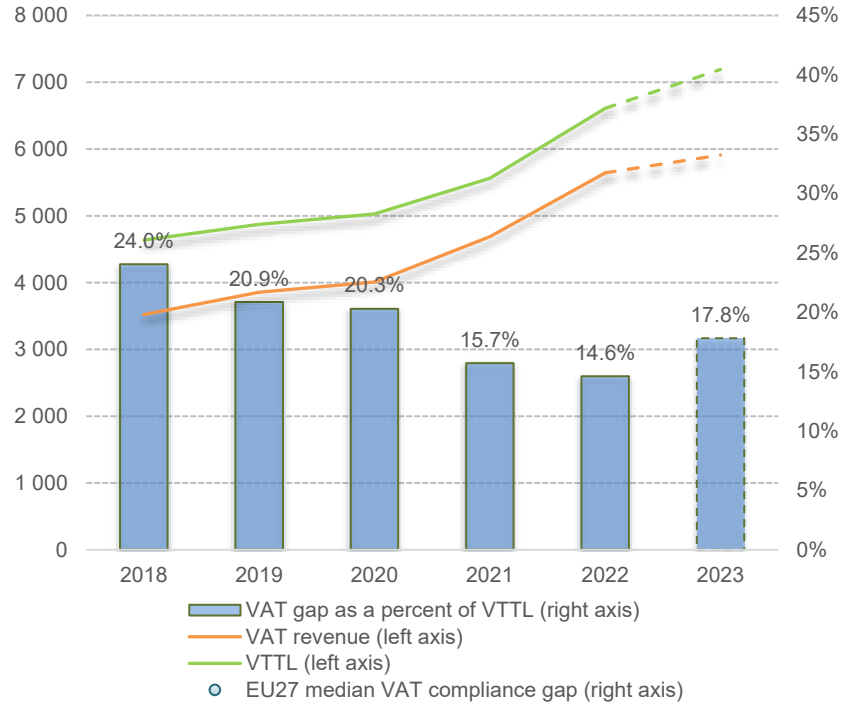
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 52: LT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**4 637**	**4 872**	**5 029**	**5 562**	**6 610**	*7 192*
o/w liability on household final consumption	3 846	3 995	3 951	4 428	5 165	
o/w liability on gov. and NPISH final consumption	43	52	52	60	65	
o/w liability on intermediate consumption	456	499	548	632	771	
o/w liability on GFCF	570	646	810	785	948	
o/w net adjustments	- 279	- 319	- 333	- 343	- 339	
VAT revenue	**3 522**	**3 856**	**4 009**	**4 688**	**5 644**	*5 911*
VAT compliance gap	**1 115**	**1 017**	**1 020**	**875**	**966**	
VAT compliance gap (% of VTTL)	**24.0%**	**20.9%**	**20.3%**	**15.7%**	**14.6%**	*17.8%*
VAT compliance gap change since 2018					**-9.4 pp**	

Figure 78: LT: VAT compliance gap, VAT revenue, and VTTL[47]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap has followed a downward trend since 2018; however, the gap remains above the EU average. The trend is expected to have reversed in 2023, and the gap is projected to have increased.
- In 2022, the i.KON system was launched in Lithuania. Based on data from the State Tax Inspectorate, the system detects discrepancies in VAT reporting in real time, processes them more efficiently, and performs a more accurate risk assessment.
- The national accounts figures for 2023 were revised shortly before the publication of the report. The update of the underlying figure will leead ot the revision of the fast estimates of the VAT compliacne gap.

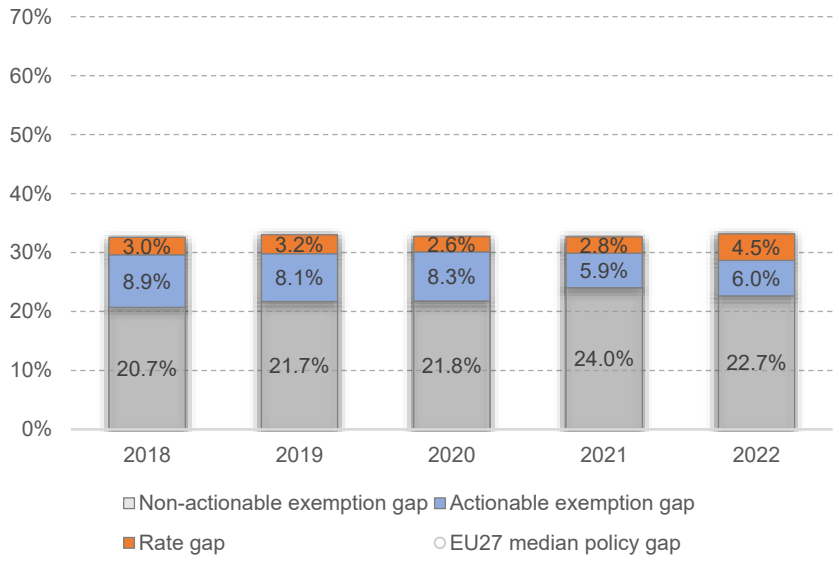
Assessed reliability of estimates:

[47] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data. The national accounts figures for 2023 were revised shortly before the publication of the report. This update to the underlying figures will lead to a revision of the fast estimates of the VAT compliance gap.*

Table 53: LT: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**2 240**	**2 401**	**2 445**	**2 696**	**3 281**
Exemption gap	**2 036**	**2 167**	**2 250**	**2 468**	**2 835**
o/w imputed rents	312	335	361	399	491
o/w public services	980	1 105	1 130	1 431	1 549
o/w financial services	*129*	*138*	*137*	*153*	*201*
Rate gap	**204**	**234**	**196**	**228**	**446**
o/w agricultural products, foodstuffs, beverages	0	16	15	16	18
o/w pharmaceuticals	73	86	83	88	109
o/w transport services	60	71	28	35	52
o/w accommodation and restaurant services	25	25	19	24	185
o/w utilities	62	57	47	53	60
o/w other	- 17	- 21	3	13	22
Actionable policy gap	**818**	**824**	**817**	**713**	**1 040**
C-efficiency (%)	**53.3%**	**55.2%**	**57.0%**	**59.5%**	**60.7%**
Statutory standard VAT rate			**21%**		
Actionable standard VAT rate	**18.0%**	**18.0%**	**18.4%**	**18.5%**	**18.0%**

Figure 79: LT: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

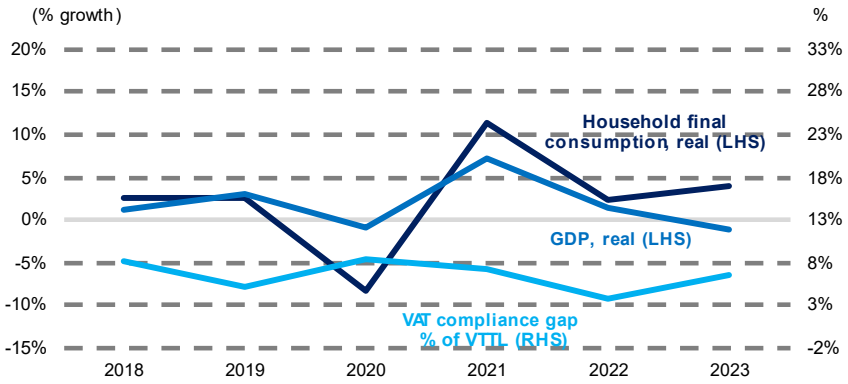
Highlights

- In 2022, the VAT policy gap remained stable, but its structure followed the pattern observed in many other countries, with an increasing rate gap and a decreasing exemption gap.
- Temporary measures introduced in the aftermath of the COVID-19 pandemic in 2021 were kept in place until the end of 2022. These measures included a reduced rate of 9% on catering services, cultural services, sports clubs, sports events, and other types of public events.

Luxembourg

VAT revenue in Luxembourg grew by 14.2% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap fluctuated between 2018 and 2020, before trending downwards to 2022** (Figure 80). Over this period Luxembourg's compliance gap had improved in 2021 and 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 80: LU: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, **the Luxembourg economy grew on average 2.1% annually between 2018 and 2019.** However, in 2020 the pandemic led to a 0.9% decline. This was driven by restrictions on movement and economic activity that constrained domestic demand, alongside supply chain disruptions. A strong recovery got underway in 2021, with GDP growth of 7.2% in 2021 and 1.4% in 2022. In nominal terms, GDP grew by 7.6% in 2022, supported by increased inflation driving up prices.

Luxembourg has a relatively low dependency on Russia for energy imports. Despite this, the economy was still affected by the impact of Russia's war of aggression against Ukraine on energy prices. The rise in energy prices contributed to an increase in the effective rate in Luxembourg due to energy being taxed higher than average standard rates. To mitigate the impact of rising energy costs, the government implemented energy price subsidies, VAT reductions for electricity and gas, grants for businesses, as well as public awareness campaigns to raise awareness about energy conservation practices. Despite these efforts, inflation rose to a high of 8.2% in 2022 but remained well below the EU27 average of 9.2%. Before this, inflation was stable at around 2% between 2018 and 2019, then inflation slowed in 2020 due to reduced demand. However, inflationary pressures began to rise sharply in 2021 as the economy reopened.

Despite rising inflation in 2022, real disposable income for consumers increased by 4.0%, fuelled by strong wage growth and a tight labour market. **This boost in income led to a moderate 2.3% growth in real household final consumption**, which in turn supported the expansion of the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 7.8%.

In 2022, **consumers and businesses resumed postponed investments**, triggering VAT receipts. Investments by the general government and households, the latter including non-profit institutions serving households, increased in 2022 by 7.9% and 22.1% respectively, contributing to higher VAT liabilities. Investments by financial institutions saw a significant growth of 57.1% in 2022. Meanwhile,

non-financial corporations experienced a 13.2% decline in investment growth; however, a significant portion of the VAT will be reclaimed by businesses, reducing its overall impact.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Luxembourg's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (34.3% growth) and recreational goods and services (13.1% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 8.7% in nominal terms.

The hospitality sector was one of the hardest hit by the pandemic, but it started to recover in 2022, with arrivals increasing by 64.7%. **By the end of 2022, levels had nearly returned to their pre-pandemic figures and were higher than the EU27 average.** As hospitality is a services sector, it has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, the industrial sector declined in 2022 by 10.6%, with levels below those recorded pre-pandemic due to the energy crisis.

In Luxembourg, **e-commerce growth fluctuated but typically increased between 2018 and 2022**, with online sales rising from 15.5% in 2018 to 26.3% of business turnover in 2022. Meanwhile, the share of businesses engaging in e-sales decreased from 16.2% to 12.2%. The growth in e-commerce has the potential to decrease non-compliance risks.

Unlike most other Member States, **bankruptcy declarations in Luxembourg declined by 10.5% in 2022, after increasing by 12.0% in 2021**. Luxembourg's robust economy and diversified financial sector have fostered a stable business environment, resulting in a historically low bankruptcy rate compared to other countries. However, the closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 54: LU: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	6.3%	0.5	Positive
Nominal household final consumption, restaurants & hotels	34.3%	30.7	Negative
Nominal household final consumption, custom services aggregate	20.7%	3.7	Negative
GDP, real	1.4%	-5.8	Positive
Total tourism arrivals	64.7%	47.6	Negative
Bankruptcy declarations	-10.5%	-22.5	Negative
E-commerce, % of sectors	-	0.2	Positive

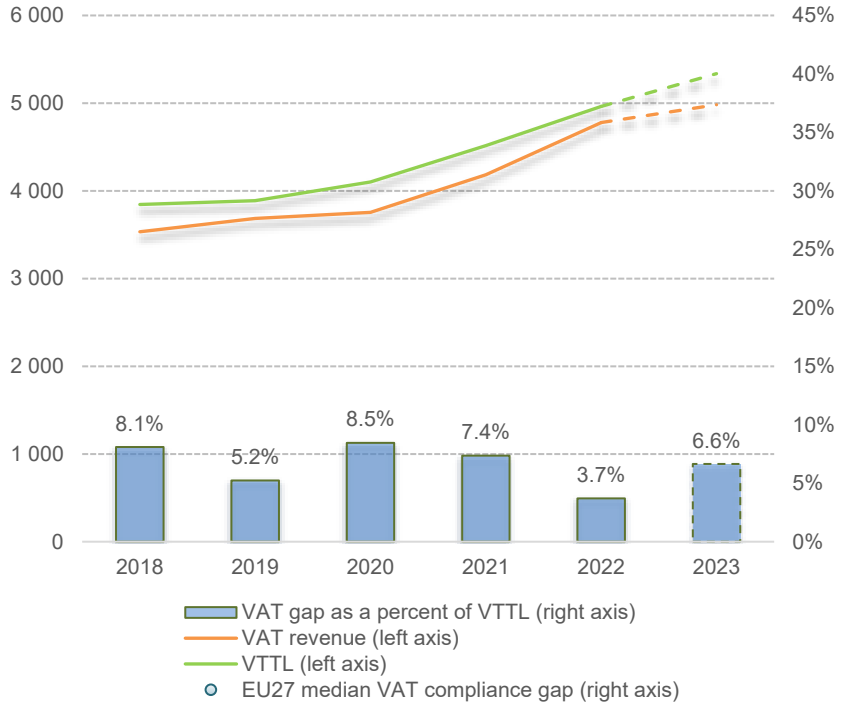
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 55: LU: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**3 845**	**3 889**	**4 102**	**4 515**	**4 963**	*5 337*
o/w liability on household final consumption	1 540	1 558	1 474	1 698	1 934	
o/w liability on gov. and NPISH final consumption	37	38	41	47	47	
o/w liability on intermediate consumption	1 384	1 471	1 581	1 659	1 741	
o/w liability on GFCF	565	462	724	664	763	
o/w net adjustments	319	360	281	447	478	
VAT revenue	**3 534**	**3 686**	**3 755**	**4 183**	**4 779**	*4 982*
VAT compliance gap	**311**	**203**	**347**	**332**	**184**	
VAT compliance gap (% of VTTL)	**8.1%**	**5.2%**	**8.5%**	**7.4%**	**3.7%**	*6.6%*
VAT compliance gap change since 2018					**-4.4 pp**	

Figure 81: LU: VAT compliance gap, VAT revenue, and VTTL[48]



Source: own calculation, download underlying data.

Highlights

- In 2022, the VAT compliance gap fell from 7.4% to 3.7% of the VTTL.
- Most of the parameters are slightly outdated, and the most recent use tables available are from 2020; Luxembourg was therefore assigned a yellow light, indicating some uncertainty regarding the accuracy of the VAT compliance gap estimates.

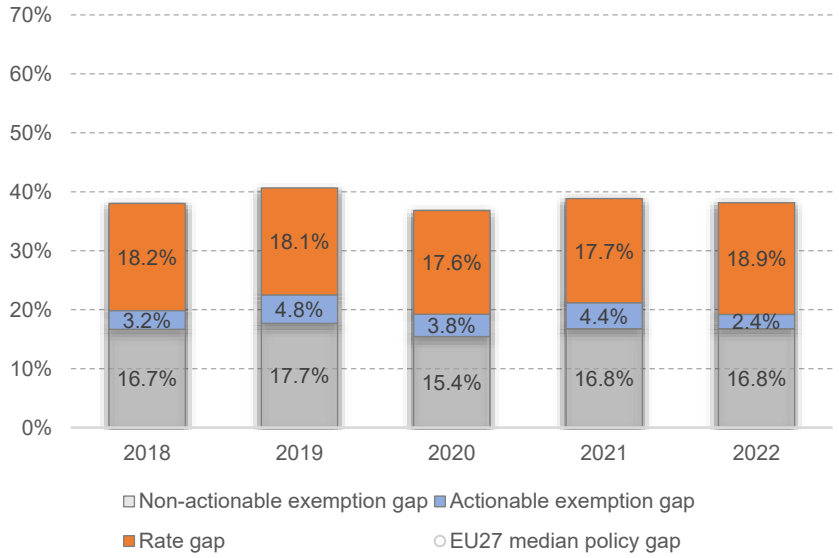
Assessed reliability of estimates:

[48] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 56: LU: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**2 357**	**2 663**	**2 389**	**2 867**	**3 059**
Exemption gap	1 232	1 475	1 247	1 563	1 540
o/w imputed rents	488	503	503	535	546
o/w public services	1 462	1 633	1 611	1 959	2 067
o/w financial services	*- 915*	*- 977*	*-1 112*	*-1 255*	*-1 268*
Rate gap	**1 126**	**1 188**	**1 142**	**1 304**	**1 519**
o/w agricultural products, foodstuffs, beverages	319	333	373	434	421
o/w pharmaceuticals	107	113	122	131	129
o/w transport services	162	171	171	198	208
o/w accommodation and restaurant services	274	293	225	251	305
o/w utilities	117	122	127	150	150
o/w other	147	155	124	141	305
Actionable policy gap	**1 323**	**1 504**	**1 387**	**1 628**	**1 714**
C-efficiency (%)	**73.0%**	**72.5%**	**74.3%**	**74.8%**	**79.3%**
Statutory standard VAT rate			**17%**		
Actionable standard VAT rate	**13.5%**	**12.8%**	**13.6%**	**13.1%**	**13.2%**

Figure 82: LU: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

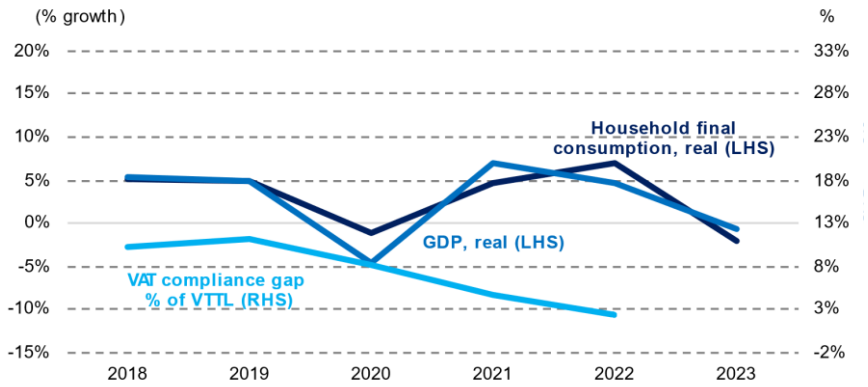
Highlights

- As a result of the low policy and compliance gaps, as well as a relatively large share of the VTTL generated through intermediate consumption liability, C-efficiency in Luxembourg was the highest in the EU, at 79% in 2022.
- In contrast to many other Member States, the actionable VAT policy gap in Luxembourg was greater than the non-actionable part of the VAT policy gap.

Hungary

VAT revenue in Hungary grew by 22.5% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap trended downward between 2018 and 2022 except for 2019** (Figure 83). Over this period Hungary's compliance gap improved in 2021 and 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 83: HU: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, Hungary's **economy grew at an average of 5% annually between 2018 and 2019.** However, in 2020 the pandemic led to a 4.7% decline, which was better than the EU27 average of 5.8%. This decline was mainly due to lockdowns, movement restrictions and global supply chain disruptions that severely impacted economic activity. A strong recovery began in 2021, with GDP growth of 7.0% in 2021 and 4.6% in 2022. In nominal terms, GDP increased by 19.5% in 2022, largely driven by rising inflation.

Hungary is one of the EU27 countries most heavily reliant on Russian energy. The economy was profoundly affected by the impact of Russia's war of aggression against Ukraine on energy prices. To alleviate the impact of rising energy costs, the government introduced price caps on electricity and gas, provided direct financial assistance to help households cover a portion of their energy bills and encouraged investment in renewables and energy efficiency through tax breaks and subsidies. Despite these measures, inflation soared to 15.3% in 2022, the highest level in decades and the fourth-highest rate among all Member States. Previously, inflation had remained stable at around 3% between 2018 and 2020. However, inflationary pressures began to escalate in 2021 as the economy reopened.

Despite rising inflation in 2022, **growth in consumers' real disposable incomes continued to rise, but at a slower rate of 1.6%** due to rising wages and a tight labour market, bolstering real household final consumption to grow strongly by 7.1%, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 23.3%.

In 2022, **consumers and businesses continued their postponed investments**, triggering VAT receipts. Investments by households, including by non-profit institutions serving households, increased in 2022 by 28.8%, contributing to higher VAT liabilities. Meanwhile, investments by the general government and financial institutions contracted by 5.8% and 0.7% respectively in 2022. Meanwhile, non-financial corporations saw sharp investment growth of 14.4%, but a large proportion of the corresponding output VAT will be reclaimed by businesses.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Hungary's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (42.6% growth) and transport services (18.5% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 10.2% in nominal terms.

In 2022, **the services sector exhibited faster growth compared to the industrial sector**, with real GVA increasing by 7.9% from 2021, and reaching levels 13.6% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, with arrivals increasing by 33.5%, although levels remain 24.7% below pre-pandemic levels. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, growth in the industrial sector increased by 1.8%, with growth slowing but remaining positive despite the ongoing energy crisis.

In Hungary, **e-commerce growth fluctuated but generally trended downwards between 2018 and 2022**, with online sales falling from 23.0% in 2018 to 19.5% of business turnover in 2022. Conversely, the share of businesses engaging in e-sales increased from 15.1% in 2018 to 21.9% in 2022. Meanwhile, online retail decreased from 6.7% in 2018 to 6.4% in 2022. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

Bankruptcy declarations in Hungary increased by 87.0% in 2022. The increase was largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 57: HU: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	6.6%	1.8	Positive
Nominal household final consumption, restaurants & hotels	42.6%	17.5	Negative
Nominal household final consumption, custom services aggregate	28.6%	7.7	Negative
GDP services, real	7.9%	-1.0	Negative
GDP, real	4.6%	-2.5	Positive
Total tourism arrivals	33.5%	19.7	Negative
Bankruptcy declarations	87.0%	-	Negative
E-commerce, % of sectors	-	1.5	Positive

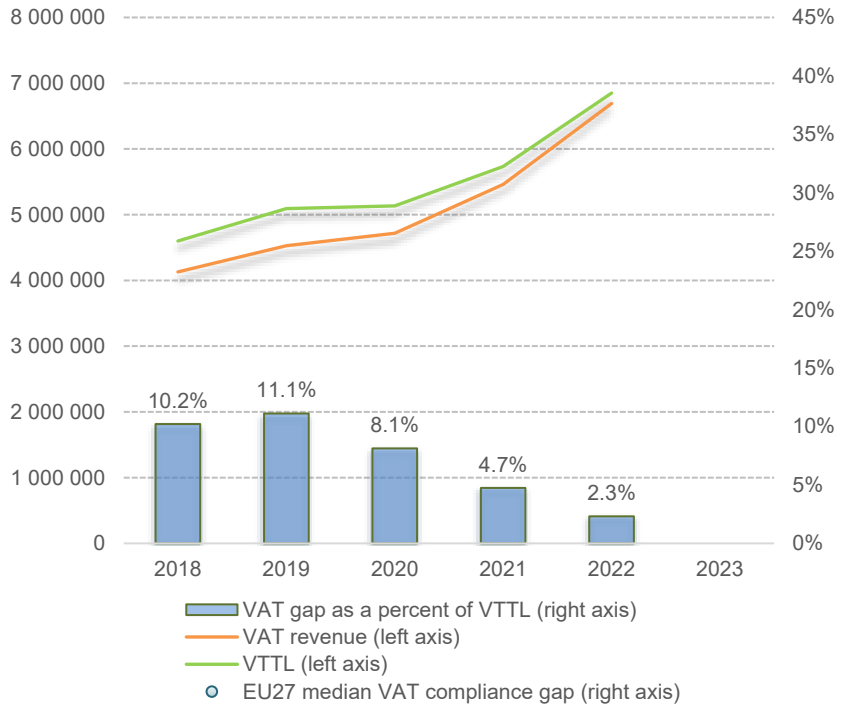
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 58: HU: VAT compliance gaps, VAT receipts, composition of VTTL (HUF million, 2018–2023)

	2018	2019	2020	2021	2022	2023
VTTL	**4 599 185**	**5 092 589**	**5 134 357**	**5 731 986**	**6 849 704**	*X*
o/w liability on household final consumption	3 042 548	3 300 236	3 148 107	3 535 757	4 260 951	
o/w liability on gov. and NPISH final consumption	150 996	197 738	256 799	262 170	290 450	
o/w liability on intermediate consumption	650 490	709 568	759 941	886 233	1 082 594	
o/w liability on GFCF	712 525	862 725	958 752	1 031 430	1 201 499	
o/w net adjustments	42 627	22 322	10 758	16 396	14 210	
VAT revenue	**4 129 537**	**4 526 757**	**4 717 048**	**5 460 243**	**6 691 200**	*X*
VAT compliance gap	**469 648**	**565 832**	**417 309**	**271 743**	**158 504**	
VAT compliance gap (% of VTTL)	**10.2%**	**11.1%**	**8.1%**	**4.7%**	**2.3%**	*X*
VAT compliance gap change since 2018					**-7.9 pp**	

Figure 84: HU: VAT compliance gap, VAT revenue, and VTTL[49]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap in Hungary has followed a steady and steep decline since 2019, reaching as low as 2.3% of the VAT Total Tax Liability (VTTL) in 2022. Overall, the change in the VAT compliance gap between 2019 and 2022 amounted to almost 10 percentage points.
- The preliminary estimates for Hungary for 2023 are not published in this report due to uncertainty regarding the effective rate calculation for this year.

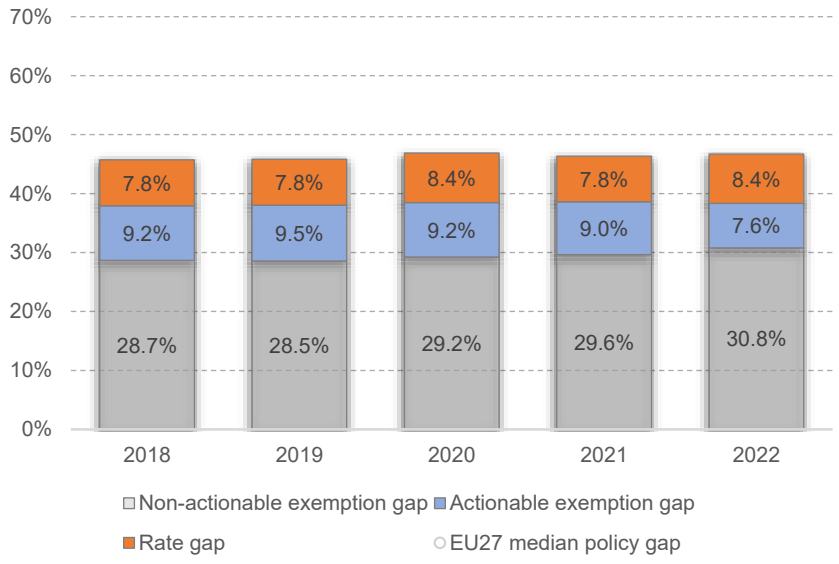
Assessed reliability of estimates:

[49] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 59: HU: VAT policy gap and its components (HUF million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**3 873 559**	**4 310 277**	**4 529 091**	**4 952 931**	**6 001 448**
Exemption gap	**3 212 444**	**3 577 394**	**3 718 360**	**4 124 245**	**4 928 119**
o/w imputed rents	728 190	850 106	903 973	1 051 123	1 383 493
o/w public services	1 441 030	1 543 649	1 602 982	1 765 673	2 048 058
o/w financial services	*260 887*	*290 661*	*318 015*	*350 524*	*523 775*
Rate gap	**661 115**	**732 883**	**810 731**	**828 686**	**1 073 329**
o/w agricultural products, foodstuffs, beverages	214 528	248 336	280 677	298 156	357 855
o/w pharmaceuticals	127 642	136 933	145 099	146 849	164 457
o/w transport services	35 382	38 254	24 269	26 194	47 002
o/w accommodation and restaurant services	184 730	195 683	214 420	217 268	319 137
o/w utilities	13 719	13 257	14 264	14 893	17 432
o/w other	85 114	100 419	132 003	125 327	167 445
Actionable policy gap	**1 443 452**	**1 625 860**	**1 704 120**	**1 785 611**	**2 046 122**
C-efficiency (%)	**56.8%**	**56.2%**	**57.9%**	**60.4%**	**61.3%**
Statutory standard VAT rate			**27%**		
Actionable standard VAT rate	**21.9%**	**21.9%**	**21.6%**	**21.8%**	**21.6%**

Figure 85: HU: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

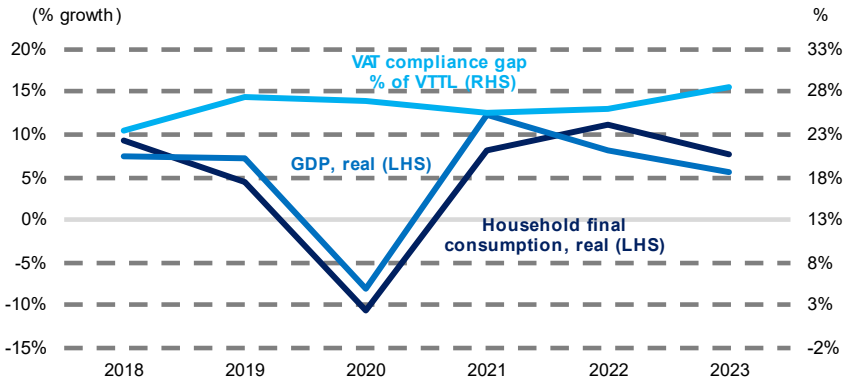
Highlights

- The VAT policy gap and its structure remained relatively stable compared to other Member States and to the VAT compliance gap.
- In contrast to most Member States, the non-actionable VAT exemption gap increased in 2023.

Malta

VAT revenue in Malta grew by 18.9% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, the **VAT compliance gap widened in 2019 before declining steadily until 2021**, where it then remained relatively stable in 2022 (Figure 86). Over this period, Malta's compliance gap improved in 2021 and remained stable in 2022, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 86: MT: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, **Malta's economy grew at an average of 7% annually between 2018 and 2019.** However, in 2020 the pandemic led to an 8.1% decline, one of the biggest declines across the Member States and well above the EU27 average of 5.8%. The more significant decline was a result of Malta's dependence on tourism, which collapsed in 2020 due to lockdowns and movement restrictions that severely hindered economic activity. A strong recovery began in 2021, with GDP growth of 12.4% and 8.1% in 2022. In nominal terms, GDP increased by 13.8% in 2022, largely driven by rising inflation.

Malta is not heavily reliant on Russian energy, although the country imports almost all its energy needs. As a result, the economy was indirectly affected by Russia's war of aggression against Ukraine through the fluctuation in global energy markets. To alleviate the impact of rising energy costs, the government implemented several measures, including freezing electricity and water tariffs for households and businesses, subsidised energy costs, alongside the promotion of renewables and encouraging energy efficiency. Despite these efforts, inflation rose to 6.1% in 2022, the second lowest inflation rate across all Member States and well below the EU27 average of 9.2%. Previously, inflation had remained stable below 2% between 2018 and 2019 before slowing and remaining low in 2020 and 2021 due to reduced demand.

Despite rising inflation in 2022, **growth in consumers' real disposable incomes continued to rise at a robust rate of 4.5%** due to the government freezing energy prices, a strong labour market, and wage growth boosting household incomes. Robust income growth fuelled a substantial 11.0% increase in real household final consumption in 2022, which in turn bolstered the growth of the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 16.9%.

In 2022, **consumers and businesses resumed their postponed investments**, triggering VAT receipts. Investments by the general government contracted in 2022 by 0.7% due to the easing of government support. Meanwhile, non-financial corporations saw significant investment growth of 68.9%,

but a large proportion of the VAT will be reclaimed by businesses. It is important to highlight that comprehensive data on the level of investment by all institutions in Malta is limited.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Malta's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (83.3% growth) and recreational goods and services (48.8% growth).** Since services are harder to tax effectively than traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 4.1% in nominal terms.

The hospitality sector was severely impacted by the pandemic, **with Malta experiencing one of the steepest declines in tourism arrivals across Member States in 2020**. The sector began to recover in 2021, and arrivals surged by 150.1% in 2022. Nevertheless, despite this strong growth in 2021 and 2022, tourism levels remained 21.1% below pre-pandemic figures. As hospitality is a services sector it has a **higher risk of non-compliance due to its diversity and the intangibility of services**. In contrast to many other Member States, the industrial sector saw a notable 8.4% growth during the energy crisis, largely driven by the electronics sector as demand for microchips increased significantly in the aftermath of the pandemic.

In Malta, **e-commerce growth generally trended upward from 2017 to 2022**, with online sales increasing from 11.8% in 2017 to 13.0% of business turnover in 2022. Meanwhile, the share of businesses engaging in e-sales increased from 18.0% in 2017 to 32.1% in 2022. Moreover, online retail sales increased from 4.9% in 2017 to 6.2% in 2022. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

In contrast to many other Member States, **bankruptcy declarations in Malta decreased by 25.0% in 2022** after increasing by 33.3% in 2021. The improvement in 2022 was driven by financial assistance and energy price stabilisation that protected businesses during the energy crisis that other Member States didn't have. The government support measures helped prevent the closure of many firms and contributed to improved VAT compliance and collections.

Table 60: MT: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	18.4%	13.5	Positive
Nominal household final consumption, restaurants & hotels	83.3%	33.4	Negative
Nominal household final consumption, custom services aggregate	68.4%	32.3	Negative
GDP, real	8.1%	-4.3	Positive
Total tourism arrivals	150.1%	95.5	Negative
Bankruptcy declarations	-25.0%	-58.3	Negative
E-commerce, % of sectors	-	2.9	Positive

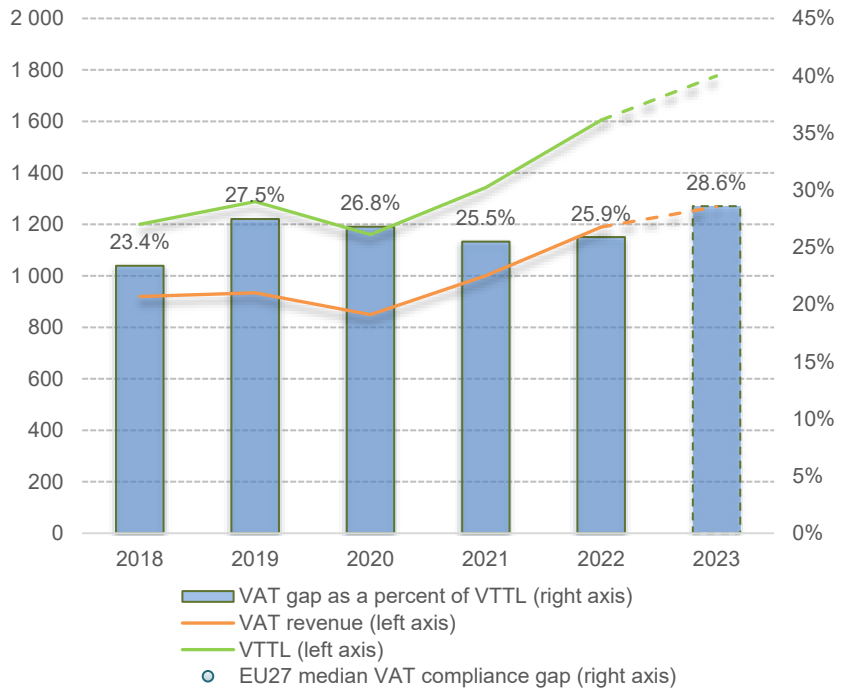
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 61: MT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**1 200**	**1 288**	**1 160**	**1 343**	**1 605**	*1 777*
o/w liability on household final consumption	633	656	468	548	731	
o/w liability on gov. and NPISH final consumption	57	64	75	82	84	
o/w liability on intermediate consumption	387	449	504	573	626	
o/w liability on GFCF	102	110	106	126	148	
o/w net adjustments	22	9	8	14	17	
VAT revenue	**920**	**934**	**849**	**1 001**	**1 190**	*1 269*
VAT compliance gap	**281**	**354**	**311**	**342**	**415**	
VAT compliance gap (percent of VTTL)	**23.4%**	**27.5%**	**26.8%**	**25.5%**	**25.9%**	*28.6%*
VAT compliance gap change since 2018					**+2.5 pp**	

Figure 87: MT: VAT compliance gap, VAT revenue, and VTTL[50]



Highlights

- After a large increase in the VAT compliance gap in 2019, the gap has been steadily decreasing, reaching 25.5% of the VTTL in 2021 and 25.9% in 2022.
- According to preliminary estimates, the VAT compliance gap in 2023 deteriorated.
- The latest use tables are available for 2018; thus, Malta was assigned a yellow light, indicating some uncertainty regarding the accuracy of the estimates.

Source: own calculation, download underlying data.

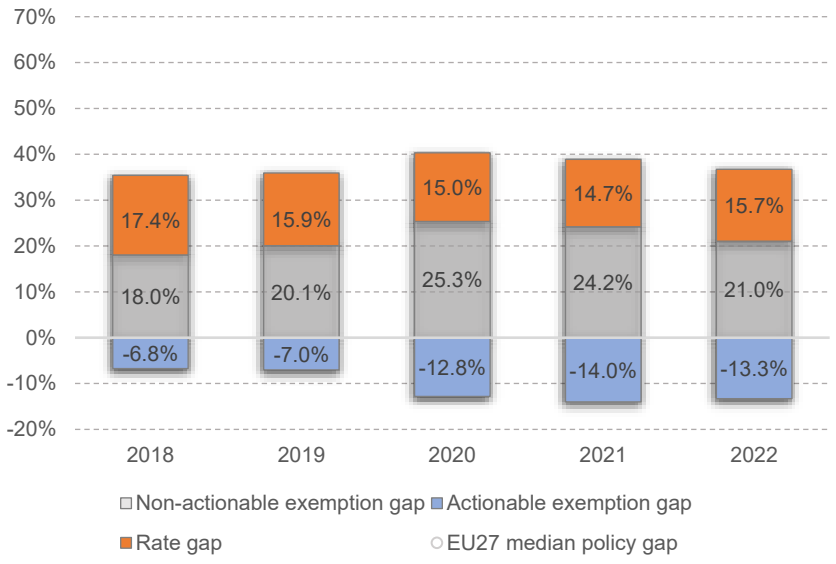
Assessed reliability of estimates:

[50] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 62: MT: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**482**	**524**	**440**	**446**	**492**
Exemption gap	**190**	**236**	**201**	**183**	**163**
o/w imputed rents	84	87	99	99	114
o/w public services	201	237	273	292	295
o/w financial services	*19*	*39*	*33*	*42*	*32*
Rate gap	**292**	**287**	**240**	**263**	**329**
o/w agricultural products, foodstuffs, beverages	137	138	144	153	181
o/w pharmaceuticals	22	1	2	2	2
o/w transport services	34	39	17	23	36
o/w accommodation and restaurant services	61	62	23	25	47
o/w utilities	12	14	14	16	18
o/w other	27	34	39	42	44
Actionable policy gap	**179**	**160**	**35**	**13**	**50**
C-efficiency (%)	**61.8%**	**57.9%**	**60.5%**	**64.0%**	**64.1%**
Statutory standard VAT rate			**18%**		
Actionable standard VAT rate	**15.7%**	**16.1%**	**17.3%**	**17.6%**	**17.3%**

Figure 88: MT: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

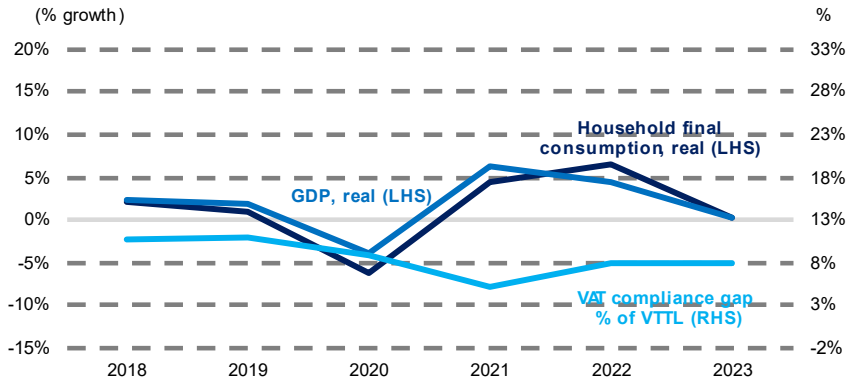
Highlights

- C-efficiency in Malta was high (approximately 64% in 2021) and substantially above the EU average. This was largely due to the relatively low VAT policy gap, which was primarily driven by the significant role of the gambling sector providing electronic services abroad and the lack of a right to deduct input VAT for these providers. As a result, large sums of hidden tax created a negative actionable exemption gap and increased overall VAT revenue compared to a scenario assuming the taxability of output and the deductibility of intermediate inputs.

Netherlands

VAT revenue in the Netherlands grew by 6.9% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). Meanwhile, **the VAT compliance gap trended downward between 2018 and 2021, before increasing again in 2022** (Figure 89). Over this period, the Dutch compliance gap was the lowest in 2021, with real GDP and household final consumption rebounding strongly following the pandemic.

Figure 89: NL: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, t**he Dutch economy grew at an average rate of 2% annually between 2018 and 2019.** However, in 2020 the pandemic caused a 3.9% decline, although this was better than the EU27 average of 5.8%. The decline in the Netherlands was primarily due to lockdowns, movement restrictions, and global supply chain disruptions that adversely affected economic activity. A robust recovery started in 2021, with GDP growth of 6.2%, followed by 4.4% growth in 2022. In nominal terms, GDP rose by 10.2% in 2022, largely driven by increasing inflation.

The Dutch economy has some reliance on Russian energy, but it is less dependent than several other EU27 countries. Despite this, the economy was still affected by the impact of Russia's war of aggression against Ukraine on energy prices. To alleviate the impact of rising energy costs, the Dutch government introduced price caps on electricity and gas, temporary VAT reductions on electricity and natural gas, a one-time energy allowance, temporary reductions in income tax, an energy compensation scheme for businesses and tax breaks to encourage investments in energy efficiency and renewables. Despite these efforts, inflation surged to 11.6% in 2022, well above the EU27 average of 9.2% and reaching the highest level in decades. Previously, inflation had remained stable at around 2% between 2018 and 2019, before slowing in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

Despite rising inflation in 2022, **real disposable income for consumers grew steadily by 2.1%**, driven by the robust Dutch labour market, which drove wage increases and higher employment rates. Additionally, real household final consumption grew strongly by 6.5%, driven by pent-up demand from the easing of pandemic restrictions. These measures provided some cushion for consumers, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 13.9%.

In 2022, **consumers and businesses resumed their postponed investments**, triggering VAT receipts. Investments by the general government and households, the latter including non-profit

institutions serving households, increased in 2022 by 1.2% and 10.6% respectively, contributing to higher VAT liabilities. Additionally, investments by financial institutions increased by 3.6% in 2022. Meanwhile, non-financial corporations saw strong investment growth of 9.6%, but a large proportion of the corresponding output VAT will be reclaimed by businesses.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, the Dutch nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (59.9% growth) and recreational goods and services (24.1% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 13.5% in nominal terms.

In 2022, **the services sector exhibited faster growth compared to the industrial sector**, with real GVA increasing by 5.4% from 2021, and reaching levels 7.0% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, with arrivals increasing by 157.1% in 2022. Despite this, levels remain 20.2% below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, growth in the industrial sector increased by 3.3%, with growth slowing but remaining positive despite the ongoing energy crisis.

In the Netherlands, **e-commerce growth generally trended upwards between 2018 and 2022**, with online sales rising from 14.5% in 2018 to 19.9% of business turnover in 2022. The share of businesses engaging in e-sales increased from 27.3% in 2018 to 30.6% in 2022. Moreover, online retail sales increased from 7.3% in 2018 to 12.1% in 2022. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

Bankruptcy declarations in the Netherlands increased by 18.0% in 2022. The increase was largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 63: NL: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	4.6%	2.4	Positive
Nominal household final consumption, restaurants & hotels	59.9%	46.3	Negative
Nominal household final consumption, custom services aggregate	46.1%	36.1	Negative
GDP services, real	5.4%	-1.1	Negative
GDP, real	4.4%	-1.8	Positive
Total tourism arrivals	157.1%	171.1	Negative
Bankruptcy declarations	18.0%	61.3	Negative
E-commerce, % of sectors	-	2.6	Positive

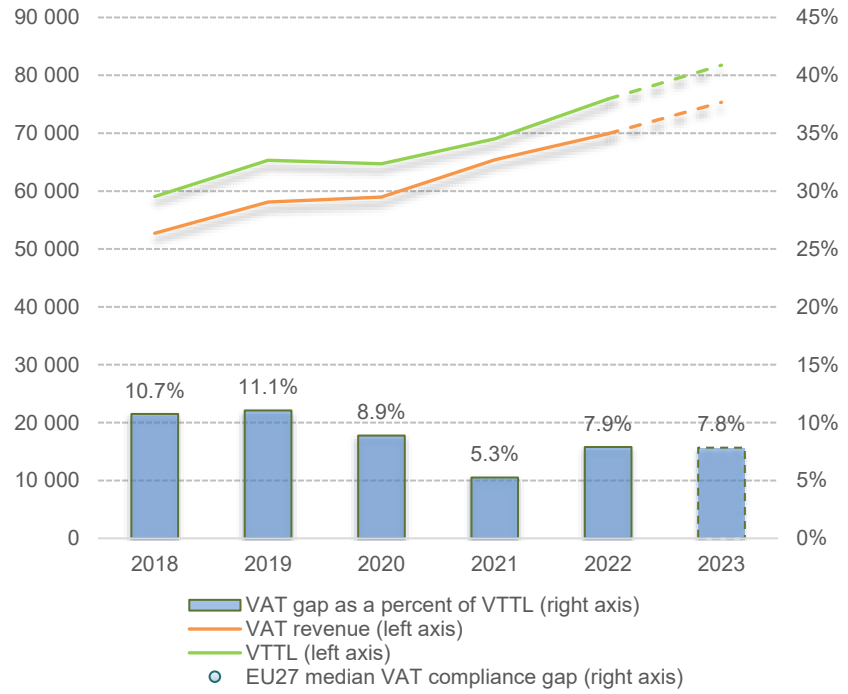
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 64: NL: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**59 060**	**65 337**	**64 720**	**69 024**	**75 919**	*81 754*
o/w liability on household final consumption	30 541	33 955	32 529	35 451	40 077	
o/w liability on gov. and NPISH final consumption	489	713	700	763	831	
o/w liability on intermediate consumption	16 346	17 652	18 177	18 873	19 675	
o/w liability on GFCF	11 272	12 533	12 921	13 542	14 836	
o/w net adjustments	411	484	394	395	500	
VAT revenue	**52 712**	**58 115**	**58 971**	**65 400**	**69 928**	*75 349*
VAT compliance gap	**6 348**	**7 222**	**5 749**	**3 624**	**5 991**	
VAT compliance gap (% of VTTL)	**10.7%**	**11.1%**	**8.9%**	**5.3%**	**7.9%**	*7.8%*
VAT compliance gap change since 2018					**-2.9 pp**	

Figure 90: NL: VAT compliance gap, VAT revenue, and VTTL[51]



Highlights

- In 2022, the VAT compliance gap in the Netherlands increased by 2.6 percentage points, reaching 7.9% of the VAT Total Tax Liability (VTTL).
- The VAT compliance gap is expected to have remained broadly unchanged in 2023.
- Compared to edition 2023 of the VAT gap report, the estimates of the VAT compliance gap were revised upward by nearly 5 percentage points, resulting from a significant revision of national accounts figures.

Source: own calculation, download underlying data.

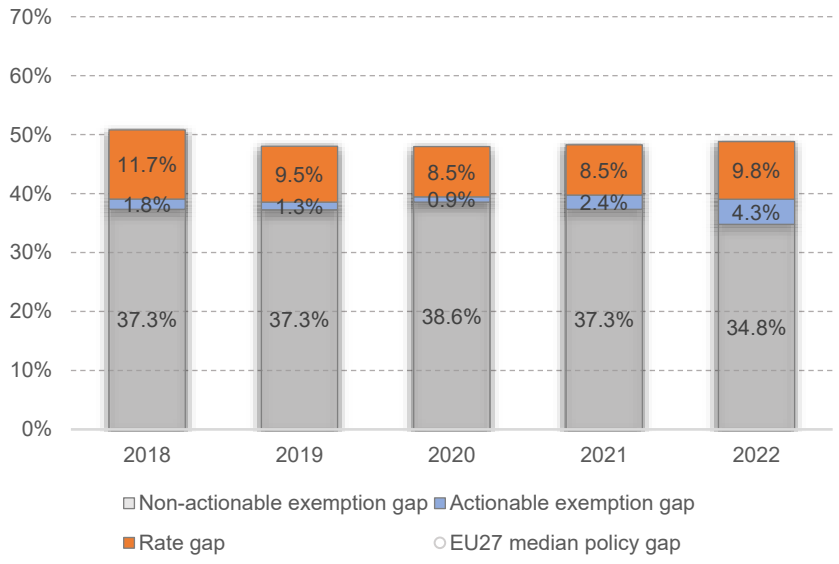
Assessed reliability of estimates:

[51] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 65: NL: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**60 943**	**60 343**	**59 672**	**64 443**	**72 411**
Exemption gap	**46 895**	**48 446**	**49 061**	**53 036**	**57 912**
o/w imputed rents	8 461	8 815	9 258	8 625	9 214
o/w public services	30 137	31 572	32 120	33 324	35 728
o/w financial services	*6 191*	*6 436*	*6 589*	*7 888*	*6 664*
Rate gap	**14 048**	**11 897**	**10 610**	**11 407**	**14 499**
o/w agricultural products, foodstuffs, beverages	5 961	4 823	5 406	5 350	5 681
o/w pharmaceuticals	705	536	611	576	634
o/w transport services	1 192	1 101	640	775	1 243
o/w accommodation and restaurant services	3 336	2 758	1 900	2 066	3 311
o/w utilities	1 012	1 023	1 117	1 399	2 012
o/w other	1 840	1 656	937	1 242	1 618
Actionable policy gap	**16 153**	**13 520**	**11 706**	**14 606**	**20 806**
C-efficiency (%)	**50.7%**	**53.7%**	**55.5%**	**57.2%**	**54.8%**
Statutory standard VAT rate			**21%**		
Actionable standard VAT rate	**15.9%**	**16.8%**	**17.0%**	**16.3%**	**16.0%**

Figure 91: NL: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

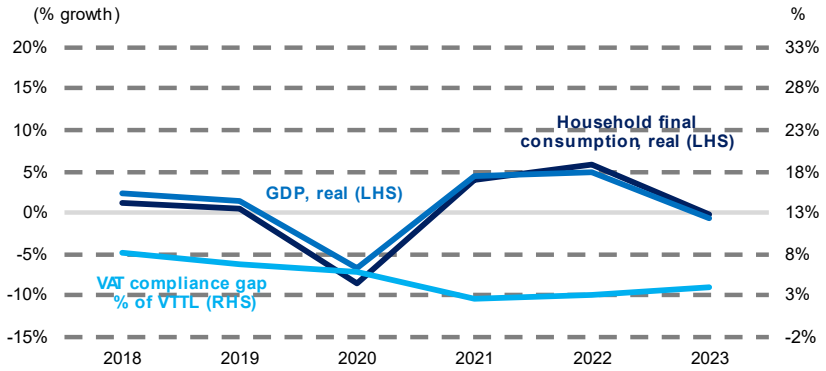
Highlights

- In 2022, the VAT policy gap remained stable, but its structure followed the pattern observed in many other countries, with an increasing VAT rate gap and a decreasing VAT exemption gap.
- From October 2021, a number of COVID-19 measures (VAT exemption for the provision of healthcare staff, reduced rate for online sports courses, zero rate for face masks, zero rate for COVID-19 vaccines, and COVID-19 tests) were no longer applicable, which affected the change in the policy gap and its structure between 2021 and 2022.

Austria

VAT revenue in Austria grew by 15.9% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and 2022 (Annex F). **Meanwhile, the VAT compliance gap significantly improved from 2018 to 2021 and remained low in 2022** (Figure 92). During this period, Austria's compliance gap significantly improved in 2021 and remained stable in 2022, as real GDP and household final consumption rebounded strongly after the pandemic.

Figure 92: AT: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, Austria's **economy grew at an average of 2% annually between 2018 and 2019.** However, in 2020 the pandemic led to a significant 6.7% decline, worse than the EU27 average of 5.8%. This large downturn was driven by Austria's reliance on tourism, stringent lockdowns, and the impact of global supply chain disruptions on the manufacturing sector, compounded by the limitations of a smaller domestic market. A recovery followed in 2021, with GDP growth of 4.4% and 4.8% in 2022, fuelled by a rebound in tourism, manufacturing, and services. In nominal terms, GDP increased by 10.4% in 2022, largely driven by rising inflation.

Austria imports a significant proportion of its energy needs, with Russia its primary supplier of natural gas for many years. As a result, the economy was profoundly affected by the impact of Russia's war of aggression against Ukraine on energy prices. To alleviate rising energy costs, the government implemented electricity price caps for households and small businesses, provided direct financial aid to low-income households, issued a one-time "climate and anti-inflation" bonus to residents, introduced subsidies for energy-intensive industries and SMEs, and reduced taxes on energy. Despite these efforts, inflation rose to 8.6% in 2022, marking the highest level in decades, though it stayed below the EU27 average of 9.2%. Prior to this, inflation had remained stable at around 2% between 2018 and 2019, before dipping slightly in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

Despite inflation rising in 2022, **real disposable income growth remained strong at 3.4%**, supported by government measures against high energy prices, robust wage growth, temporary tax reductions, and pension adjustments. Consequently, real household final consumption grew strongly by 5.8%, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 13.6%.

In 2022, **consumers and businesses resumed their postponed investments**, triggering VAT receipts. Investments by the general government and by households, the latter including non-profit institutions serving households, increased in 2022 by 5.0% and 10.5% respectively, contributing to higher VAT liabilities. Additionally, investments by financial institutions increased by 9.7% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Austria's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (63.2% growth) and recreational goods and services (27.5% growth).** Since services are harder to tax effectively than traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 5.8% in nominal terms.

In 2022, **the services sector grew faster than the industrial sector**, with real GVA increasing by 6.1%. This was largely due to a catch-up effect, with services only returning to pre-pandemic levels in 2022. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, with arrivals increasing by 106.0% in 2022. Despite this, levels remained 17.8% below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, growth in the industrial sector increased by 4.3%, with growth remaining stable despite the ongoing energy crisis.

In Austria, **e-commerce growth increased between 2018 to 2021, before slowing in 2022**. Online sales rose from 13.7% in 2018 to 16.7% of business turnover in 2021, before slowing to 15.1% in 2022. The share of businesses engaging in e-sales increased from 18.4% in 2018 to 29.7% in 2021, before slowing to 26.4% in 2022. Moreover, online retail sales increased from 3.4% in 2018 to 4.9% in 2022. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

Bankruptcy declarations in Austria increased by 57.5% in 2022. The increase was largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 66: AT: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	7.2%	8.9	Positive
Nominal household final consumption, restaurants & hotels	63.2%	69.8	Negative
Nominal household final consumption, custom services aggregate	51.1%	54.3	Negative
GDP services, real	6.1%	4.7	Negative
GDP, real	4.8%	0.5	Positive
Total tourism arrivals	106.0%	121.6	Negative
Bankruptcy declarations	57.5%	57.4	Negative
E-commerce, % of sectors	-	-3.3	Positive

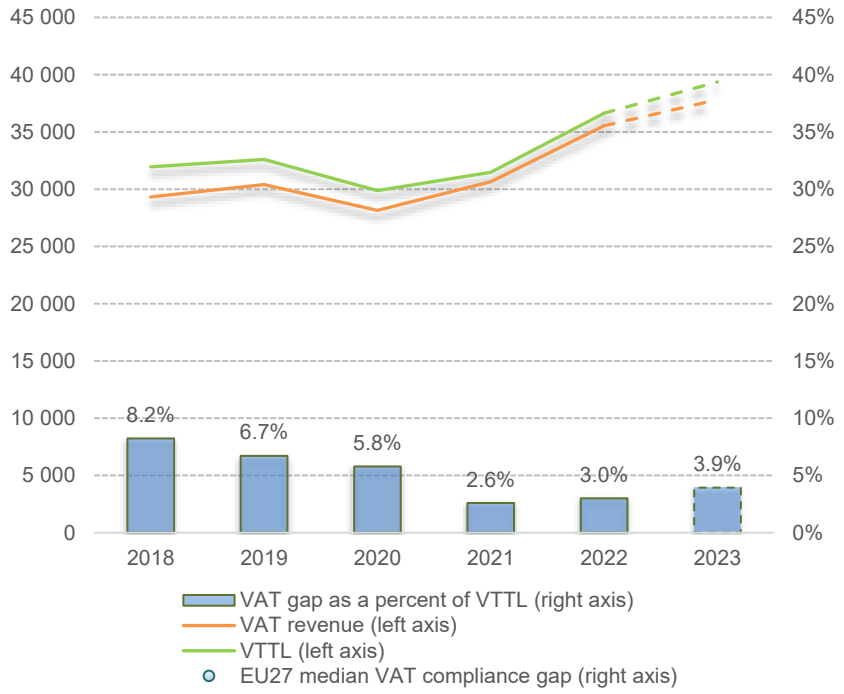
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 67: AT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**31 954**	**32 594**	**29 877**	**31 473**	**36 643**	*39 371*
o/w liability on household final consumption	21 358	21 789	18 965	19 128	23 296	
o/w liability on gov. and NPISH final consumption	1 486	1 533	1 587	1 738	1 854	
o/w liability on intermediate consumption	4 385	4 574	4 637	5 387	5 772	
o/w liability on GFCF	3 416	3 524	3 611	3 851	4 163	
o/w net adjustments	1 310	1 175	1 077	1 369	1 558	
VAT revenue	**29 323**	**30 405**	**28 149**	**30 657**	**35 543**	*37 821*
VAT compliance gap	**2 631**	**2 188**	**1 728**	**817**	**1 101**	
VAT compliance gap (% of VTTL)	**8.2%**	**6.7%**	**5.8%**	**2.6%**	**3.0%**	*3.9%*
VAT compliance gap change since 2018					**-5.2 pp**	

Figure 93: AT: VAT compliance gap, VAT revenue, and VTTL[52]



Highlights

- Since 2018, the VAT compliance gap has followed a downward trend, reaching as low as 2.6% of the VTTL in 2021.
- In 2022, the VAT compliance gap was estimated to have increased by 0.4 percentage points, and it is projected to have increased further in 2023.
- Most of the parameters are slightly outdated, with the most recent use tables available for 2020; Austria was therefore assigned a yellow light, indicating some uncertainty regarding the accuracy of the estimates.

Source: own calculation, download underlying data.

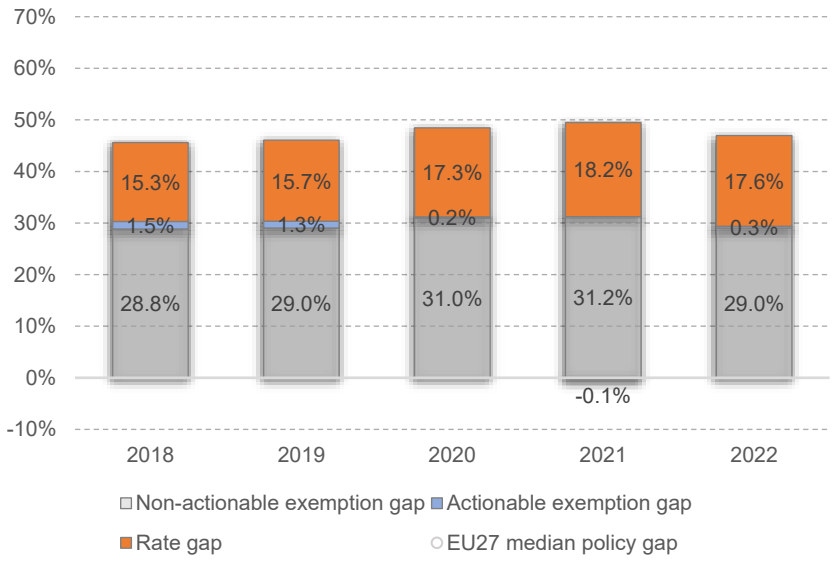
Assessed reliability of estimates:

[52] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 68: AT: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**26 777**	**27 844**	**28 072**	**30 716**	**32 453**
Exemption gap	**17 803**	**18 355**	**18 076**	**19 371**	**20 291**
o/w imputed rents	4 377	4 494	4 690	4 773	4 937
o/w public services	11 038	11 459	11 740	13 033	13 426
o/w financial services	*1 521*	*1 598*	*1 512*	*1 620*	*1 701*
Rate gap	**8 974**	**9 490**	**9 996**	**11 345**	**12 162**
o/w agricultural products, foodstuffs, beverages	1 774	1 835	1 968	1 975	2 082
o/w pharmaceuticals	350	364	374	415	430
o/w transport services	949	967	657	718	946
o/w accommodation and restaurant services	1 472	1 544	1 898	2 595	2 889
o/w utilities	0	0	0	0	0
o/w other	4 429	4 780	5 099	5 643	5 816
Actionable policy gap	**9 841**	**10 293**	**10 130**	**11 291**	**12 389**
C-efficiency (%)	**57.9%**	**58.5%**	**56.6%**	**58.1%**	**60.3%**
Statutory standard VAT rate			**20%**		
Actionable standard VAT rate	**15.7%**	**15.5%**	**15.1%**	**14.8%**	**15.0%**

Figure 94: AT: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

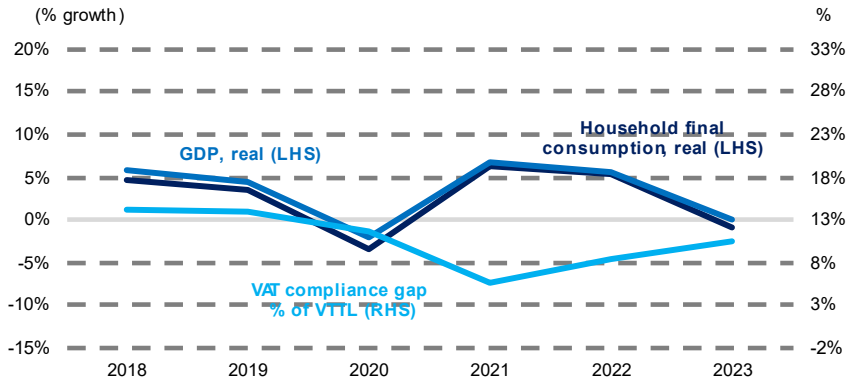
Highlights

- Significant changes to the 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% to 10%) as well as for hospitality and selected cultural services (from 10% to 5%). As a consequence, the VAT rate gap in 2021 was above the level observed before 2020.

Poland

Poland is the only Member State where VAT revenue in 2022 declined by 0.8%, despite growth in key macroeconomic indicators such as GDP and household final consumption increasing robustly in 2021 and 2022 (Annex F). **Meanwhile, the VAT compliance gap significantly improved between 2018 and 2021, but increased again in 2022** (Figure 95). Poland's compliance gap reached its lowest level in 2021 during this period, as real GDP and household final consumption rebounded strongly following the pandemic.

Figure 95: PL: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, **Poland's GDP showed robust performance, with annual growth averaging 5% between 2018 and 2019.** However, in 2020 the pandemic led to a 2.0% decline, much better than the EU27 average of 5.8%. The downturn was caused by restrictions on movement and disruptions to economic activity. A strong recovery followed in 2021, with GDP growth of 6.9% and 5.5% in 2022. This recovery was driven by the reopening of the economy, increased domestic demand, EU recovery funds and robust export growth, along with a strong rebound in the manufacturing and industrial sectors. In nominal terms, GDP increased by 16.7% in 2022, largely driven by rising inflation.

Poland is quite reliant on Russian energy, particularly natural gas and oil. Although the country has made significant strides in reducing its dependence in recent years, the economy was profoundly affected by the impact of Russia's war of aggression against Ukraine on energy prices. In response to rising energy costs, a combination of strategies was implemented to ensure energy security and provide relief to consumers. These measures included constructing new pipelines to diversify energy sources, the temporary lowering of VAT rates for electricity and gas to 5% and 0% respectively during part of 2022, price limits on electricity and gas, and direct financial assistance offered to vulnerable households and small businesses. Despite these efforts, inflation rose to its highest level since 1997 and was one of the highest rates across Member States, reaching 13.2% in 2022. Before this, inflation had remained stable at around 2% between 2018 and 2019. However, **unlike most Member States inflation started to increase in 2020**, despite the pandemic.

With inflation rising in 2022, **real disposable income growth was weak at 0.2%**. Despite this, real household final consumption grew strongly by 5.4%, driven by pent-up demand and the use of excess savings accumulated during the pandemic, which would support growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 20.2%.

In 2022, **consumers and businesses proceeded with their postponed investments**, triggering VAT receipts. Investments by the general government and households, the latter including non-profit institutions serving households, increased in 2022 by 12.7% and 6.9% respectively, contributing to higher VAT liabilities. Additionally, investments by financial institutions increased by 27.7% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Poland's strongest-performing household final consumption categories varied across goods and services, unlike the trend seen at the EU27 level. The sectors with the strongest increase in spending in 2022 were **other goods and services (27.2% growth) and restaurants and hotels (22.2% growth).** More growth in service sectors can lead to a **higher risk of non-compliance** as services are harder to tax effectively than traditional goods. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 9.5% in nominal terms.

In 2022, **the industrial sector grew faster than the services sector**, with real GVA increasing by 8.0%. This was largely due to a catch-up effect, with industry GVA only returning to pre-pandemic levels in 2022. Meanwhile, **growth in the services sector increased by 4.8%**, with levels 13.1% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, with arrivals increasing by 40.7% in 2022. Despite this, levels remained 18.9% below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services.

In Poland, **e-commerce growth fluctuated but trended upward between 2018 and 2022**, with online sales rising from 14.9% in 2018 to 16.8% of business turnover in 2022. The share of businesses engaging in e-sales increased from 14.0% in 2018 to 17.0% in 2022. Moreover, online retail sales increased from 5.6% in 2018 to 6.2% in 2022. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

Bankruptcy declarations in Poland decreased by 6.9% in 2022, continuing the trend observed from 2019. Declarations remain low as the government continues to provide financial assistance and subsidies to businesses affected by rising energy costs which is helping firms stay afloat, but this trend will reverse when support is phased out. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 69: PL: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	15.1%	9.3	Positive
Nominal household final consumption, restaurants & hotels	22.2%	-5.2	Negative
Nominal household final consumption, custom services aggregate	18.3%	1.7	Negative
GDP services, real	4.8%	-4.9	Negative
GDP, real	5.5%	-1.3	Positive
Total tourism arrivals	40.7%	40.8	Negative
Bankruptcy declarations	-6.9%	22.4	Negative
E-commerce, % of sectors	-	-1.0	Positive

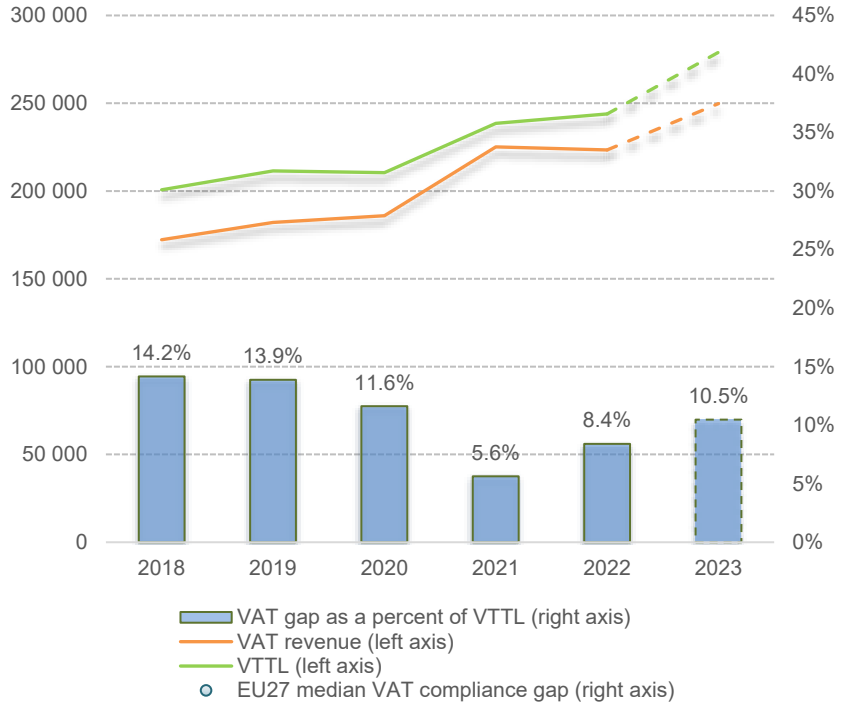
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 70: PL: VAT compliance gaps, VAT receipts, composition of VTTL (PLN million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**200 696**	**211 505**	**210 433**	**238 576**	**243 893**	*279 035*
o/w liability on household final consumption	137 550	145 980	144 747	164 895	163 047	
o/w liability on gov. and NPISH final consumption	8 343	9 000	9 541	11 028	12 355	
o/w liability on intermediate consumption	31 539	32 852	31 742	36 924	38 320	
o/w liability on GFCF	20 559	20 912	21 648	22 615	26 141	
o/w net adjustments	2 705	2 761	2 756	3 114	4 030	
VAT revenue	**172 264**	**182 147**	**185 964**	**225 140**	**223 395**	*249 805*
VAT compliance gap	**28 432**	**29 358**	**24 469**	**13 436**	**20 498**	
VAT compliance gap (% of VTTL)	**14.2%**	**13.9%**	**11.6%**	**5.6%**	**8.4%**	*10.5%*
VAT compliance gap change since 2018					**-5.8 pp**	

Figure 96: PL: VAT compliance gap, VAT revenue, and VTTL[53]



Source: own calculation, download underlying data.

Highlights

- After falling below the average EU value and reaching as low as 5.6% in 2021, the VAT compliance gap increased in 2022 and is expected to have increased by an additional 2 percentage points in 2023.
- Most of the parameters are slightly outdated, with the most recent use tables available for 2020; Poland was therefore assigned a yellow light, indicating some uncertainty around the accuracy of the estimates.
- The estimates of the VTTL for 2021 were revised upwards compared to the 2023 Study due to the revision of national accounts for this period.

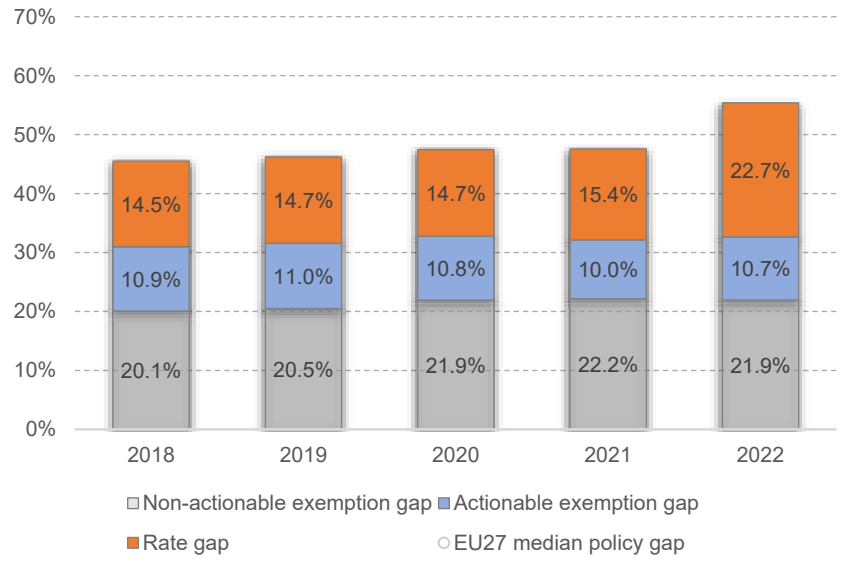
Assessed reliability of estimates:

[53] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 71: PL: VAT policy gap and its components (PLN million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**167 476**	**181 640**	**189 985**	**216 448**	**302 773**
Exemption gap	**114 085**	**124 034**	**131 138**	**146 280**	**178 600**
o/w imputed rents	12 745	13 275	13 688	14 817	16 224
o/w public services	50 321	56 175	61 894	73 540	83 831
o/w financial services	*10 808*	*11 181*	*12 193*	*12 455*	*19 801*
Rate gap	**53 391**	**57 606**	**58 847**	**70 168**	**124 173**
o/w agricultural products, foodstuffs, beverages	26 965	28 043	30 825	35 798	66 811
o/w pharmaceuticals	4 311	4 603	4 683	6 223	7 351
o/w transport services	2 642	2 067	1 824	1 984	2 618
o/w accommodation and restaurant services	5 693	6 717	5 471	7 257	9 129
o/w utilities	1 557	1 816	2 199	2 413	10 200
o/w other	12 223	14 360	13 844	16 494	28 064
Actionable policy gap	**93 603**	**101 008**	**102 209**	**115 636**	**182 917**
C-efficiency (%)	**53.1%**	**52.3%**	**52.4%**	**55.8%**	**45.9%**
Statutory standard VAT rate			**23%**		
Actionable standard VAT rate	**16.6%**	**16.4%**	**16.3%**	**16.1%**	**13.6%**

Figure 97: PL: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

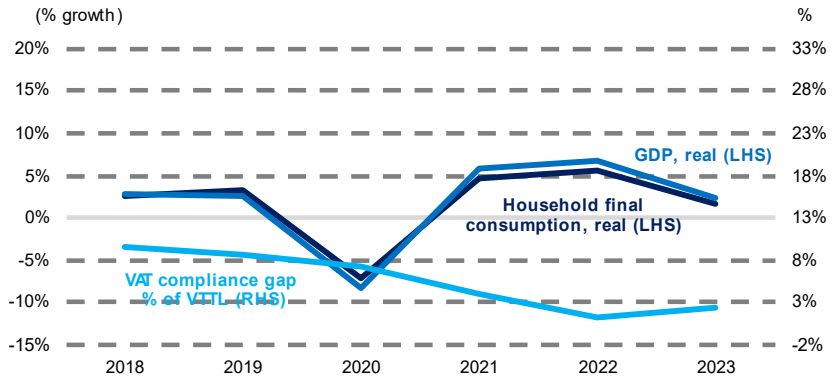
Highlights

- The VAT policy gap in Poland was among the highest in the EU due to the wide application of reduced rates.
- In 2021, it increased significantly—from 48% to 55%. The increase was caused by the Government Anti-Inflation Shield introduced in February 2022. Under this shield, Poland implemented VAT rate cuts on electricity and natural gas (down to 5% and 8%, respectively). In July, the reductions were extended to cover fuel and foodstuffs.
- If the actionable exemptions and reduced rates were discontinued, the current liability could be achieved with a statutory standard rate of 16-17% (except for 2022, the period before the reductioon of temporary rate cuts).

Portugal

VAT revenue in Portugal grew by 18.4% in 2022, with growth in key macroeconomic indicators such as GDP, household final consumption and investment also increasing strongly in 2021 and 2022 (Annex F). Meanwhile, the **VAT compliance gap declined sharply between 2018 and 2022** (Figure 98). Over this period, Portugal's VAT compliance rate remained high in 2021 and 2022, with real GDP and household final consumption rebounding following the pandemic.

Figure 98: PT: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: Own elaboration based on Eurostat.

Before the pandemic, the Portuguese economy grew by around 3% annually between 2018 and 2019. However, the severe impact of the pandemic in 2020 contributed to an 8.3% contraction due to stringent lockdown restrictions and a sharp decline in tourist arrivals. The economy started to rebound in 2021, with real GDP growing by **5.7% in 2021 and 6.8% in 2022**, supported by a **resumption of international travel, a robust recovery in exports and pent-up demand**. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Portugal **demonstrated one of the fastest recoveries among Member States**, surpassing 2019 levels by early 2022. In nominal terms, GDP grew by 12.2% in 2022, mainly due to increased inflation raising prices. Despite robust growth in 2022, the **pace varied**, with strong growth in the first half of the year, followed by weaker growth in the second half of 2022 due to rising inflation triggered by Russia's war of aggression against Ukraine.

Portugal has been **less affected by the impact of Russia's war of aggression against Ukraine on energy prices**, with only 5% of its energy imports coming from Russia and an increasing reliance on renewable energy. To mitigate the impact of rising energy costs, the **government implemented measures** including energy price caps and VAT reductions on electricity from 13% to 6%, which have reduced VAT revenue. Despite these efforts, inflation rose to 8.1% in 2022 but remained below the EU27 average of 9.2%. Before this, inflation was low between 2018 and 2020, with inflation declining in 2020 due to reduced demand, although inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, the rise in inflation caused growth in consumers' real disposable incomes to slow to 0.5%, with consumers dipping into the savings they had built up during the pandemic. Despite this, **real household final consumption rose by 5.6%**, above the EU27 average, due to government support measures and a strong tourism performance, supporting growth in the VAT base. Taking into account the elevated rate of inflation, **this resulted in nominal growth of 13.4%**.

In 2022, consumers and businesses regained confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased in 2022 by 3.4% and 6.7% respectively, increasing VAT liability. Meanwhile, investment by financial institutions increased sizably by 67.5% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. **In 2022, household final consumption in Portugal followed a similar trend to the EU27,** with growth varying across product and service categories**.** In 2022, there was substantial growth in the services sector, with spending increasing on **restaurants and hotels (60.2% growth) and transport services (21.0% growth)**. Since services are more challenging to tax effectively than traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed 2019 levels by 14.7% in nominal terms.

In 2022, **the services sector exhibited faster growth compared to the industrial sector,** with real GVA increasing by 8.4% from 2021, and reaching levels 4.3% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it has started to recover, with arrivals increasing by 130.7% in 2022. Despite this strong growth, levels remained below those recorded pre-pandemic. **The services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector slowed to 2.0%** due to the ongoing energy crisis.

In Portugal, **e-commerce decreased from 2018 to 2022**, with online sales slowing from 18.3% of business turnover to 17.2%. Meanwhile, the share of businesses engaging in e-sales increased from 18.9% in 2018 to 19.6% in 2022. Online retail sales grew from 5.9% in 2018 to 7.2% in 2020, however they have since slowed to 5.9% in 2022. **An increase in e-sales presents opportunities** for increased tax compliance.

Bankruptcy declarations in Portugal diverged from the trend seen in many other Member States, with bankruptcy declarations declining in 2021 and 2022. In 2022, **bankruptcy declarations contracted by 17.9%**, with continued government support mitigating business insolvency risks. However, this trend may reverse once government support is phased out. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 72: PT: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	14.6%	10.3	Positive
Nominal household final consumption, restaurants & hotels	60.2%	33.4	Negative
Nominal household final consumption, custom services aggregate	45.8%	26.0	Negative
GDP services, real	8.4%	3.0	Negative
GDP, real	6.8%	1.1	Positive
Total tourism arrivals	130.7%	88.5	Negative
Bankruptcy declarations	-17.9%	-5.2	Negative
E-commerce, % of sectors	-	2.0	Positive

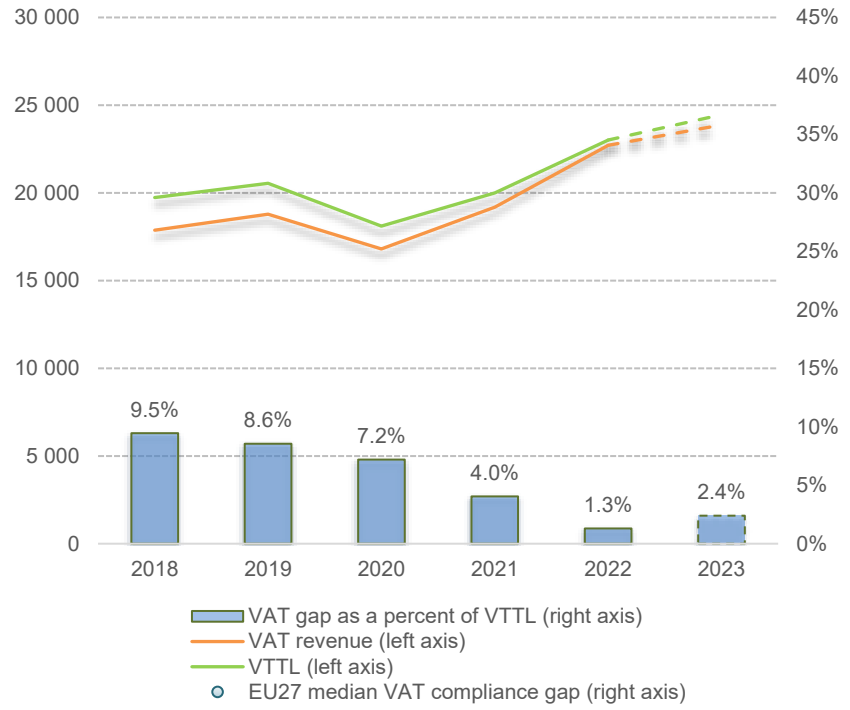
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 73: PT: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**19 734**	**20 543**	**18 105**	**19 995**	**23 011**	*24 456*
o/w liability on household final consumption	14 455	15 052	12 839	14 017	16 978	
o/w liability on gov. and NPISH final consumption	550	598	601	631	663	
o/w liability on intermediate consumption	3 055	3 220	3 081	3 525	3 349	
o/w liability on GFCF	1 187	1 230	1 283	1 473	1 608	
o/w net adjustments	487	442	302	349	412	
VAT revenue	**17 868**	**18 786**	**16 804**	**19 186**	**22 711**	*23 870*
VAT compliance gap	**1 866**	**1 757**	**1 302**	**810**	**300**	
VAT compliance gap (% of VTTL)	**9.5%**	**8.6%**	**7.2%**	**4.0%**	**1.3%**	*2.4%*
VAT compliance gap change since 2018					**-8.2 pp**	

Figure 99: PT: VAT compliance gap, VAT revenue, and VTTL[54]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap has followed a negative trend and gradually decreased, reaching one of the lowest values in the EU in 2022 (1.3% of the VTTL).
- In 2023, the VAT compliance gap is projected to slightly increase.

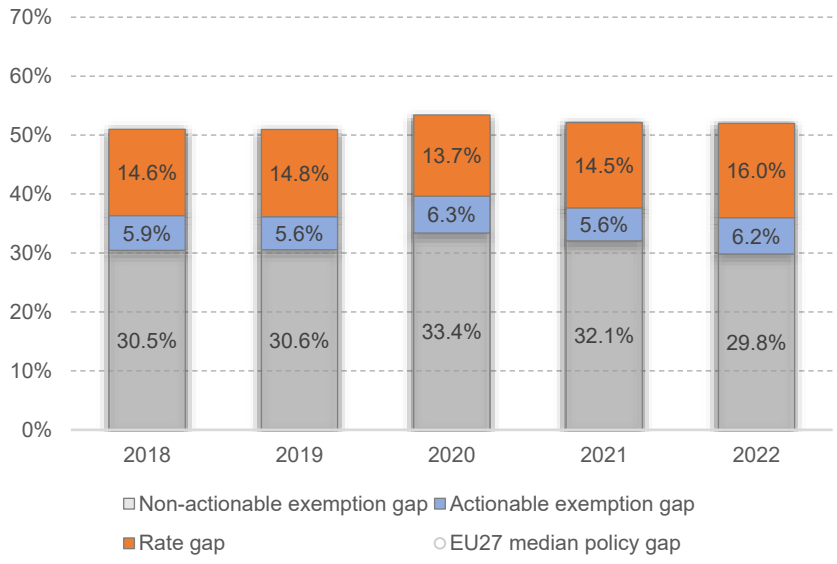
Assessed reliability of estimates:

[54] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 74: PT: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**20 515**	**21 348**	**20 747**	**21 755**	**24 911**
Exemption gap	**14 624**	**15 141**	**15 411**	**15 722**	**17 247**
o/w imputed rents	3 282	3 421	3 550	3 637	3 741
o/w public services	7 668	8 030	8 062	8 422	8 945
o/w financial services	*1 306*	*1 350*	*1 355*	*1 328*	*1 610*
Rate gap	**5 890**	**6 207**	**5 336**	**6 033**	**7 664**
o/w agricultural products, foodstuffs, beverages	2 477	2 520	2 611	2 807	3 185
o/w pharmaceuticals	399	420	430	518	575
o/w transport services	461	528	256	364	489
o/w accommodation and restaurant services	1 987	2 129	1 335	1 564	2 535
o/w utilities	91	103	113	117	149
o/w other	474	508	591	663	731
Actionable policy gap	**8 259**	**8 547**	**7 780**	**8 367**	**10 615**
C-efficiency (%)	**48.3%**	**48.7%**	**47.3%**	**50.7%**	**51.8%**
Statutory standard VAT rate			**23%**		
Actionable standard VAT rate	**16.2%**	**16.1%**	**15.9%**	**15.9%**	**15.4%**

Figure 100: PT: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

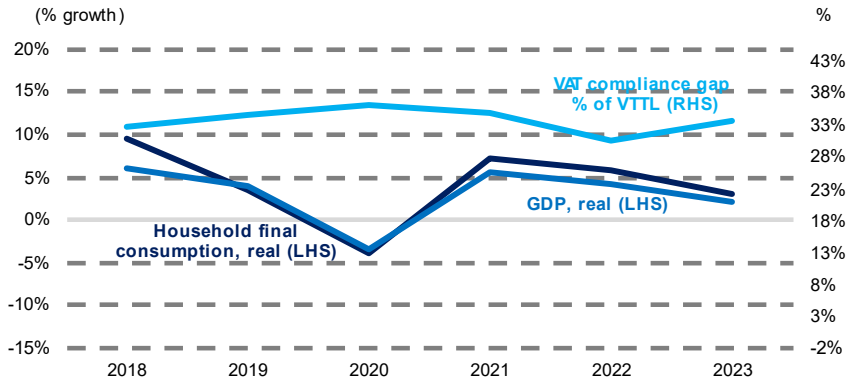
Highlights

- In 2022, the VAT policy gap remained stable, but its structure followed the pattern observed in many other countries, with an increasing VAT rate gap and a decreasing VAT exemption gap.
- If the actionable exemptions and reduced rates were discontinued, the current VTTL could be achieved with a statutory standard rate of around 15-16%.

Romania

VAT revenue in Romania grew by 24.3% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing strongly in 2021 and 2022 (Annex F). Meanwhile, the **VAT compliance gap declined sharply between 2020 and 2022** (Figure 101). Between 2021 and 2022, Romania's VAT compliance rate remained lower than pre-pandemic levels, with real GDP and household final consumption rebounding following the pandemic.

Figure 101: RO: Real GDP, household final consumption, and VAT compliance gap (%growth / %, 2018–2023)



Source: Own elaboration based on Eurostat.

Before the pandemic, the Romanian economy grew by around 5% annually between 2018 and 2019. However, the severe impact of the pandemic in 2020 contributed to a 3.5% contraction due to strict lockdown measures, disruptions to supply chains and weaker external demand. The economy started to rebound in 2021, with real GDP growing by **5.7% in 2021 and 4.1% in 2022**, supported by **a robust recovery in exports, pent-up demand and government stimulus packages**. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Romania's recovery to pre-pandemic levels was one of the quickest, surpassing 2019 GDP levels by the end of 2021. In nominal terms, GDP grew by 17.9% in 2022, mainly due to increased inflation.

Romania has been **less affected by the impact of Russia's war of aggression against Ukraine on energy prices** with a comparatively low reliance on Russian energy imports due to recent diversifications in import sources and strides in expanding domestic gas production. To mitigate the impact of rising energy costs, the **government implemented measures** including energy price caps, subsidies, and VAT reductions on electricity and natural gas from 19% to 5%, which has reduced VAT revenue. Inflation reached 12.0% in 2022, well above the EU27 average of 9.2%. Prior to this, inflation was comparatively low between 2018 and 2020. However, inflationary pressures began to rise in 2021 as the economy reopened.

In 2022, the rise in inflation caused growth in consumers' real disposable incomes to slow to 2.8%, with consumers dipping into the savings they had accumulated over the pandemic. Despite this, **real household final consumption rose by 5.8%**, above the EU27 average, due to wage growth and targeted government support measures, supporting growth in the VAT base. Taking into account the elevated rate of inflation, **this resulted in nominal growth of 21.1%**.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. **In 2022, household final consumption in Romania followed a similar trend to the**

EU27, with growth varying across product and service categories**.** In 2022, there was substantial growth in the goods sector, with spending increasing for **food and non-alcoholic beverages (20.6%) and clothing and footwear (20.6% growth)**. However, goods are easier to tax effectively compared to services, which would lead to a **lower risk of non-compliance**.

In 2022, **the services sector exhibited faster growth compared to the industrial sector,** with real GVA increasing by 8.4% from 2021, and reaching levels 14.5% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but it has started to recover, with arrivals increasing by 87.0% in 2022. Despite this strong growth, levels remained below those recorded pre-pandemic. The **services sector has a higher risk of non-compliance** due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector contracted by 5.8%** due to the ongoing energy crisis and supply chain disruptions.

In Romania, **e-commerce expanded from 2018 to 2022**, with online sales growing from 9.0% of business turnover to 10.9% and the share of businesses engaging in e-sales increasing from 8.8% to 11.2%. Moreover, online retail sales grew from 4.0% in 2017 to 6.7% in 2022. **The surge in e-sales has the potential to reduce non-compliance risks.**

Bankruptcy declarations in Romania surged by 30.0% in 2021, as government pandemic support measures were withdrawn, exposing the financial vulnerabilities of previously supported businesses. However, unlike many other Member States, this trend reversed in 2022, with bankruptcy declarations declining by 57.3%. Nevertheless, this downturn does not signal a sustained improvement in the overall financial health of Romanian companies. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 75: RO: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	20.6%	9.4	Positive
Nominal household final consumption, restaurants & hotels	20.6%	9.4	Negative
Nominal household final consumption, custom services aggregate	20.6%	9.4	Negative
GDP services, real	8.4%	1.5	Negative
GDP, real	4.1%	-1.6	Positive
Total tourism arrivals	87.0%	51.9	Negative
Bankruptcy declarations	-57.3%	-87.3	Negative
E-commerce, % of sectors	-	-2.1	Positive

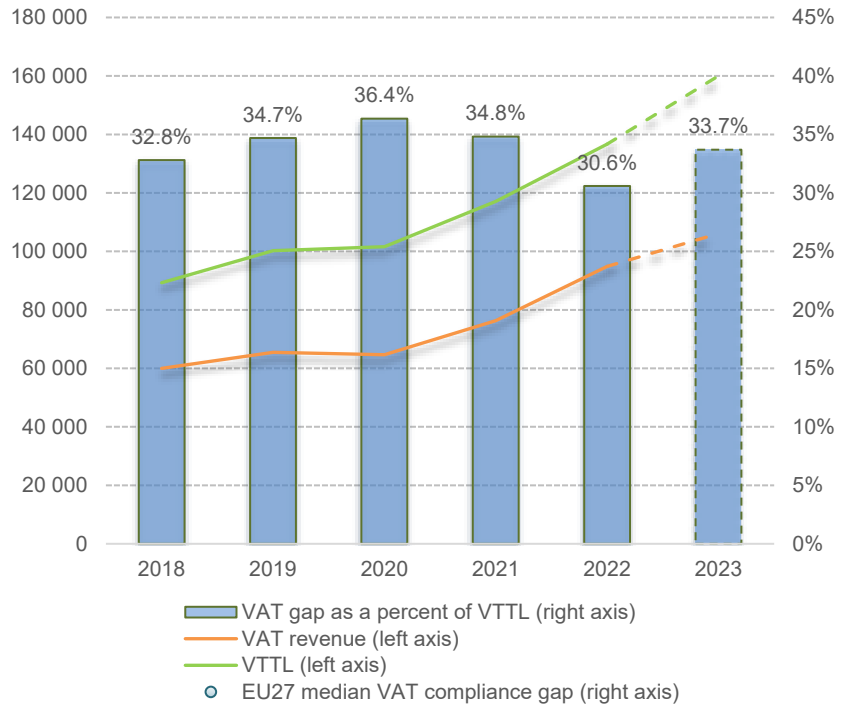
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 76: RO: VAT compliance gaps, VAT receipts, composition of VTTL (RON million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**89 268**	**100 243**	**101 618**	**117 120**	**136 679**	*160 019*
o/w liability on household final consumption	57 535	62 116	58 872	69 210	81 515	
o/w liability on gov. and NPISH final consumption	3 581	4 306	4 741	4 945	5 365	
o/w liability on intermediate consumption	9 752	10 812	12 364	13 529	14 314	
o/w liability on GFCF	18 702	22 737	25 042	28 768	34 553	
o/w net adjustments	- 300	272	598	668	932	
VAT revenue	**59 990**	**65 461**	**64 677**	**76 336**	**94 867**	*106 103*
VAT compliance gap	**29 279**	**34 782**	**36 941**	**40 784**	**41 812**	
VAT compliance gap (percent of VTTL)	**32.8%**	**34.7%**	**36.4%**	**34.8%**	**30.6%**	*33.7%*
VAT compliance gap change since 2018					**-2.2 pp**	

Figure 102: RO: VAT compliance gap, VAT revenue, and VTTL[55]



Source: own calculation, download underlying data.

Highlights

- Despite significant improvements in VAT compliance in 2022, the VAT compliance gap remained the highest in the EU.
- Romania introduced the SAF-T reporting requirement for large taxpayers as of January 2022. Due to a 12-month transition period, the requirement became mandatory in practice as of January 2023.

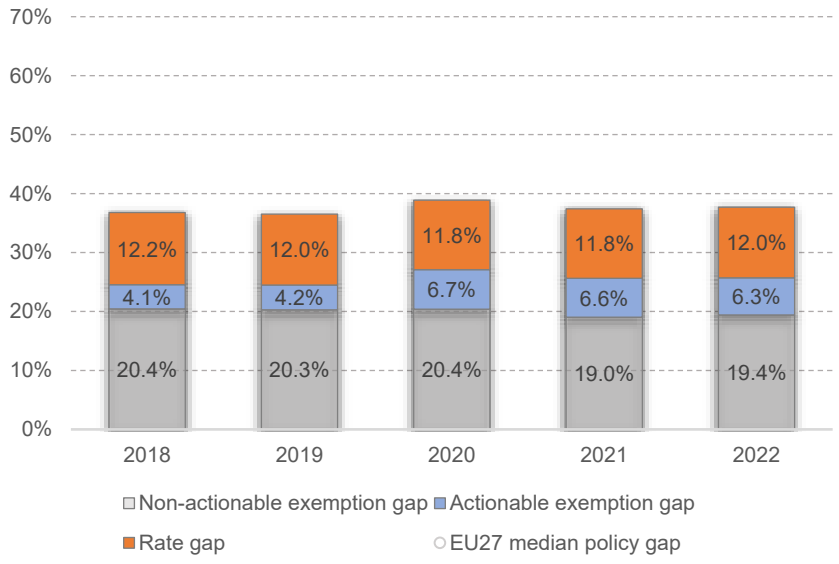
Assessed reliability of estimates:

[55] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 77: RO: VAT policy gap and its components (RON million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**51 937**	**57 635**	**64 632**	**70 015**	**82 689**
Exemption gap	**34 640**	**38 677**	**45 043**	**47 952**	**56 376**
o/w imputed rents	10 646	12 177	12 752	13 407	18 280
o/w public services	18 351	20 453	21 552	22 595	24 786
o/w financial services	*- 138*	*- 632*	*- 395*	*- 391*	*- 459*
Rate gap	**17 296**	**18 958**	**19 589**	**22 063**	**26 313**
o/w agricultural products, foodstuffs, beverages	11 180	12 036	12 598	13 528	15 367
o/w pharmaceuticals	1 714	1 886	2 192	2 583	2 887
o/w transport services	729	821	529	1 231	1 494
o/w accommodation and restaurant services	2 212	2 484	2 458	2 576	4 079
o/w utilities	280	310	335	378	456
o/w other	1 181	1 423	1 477	1 766	2 031
Actionable policy gap	**23 078**	**25 637**	**30 722**	**34 404**	**40 082**
C-efficiency (%)	**48.2%**	**47.6%**	**46.6%**	**49.0%**	**52.3%**
Statutory standard VAT rate			**19%**		
Actionable standard VAT rate	**16.1%**	**16.4%**	**16.1%**	**16.1%**	**16.1%**

Figure 103: RO: VAT policy gap, rate gap, and exemption gap



Highlights

- The VAT policy gap in Romania remained stable compared to 2022, as Romania has not introduced far-reaching changes in the application of rates and exemptions.
- Overall, the VAT policy gap remains relatively low, mostly due to the relatively low share of forgone revenue due to non-taxability of public services.

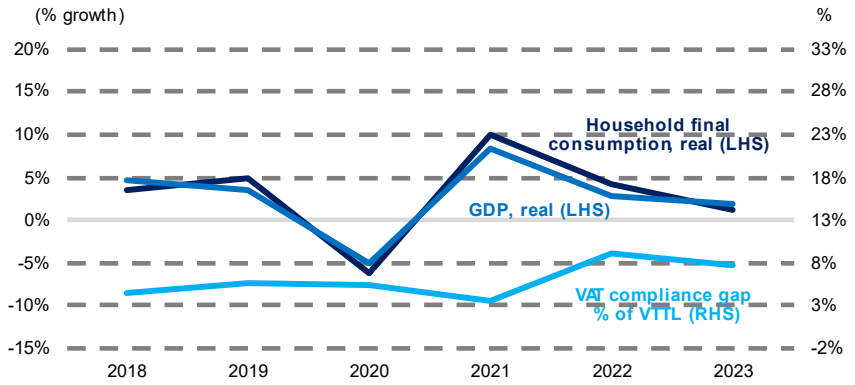
Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

Slovenia

VAT revenue in Slovenia grew by 8.8% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing strongly in 2021 and more moderately in 2022 (Annex F). Meanwhile, the **VAT compliance gap rose sharply between 2018 and 2022**, despite declining in 2020 and 2021 (Figure 104). During this period, Slovenia's VAT compliance rate was at its lowest in 2021 but increased significantly in 2022, despite real GDP and household final consumption rebounding following the pandemic.

Figure 104: SI: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: Own elaboration based on Eurostat.

Before the pandemic, the Slovenian economy grew by around 4% annually between 2018 and 2019. However, the severe impact of the pandemic in 2020 contributed to a 5.0% contraction due to depressed household final consumption and a sharp decline in tourist arrivals. The economy started to rebound in 2021, with real GDP growing by **8.4% and 2.9% in 2022**, supported by a **resumption of international travel, pent-up demand, and a resilient labour market**. The robust growth in GDP from 2021 correlated with strong growth in the VAT base. Slovenia **demonstrated one of the swiftest recoveries amongst Member States**, surpassing 2019 levels by the middle of 2021. In nominal terms, GDP grew by 9.5% in 2022, mainly due to increased inflation raising prices. Despite strong growth in 2022, the **pace varied**, with strong growth in the first half of the year, followed by weaker growth in the second half of 2022 due to rising inflation triggered by Russia's war of aggression against Ukraine.

Slovenia's high dependence on Russian gas made it particularly vulnerable to the price shocks caused by Russia's war of aggression against Ukraine. To mitigate the impact of rising energy costs, **the government secured alternative source markets for gas**, such as Algeria, in addition to implementing energy efficiency programmes and VAT reductions on electricity, natural gas and district heating from 22% to 9.5% which has reduced VAT revenue. Inflation rose to 9.3% in 2022, in line with the EU27 average. Prior to this, inflation was low from 2018 to 2020, with deflation occurring in 2020 due to decreased demand. However, inflationary pressures started to increase in 2021 as the economy began to reopen.

In 2022, the rise in inflation caused consumers' real disposable incomes to contract by 1.2%, as the purchasing power of household budgets was squeezed. Despite this, **real household final consumption rose by 4.1%**, on par with the EU27 average, due to the government support measures and a strong tourism performance, supporting growth in the VAT base. Taking into account the elevated rate of inflation, **this resulted in nominal growth of 14.8%**.

In 2022, consumers and businesses regained confidence and resumed postponed investments, triggering VAT receipts. Government and household investments, the latter including non-profit institutions serving households, increased in 2022 by 26.2% and 14.5% respectively, increasing VAT liability. Meanwhile, investments by financial institutions increased by 10.2% in 2022. Non-financial corporations have also seen strong investment growth of 13.4%, but a large proportion of the corresponding VAT output will be reclaimed by businesses.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. **In 2022, household final consumption in Slovenia followed a similar trend to the EU27,** with growth varying across product and service categories**.** In 2022, there was substantial growth in the services sector, with spending increasing on **restaurants and hotels (43.8% growth) and recreational goods and services (29.1% growth)**. Since services are more challenging to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. In 2022, household final consumption of services surpassed 2019 levels by 10.1% in nominal terms.

Within the services sector, hospitality was one of the hardest hit by the pandemic but it has started to recover, with arrivals increasing by 66.8% in 2022. This robust growth resulted in arrivals **surpassing pre-pandemic levels by 3.1%,** outperforming the EU27 average of 90% of 2019 levels. As hospitality is a services sector it has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **growth in the industrial sector declined to -2.7%** due to the ongoing energy crisis.

In Slovenia, **e-commerce growth was moderate between 2018 and 2022.** While online sales marginally declined from 17.5% of business turnover to 17.4%, the share of businesses engaging in e-sales increased from 25.4% to 25.9%. Meanwhile, online retail sales rose from 2.4% to 4.8% over the same period. **An increase in e-sales presents opportunities for increased tax compliance.**

Bankruptcy declarations in Slovenia diverged from the trend seen in many other Member States, with bankruptcy declarations continuing to decline in 2021 and 2022. Government support continued to shield businesses from insolvency in 2022, resulting in an **8.3% decline in bankruptcy declarations**. However, this trend may reverse once government support is phased out. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 78: SI: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	13.3%	9.8	Positive
Nominal household final consumption, restaurants & hotels	43.8%	17.7	Negative
Nominal household final consumption, custom services aggregate	37.8%	16.4	Negative
GDP, real	2.9%	-5.6	Positive
Total tourism arrivals	66.8%	17.4	Negative
Bankruptcy declarations	-8.3%	1.4	Negative
E-commerce, % of sectors	-	-1.6	Positive

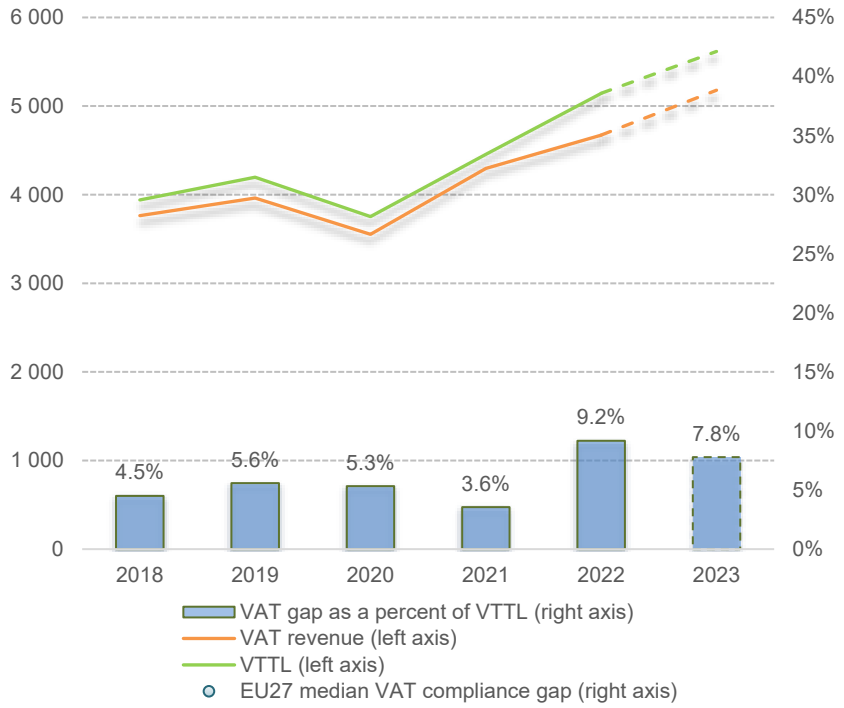
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 79: SI: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**3 940**	**4 197**	**3 753**	**4 455**	**5 144**	*5 616*
o/w liability on household final consumption	2 840	3 025	2 645	3 125	3 611	
o/w liability on gov. and NPISH final consumption	97	99	107	117	122	
o/w liability on intermediate consumption	519	560	541	630	708	
o/w liability on GFCF	402	427	402	512	627	
o/w net adjustments	83	86	58	71	76	
VAT revenue	**3 763**	**3 962**	**3 553**	**4 297**	**4 673**	*5 179*
VAT compliance gap	**177**	**234**	**200**	**159**	**472**	
VAT compliance gap (% of VTTL)	**4.5%**	**5.6%**	**5.3%**	**3.6%**	**9.2%**	*7.8%*
VAT compliance gap change since 2018					**+4.7 pp**	

Figure 105: SI: VAT compliance gap, VAT revenue, and VTTL[56]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap in 2022 increased by 5.6 percentage points, reaching 9.2% of the VTTL. This was substantially above the values observed in preceding years.
- The VAT compliance gap is projected to have decreased slightly in 2023.

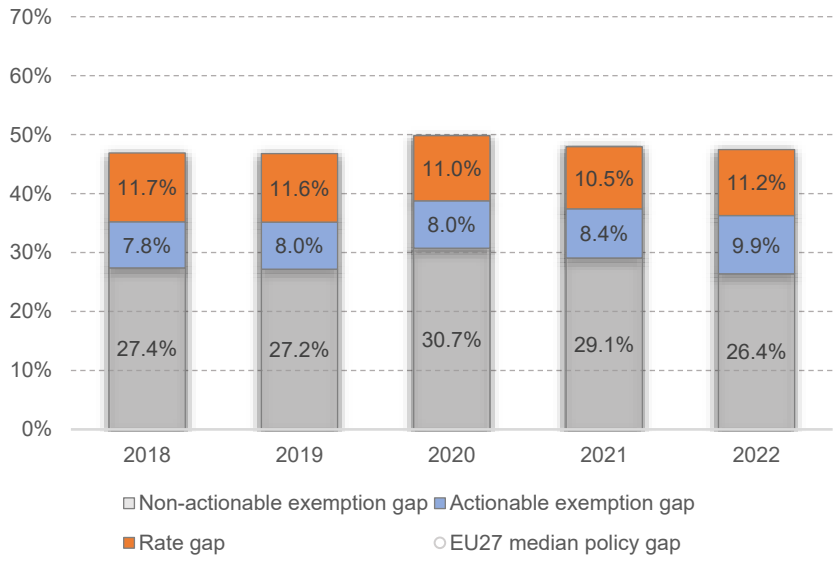
Assessed reliability of estimates:

[56] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 80: SI: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**3 478**	**3 690**	**3 724**	**4 106**	**4 648**
Exemption gap	**2 613**	**2 773**	**2 898**	**3 204**	**3 551**
o/w imputed rents	576	583	592	622	705
o/w public services	1 253	1 337	1 472	1 614	1 591
o/w financial services	*203*	*223*	*233*	*252*	*288*
Rate gap	**866**	**917**	**826**	**902**	**1 097**
o/w agricultural products, foodstuffs, beverages	417	442	441	449	509
o/w pharmaceuticals	91	95	97	104	117
o/w transport services	53	54	31	39	49
o/w accommodation and restaurant services	140	154	100	134	189
o/w utilities	52	55	58	66	99
o/w Z (%)	113	117	99	110	133
Actionable policy gap	**1 446**	**1 547**	**1 426**	**1 617**	**2 064**
C-efficiency (%)	**57.2%**	**56.7%**	**53.7%**	**57.3%**	**54.8%**
Statutory standard VAT rate			**22%**		
Actionable standard VAT rate	**16.6%**	**16.6%**	**16.5%**	**16.7%**	**16.5%**

Figure 106: SI: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

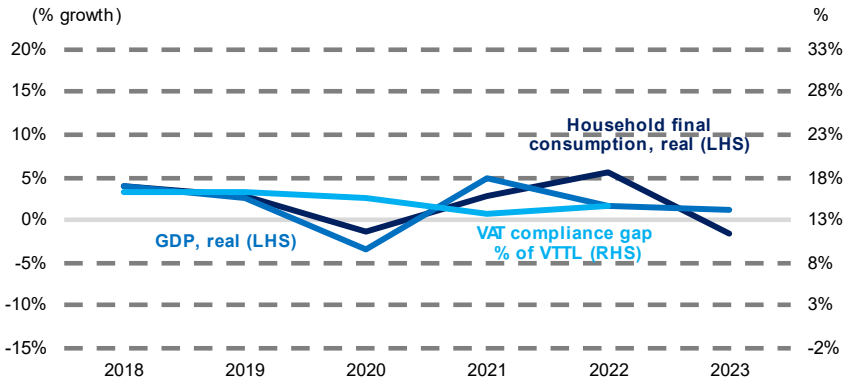
Highlights

- To mitigate the rise in energy prices, Slovenia introduced a package of temporary VAT rate cuts on electricity, natural gas supply, district heating, and firewood. These measures have been in place since September 2022. The VAT rate was reduced from 22% to 9.5%. As a result, the rate gap increased in 2022.
- If the actionable exemptions and reduced rates were discontinued, the current VTTL could be achieved with a statutory standard VAT rate of 17%.

Slovakia

VAT revenue in Slovakia grew by 16.2% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing strongly in 2021 and more moderately in 2022 (Annex F). **Meanwhile, the VAT compliance gap trended downward between 2018 and 2021,** before rising again in 2022 (Figure 107). Slovakia's compliance gap reached its lowest level in 2021, as real GDP and household final consumption rebounded strongly following the pandemic.

Figure 107: SK: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, **Slovakia grew at an average of 3% annually between 2018 and 2019.** In 2020 the pandemic led to a 3.3% decline, much better than the EU27 average of 5.8%. **Slovakia performed better than many other Member States in 2020**, thanks to less stringent lockdowns, effective support measures, a favourable economic structure focused on manufacturing and exports, and a lower dependence on tourism. **A robust recovery followed in 2021, with GDP growth of 4.8% in 2021 and 1.8% in 2022.** The rebound was driven by the easing of restrictions, a resilient export sector, especially for automotive and manufacturing, increased consumption, and investments in digital and green technologies, which created growth opportunities in emerging sectors. In nominal terms, GDP increased by 9.4% in 2022, largely driven by rising inflation.

Slovakia was profoundly affected by the **impact of Russia's war of aggression against Ukraine on energy prices**, due to the economy being **heavily reliant on Russian energy.** Before the war, the country was almost entirely dependent on Russia for resources, but it has since made efforts to diversify. To mitigate rising energy costs, the Slovakian government implemented measures that would provide immediate relief from rising energy costs such as price caps on electricity and gas, financial support for low-income households, subsidies for energy-intensive sectors and temporary reductions in energy taxes and rebates, while also working towards long-term solutions for energy security and efficiency by providing financial and regulatory support. Despite these efforts, **inflation rose to 12.1% in 2022**, well above the EU27 average of 9.2%. Before this, inflation had been stable at approximately 3% from 2018 to 2021, with a minor decrease in 2020 due to reduced demand.

As inflation rose in 2022 wages could not keep pace, with real disposable incomes declining by 1.0%. Despite this, **real household final consumption grew by robust 5.6%**, due to pent-up demand and as consumers drew down on the savings they had built up during the pandemic, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 18.4%.

In 2022, **consumers and businesses proceeded with their postponed investments**, triggering VAT receipts. Investments by the general government and households, the latter including non-profit institutions serving households, increased strongly in 2022 by 10.1% and 20.2% respectively, contributing to higher VAT liabilities. Additionally, investments by financial institutions increased robustly by 7.6% in 2022.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Slovakia's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with spending on **restaurants and hotels (48.4% growth) and recreational goods and services (32.7% growth).** Since services are harder to tax effectively than traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 14.3% in nominal terms.

In 2022, **the services sector grew faster than the industrial sector**, with real GVA increasing by 2.4% and levels 5.0% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, with **arrivals increasing by 107.0% in 2022**. Despite such strong growth, levels remained 24.3% below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, growth in **the industrial sector declined by 1.2%**, with levels remaining below those recorded pre-pandemic.

In Slovakia, **e-commerce growth increased between 2018 and 2022**, except for 2021. Online sales rose from 20.8% in 2018 to 22.7% of business turnover in 2022. The share of businesses engaging in e-sales fluctuated but trended upwards from 16.3% in 2018 to 17.5% in 2022. Online retail sales in the meantime remained stable between 2018 and 2022. The increased adoption of e-commerce among businesses has the potential to **reduce non-compliance risks**.

Bankruptcy declarations in Slovakia decreased by 25.1% in 2022, a continuation of the trend observed from 2020. The decrease in declarations is driven by government support in place that is keeping businesses afloat. However, this trend will reverse once government support is phased out. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 81: SK: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	20.6%	16.8	Positive
Nominal household final consumption, Restaurants & hotels	48.4%	55.4	Negative
Nominal household final consumption, custom services aggregate	39.3%	38.6	Negative
GDP services, real	2.4%	0.7	Negative
GDP, real	1.8%	-3.0	Positive
Total tourism arrivals	107.0%	107.7	Negative
Bankruptcy declarations	-25.1%	-10.7	Negative
E-commerce, % of sectors	-	0.9	Positive

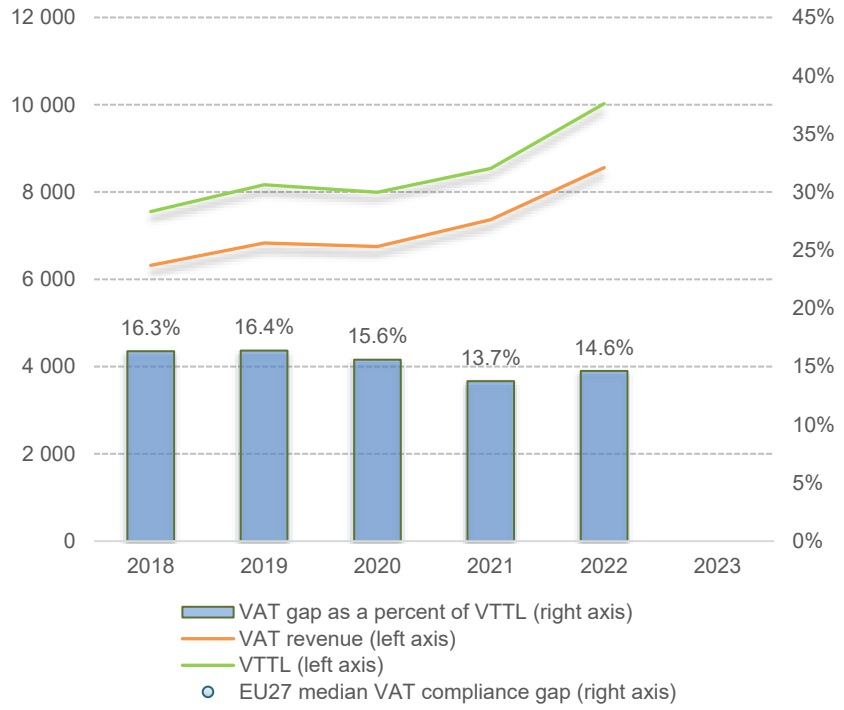
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 82: SK: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**7 552**	**8 168**	**7 995**	**8 540**	**10 025**	*X*
o/w liability on household final consumption	5 732	6 028	6 001	6 308	7 533	
o/w liability on gov. and NPISH final consumption	132	104	103	115	128	
o/w liability on intermediate consumption	966	1 163	1 078	1 311	1 447	
o/w liability on GFCF	761	915	860	852	967	
o/w net adjustments	- 38	- 43	- 47	- 45	- 50	
VAT revenue	**6 319**	**6 830**	**6 749**	**7 366**	**8 559**	*X*
VAT compliance gap	**1 233**	**1 337**	**1 246**	**1 174**	**1 466**	
VAT compliance gap (% of VTTL)	**16.3%**	**16.4%**	**15.6%**	**13.7%**	**14.6%**	*X*
VAT compliance gap change since 2018					**-1.7 pp**	

Figure 108: SK: VAT compliance gap, VAT revenue, and VTTL[57]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap in Slovakia was relatively stable in recent years, fluctuating between 13.7% and 16.4% of the VTTL.
- The fast estimates of the VAT compliance gap for Slovakia for 2023 are not published in this report due to uncertainty over the effective rate calculation for this year.

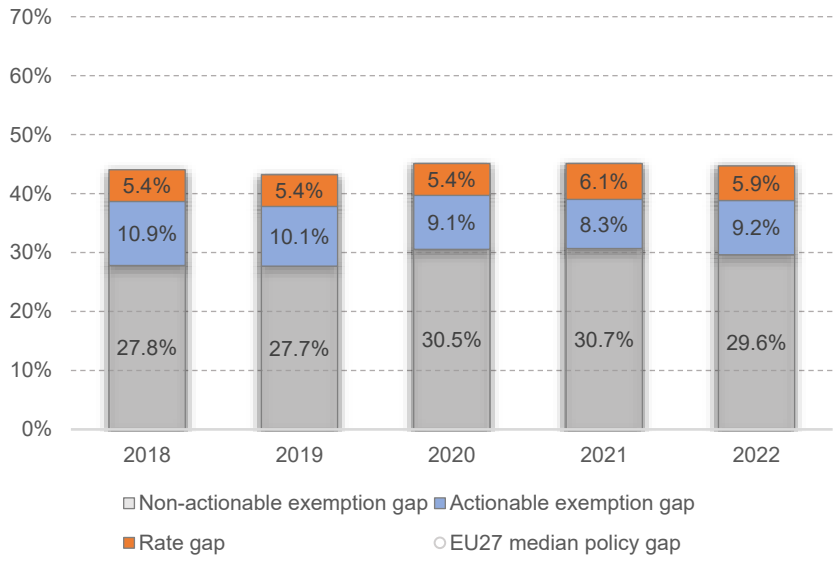
Assessed reliability of estimates:

[57] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 83: SK: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**5 944**	**6 214**	**6 566**	**7 012**	**8 101**
Exemption gap	**5 217**	**5 439**	**5 778**	**6 067**	**7 038**
o/w imputed rents	1 320	1 360	1 526	1 571	1 748
o/w public services	2 064	2 241	2 571	2 833	3 170
o/w financial services	*367*	*384*	*349*	*367*	*453*
Rate gap	**728**	**775**	**788**	**945**	**1 063**
o/w agricultural products, foodstuffs, beverages	110	108	169	249	282
o/w pharmaceuticals	180	162	177	199	218
o/w transport services	146	159	151	175	194
o/w accommodation and restaurant services	0	23	17	15	22
o/w utilities	37	66	18	20	23
o/w other	255	257	256	287	324
Actionable policy gap	**2 193**	**2 230**	**2 119**	**2 240**	**2 730**
C-efficiency (%)	**52.0%**	**52.6%**	**51.2%**	**52.2%**	**52.1%**
Statutory standard VAT rate			**20%**		
Actionable standard VAT rate	**14.7%**	**15.1%**	**14.7%**	**14.7%**	**14.7%**

Figure 109: SK: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

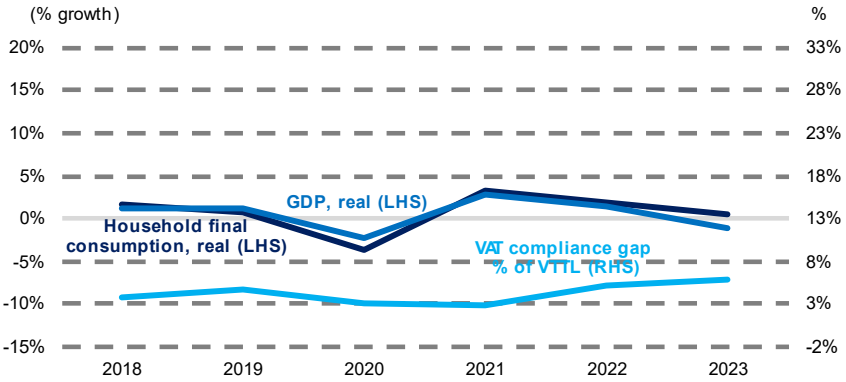
Highlights

- Similarly to the VAT compliance gap, the VAT policy gap and its structure were stable between 2018 and 2022.
- Compared to other countries in the region, the VAT rate gap in Slovakia was relatively low, whereas the exemption gap was relatively high.
- If the actionable exemptions and reduced rates were discontinued, the current VTTL could be achieved with a statutory standard VAT rate of 15-16%.

Finland

VAT revenue in Finland grew by 6.4% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and more moderately in 2022 (Annex F). **Meanwhile, the VAT compliance gap trended downward between 2019 and 2021,** before rising again in 2022 (Figure 110). In 2021, Finland's compliance gap reached its lowest level as real GDP and household final consumption rebounded strongly following the pandemic.

Figure 110: FI: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, Finland's **economy grew at an average of 1% annually between 2018 and 2019.** However, in 2020 the pandemic led to a 2.4% decline, much better than the EU27 average of 5.8%. **Finland performed better than other Member States in 2020**, due to its effective response early in the pandemic. Unlike many other EU27 countries, Finland's economy is less dependent on tourism and benefits from a strong digital infrastructure, which facilitated a smoother transition to remote work and digital services. A recovery followed in 2021, with GDP growth of 2.8% in 2021 and 1.3% in 2022, fuelled by a strong rebound in consumer spending, government support and resilient export performance in industries such as technology, machinery, and forestry. In nominal terms, GDP increased by 6.8% in 2022, largely driven by rising inflation.

Finland was affected by the impact of **Russia's war of aggression against Ukraine on energy prices** as the economy has **historically relied on Russian energy, particularly for natural gas, oil, and uranium.** The economy has since been actively reducing its reliance on Russian energy by diversifying its energy sources and increasing the share of renewables in its energy mix. To address rising energy costs, the government implemented a cap on electricity prices, provided energy subsidies and support for low-income households, lowered the VAT rate on electricity from 24% to 10% for a limited period, offered financial assistance to energy-intensive industries, and encouraged energy efficiency measures. Despite these efforts, **inflation rose to 7.2% in 2022**. Although this was the highest level reached in decades, it was **the third-lowest inflation reading across Member States**. Before this, inflation had remained stable at around 1%, before dipping in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

As inflation rose in 2022, wages could not keep pace with real disposable incomes contracting by 2.4%. Despite this, **real household final consumption grew moderately by 1.8%**, due to pent-up demand and as consumers drew down on the savings they had built up during the pandemic, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 8.1%.

In 2022, **consumers and businesses proceeded with their postponed investments**, triggering VAT receipts. Investments by the general government and households, the latter including non-profit institutions serving households, increased in 2022 by 7.4% and 11.7% respectively, contributing to higher VAT liabilities.

Finland's nominal household final consumption in 2022 mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with spending on **restaurants and hotels (31.1% growth) and transport services (9.9% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. Despite robust growth in 2022, household final consumption of services remained slightly below pre-pandemic levels in nominal terms.

In 2022, **the services sector grew faster than the industrial sector**, with real GVA increasing by 3.1% and levels 4.2% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, with arrivals increasing by 168.1% in 2022. Despite such strong growth, levels remained well below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **growth in the industrial sector declined by 1.7%**.

In Finland, **e-commerce growth increased between 2018 to 2022.** Data for online sales was patchy over this timeframe, with online sales rising from 20.7% in 2018 to 22.0% of business turnover in 2021. The share of businesses engaging in e-sales increased from 23.8% in 2018 to 32.4% in 2022. Meanwhile, online retail sales data was limited, but rose from 6.0% in 2018 to 6.8% in 2021. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

Bankruptcy declarations in Finland increased by 14.9% in 2022, a continuation of the trend observed in 2021. The increase was largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 84: FI: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	5.3%	2.8	Positive
Nominal household final consumption, restaurants & hotels	31.1%	25.6	Negative
Nominal household final consumption, custom services aggregate	20.0%	14.5	Negative
GDP services, real	3.1%	-1.1	Negative
GDP, real	1.3%	-1.5	Positive
Total tourism arrivals	168.1%	179.3	Negative
Bankruptcy declarations	14.9%	-3.4	Negative
E-commerce, % of sectors	-	3.1	Positive

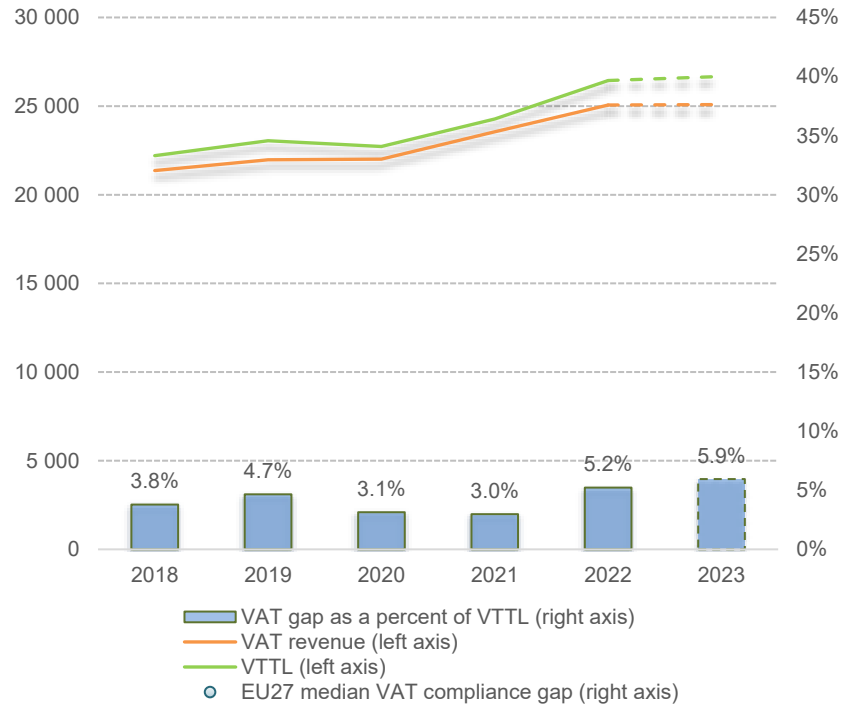
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 85: FI: VAT compliance gaps, VAT receipts, composition of VTTL (EUR million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**22 204**	**23 047**	**22 720**	**24 273**	**26 443**	*26 673*
o/w liability on household final consumption	12 121	12 205	11 684	12 570	13 748	
o/w liability on gov. and NPISH final consumption	520	565	566	604	714	
o/w liability on intermediate consumption	4 737	4 850	4 943	5 544	5 903	
o/w liability on GFCF	4 300	4 819	4 927	4 926	5 404	
o/w net adjustments	527	609	600	629	674	
VAT revenue	**21 364**	**21 974**	**22 005**	**23 551**	**25 061**	*25 087*
VAT compliance gap	**840**	**1 073**	**715**	**722**	**1 382**	
VAT compliance gap (% of VTTL)	**3.8%**	**4.7%**	**3.1%**	**3.0%**	**5.2%**	*5.9%*
VAT compliance gap change since 2018					**+1.4 pp**	

Figure 111: FI: VAT compliance gap, VAT revenue, and VTTL[58]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap in 2022 increased by 2.2 percentage points, reaching 5.2% of the VTTL. It is projected to have increased slightly further in 2023.
- The VAT compliance gap in Finland has remained one of the lowest and most stable in the EU.

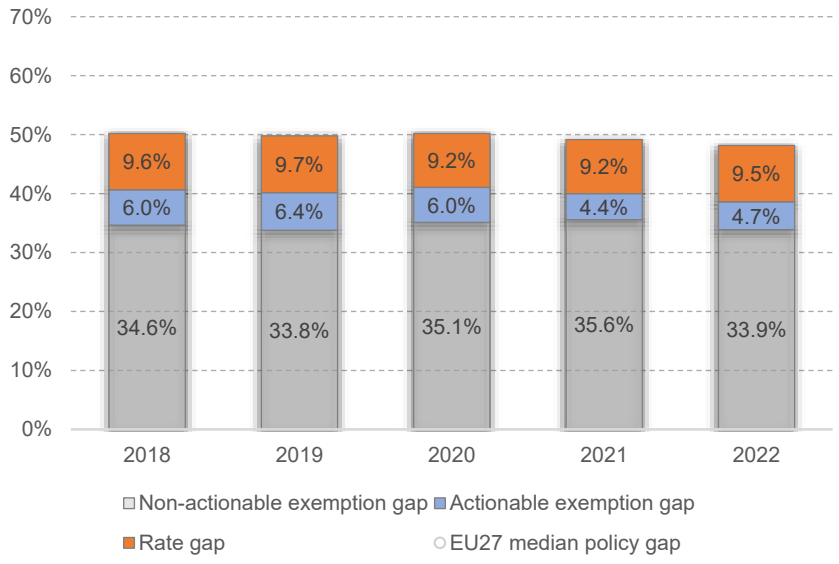
Assessed reliability of estimates:

[58] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 86: FI: VAT policy gap and its components (EUR million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**22 393**	**22 866**	**22 900**	**23 467**	**24 562**
Exemption gap	**18 126**	**18 431**	**18 725**	**19 088**	**19 697**
o/w imputed rents	4 489	4 627	4 835	4 939	5 033
o/w public services	9 622	9 542	9 731	10 476	10 570
o/w financial services	*1 338*	*1 344*	*1 443*	*1 565*	*1 674*
Rate gap	**4 267**	**4 435**	**4 175**	**4 379**	**4 865**
o/w agricultural products, foodstuffs, beverages	1 234	1 269	1 333	1 346	1 394
o/w pharmaceuticals	397	430	440	447	466
o/w transport services	449	477	275	327	443
o/w accommodation and restaurant services	681	712	557	604	785
o/w utilities	0	0	0	0	37
o/w other	1 505	1 548	1 571	1 656	1 739
Actionable policy gap	**6 944**	**7 354**	**6 890**	**6 487**	**7 285**
C-efficiency (%)	**57.5%**	**57.6%**	**58.4%**	**59.0%**	**59.1%**
Statutory standard VAT rate			**24%**		
Actionable standard VAT rate	**18.0%**	**18.3%**	**18.6%**	**18.9%**	**19.0%**

Figure 112: FI: VAT policy gap, rate gap, and exemption gap



Note: the rate, actionable, and non-actionable exemption gaps sum up to the VAT policy gap.

Source: own calculation, download underlying data.

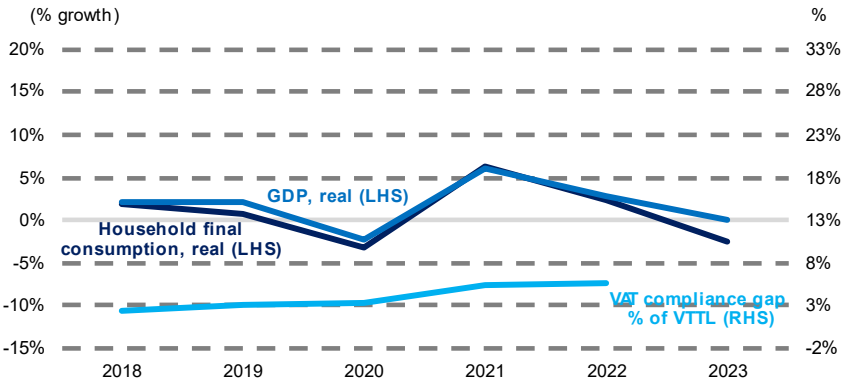
Highlights

- The VAT rate for electricity consumption was temporarily decreased from 24% to 10% between December 2022 and April 2023. This explains the slight increase in the rate gap observed in 2022.
- The VAT exemption gap dropped by approximately 1 percentage point in 2022, caused by a decline in forgone revenue due to non-taxability of public services.

Sweden

VAT revenue in Sweden grew by 10.6% in 2022, with growth in key macroeconomic indicators such as GDP and household final consumption also increasing robustly in 2021 and more moderately in 2022 (Annex F). **Meanwhile, the VAT compliance gap increased from 2018 to 2022,** despite real GDP and household final consumption rebounding strongly after the pandemic (Figure 113).

Figure 113: SE: Real GDP, household final consumption, and VAT compliance gap (% growth / %, 2018–2023)



Source: own elaboration based on Eurostat.

Before the pandemic, Sweden's **economy grew at an average of 2% annually between 2018 and 2019.** However, in 2020 **the pandemic led to a 2.3% contraction**, much better than the EU27 average of 5.8%. Sweden did not contract as much as many other Member States as the country had a more relaxed approach to lockdowns and allowed more economic activities, particularly in retail and manufacturing, to continue operating. **A strong recovery followed in 2021**, with GDP growth of 5.9% in 2021 and 2.7% in 2022, fuelled by strong export performance in the manufacturing, technology, and pharmaceutical sectors. In nominal terms, GDP increased by 8.9% in 2022, largely driven by rising inflation.

Sweden has a relatively low dependence on Russian energy compared to many other EU countries, as it has a strong focus on renewable energy. Despite this, the economy was still affected by the impact of Russia's war of aggression against Ukraine on energy prices. To alleviate rising energy costs, the Swedish government implemented price caps on electricity consumption up to a certain level, a compensation scheme for electricity was set up to reimburse households for part of their electricity costs, as well as temporary reductions in fuel taxes and investment in renewables and energy efficiency incentives. Despite these efforts, **inflation rose to 8.1% in 2022**, marking the highest level in decades, though it stayed below the EU27 average of 9.2%. Before this, inflation had remained stable at around 2% between 2018 and 2019, before dipping in 2020 due to reduced demand. However, inflationary pressures began to rise in 2021 as the economy reopened.

As inflation rose in 2022, wages could not keep pace with real disposable incomes contracting by 0.1%. Despite this, real household final consumption grew by 2.4%, due to pent-up demand and consumers drawing on the savings they had built up during the pandemic, which supported growth in the VAT base. Taking into account the rise in inflationary pressures, this resulted in nominal growth of 9.3%.

In 2022, **consumers and businesses proceeded with their postponed investments**, triggering VAT receipts. Investments by the general government and households, the latter including non-profit

institutions serving households, increased in 2022 by 5.5% and 10.0% respectively, contributing to higher VAT liabilities. Additionally, investments by financial institutions increased significantly by 25.7% in 2022, which was well above the growth rate of deductible investment of non-financial corporations.

Household final consumption patterns can influence VAT compliance through the volume and types of transactions. In 2022, Sweden's nominal household final consumption mirrored trends seen across the EU27, with growth varying across product and service categories. There was strong growth in the services sector in 2022, with an increase in spending on **restaurants and hotels (25.8% growth) and transport services (10.6% growth).** Since services are harder to tax effectively compared to traditional goods, it can lead to a **higher risk of non-compliance**. By the end of 2022, household final consumption of services had surpassed pre-pandemic levels by 15.3% in nominal terms.

In 2022, **the services sector grew faster than the industrial sector**, with real GVA increasing by 3.1% and levels 5.4% above those recorded pre-pandemic. Within the services sector, hospitality was one of the hardest hit by the pandemic but began recovering, **with arrivals increasing by 121.7% in 2022.** Despite such strong growth, levels remained 13.0% below those recorded pre-pandemic. The services sector has a higher risk of non-compliance due to its diversity and the intangibility of services. Meanwhile, **growth in the industrial sector increased by only 1.1%**, but levels remain well above pre-pandemic levels by 9.8%.

In Sweden, **e-commerce growth increased between 2018 and 2022,** with online sales rising from 24.0% in 2018 to 26.0% of business turnover in 2022. The share of businesses engaging in e-sales increased from 31.7% in 2018 to 38.4% in 2022. Meanwhile, online retail sales fluctuated between 2018 and 2022. The increased adoption of e-commerce among businesses has the potential to reduce non-compliance risks.

Bankruptcy declarations in Sweden increased by 3.9% in 2022. The increase was largely due to the phasing out of government pandemic support, leading firms that had been sustained during the crisis to file for insolvency. The closure of firms contributes to VAT non-compliance, complicating recovery processes and thereby reducing VAT collection.

Table 87: SE: Macroeconomic factors that affect VAT revenue and compliance (% / percentage points change, 2021–2022)

Variable	Annual growth in the variable in 2022 (y/y % change)	PP difference in annual growth of the variable (2022 vs 2021)	The sign of the expected impact of the indicator on VAT compliance
Nominal household final consumption, food & non-alcoholic beverages	3.4%	-4.4	Positive
Nominal household final consumption, restaurants and hotels	25.8%	15.0	Negative
Nominal household final consumption, custom services aggregate	17.1%	7.2	Negative
GDP services, real	3.1%	-2.9	Negative
GDP, real	2.7%	-3.2	Positive
Total tourism arrivals	121.7%	68.9	Negative
Bankruptcy declarations	3.9%	-	Negative
E-commerce, % of sectors	-	2.1	Positive

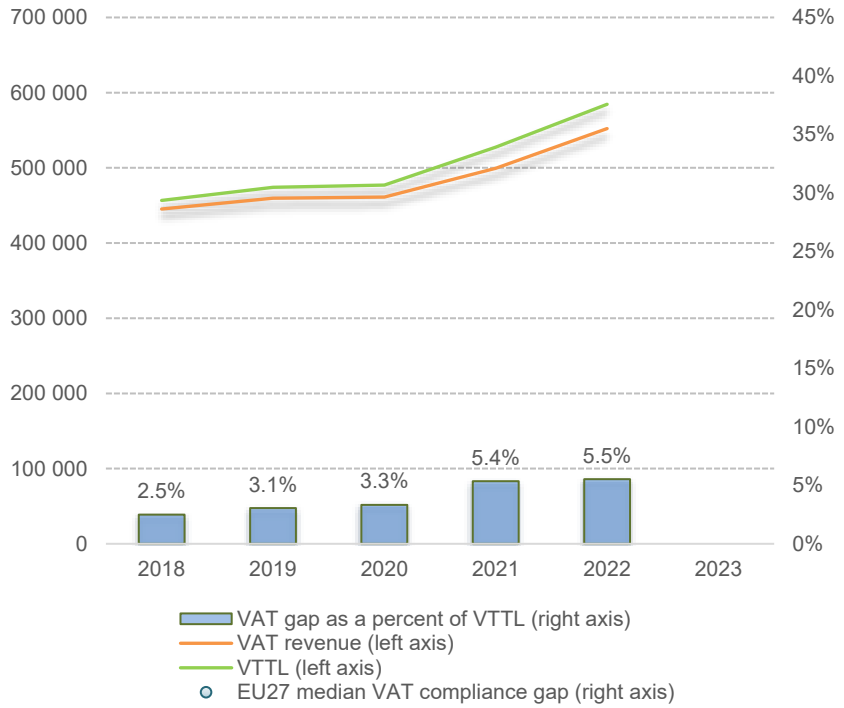
Note: e-commerce figures are based on a percentage, so only percentage point figures are provided. The custom services aggregate comprises recreational and cultural services, package holidays, eating out, accommodation services, personal goods and services, and other services not elsewhere classified.

Source: Eurostat, Tourism Economics and Oxford Economics.

Table 88:SE: VAT compliance gaps, VAT receipts, composition of VTTL (SEK million, 2018–2023)

	2018	2019	2020	2021	2022	*2023*
VTTL	**456 649**	**474 202**	**477 030**	**527 612**	**584 550**	*X*
o/w liability on household final consumption	234 683	241 310	237 514	268 906	295 473	
o/w liability on gov. and NPISH final consumption	18 744	20 158	19 982	21 262	22 275	
o/w liability on intermediate consumption	109 023	114 964	117 480	125 696	138 465	
o/w liability on GFCF	90 857	94 371	99 529	109 082	125 368	
o/w net adjustments	3 342	3 399	2 525	2 666	2 968	
VAT revenue	**445 241**	**459 699**	**461 132**	**499 361**	**552 246**	*X*
VAT compliance gap	**11 408**	**14 503**	**15 898**	**28 251**	**32 304**	
VAT compliance gap (% of VTTL)	**2.5%**	**3.1%**	**3.3%**	**5.4%**	**5.5%**	*X*
VAT compliance gap change since 2018					**+3.0 pp**	

Figure 114: SE: VAT compliance gap, VAT revenue, and VTTL[59]



Source: own calculation, download underlying data.

Highlights

- The VAT compliance gap in Sweden has remained one of the lowest and most stable in the EU.
- In 2022, the VAT compliance gap remained nearly unchanged at 5.5% of the VTTL.
- The fast estimates of the VAT compliance gap for Sweden for 2023 are not published in this report due to uncertainty over the effective rate calculation for the year.

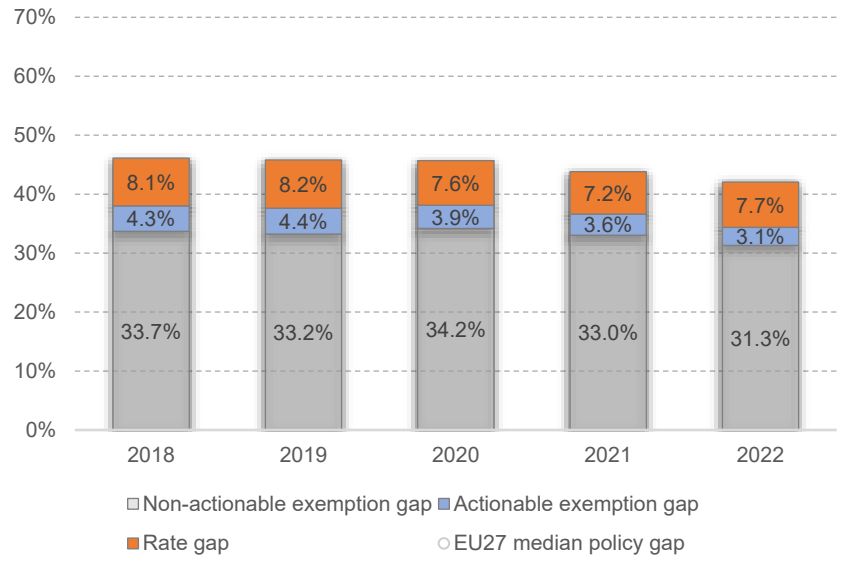
Assessed reliability of estimates:

[59] *The accuracy of the estimates for 2023 is lower as these estimates are based on a simplified methodology and more aggregate data.*

Table 89: SE: VAT policy gap and its components (SEK million, 2018–2022)

	2018	2019	2020	2021	2022
VAT policy gap	**390 519**	**400 815**	**401 347**	**411 321**	**424 028**
Exemption gap	322 004	329 174	334 859	343 969	346 604
o/w imputed rents	39 483	41 249	41 322	38 607	38 377
o/w public services	221 202	226 290	231 951	243 533	248 322
o/w financial services	*24 721*	*23 347*	*26 941*	*28 129*	*28 940*
Rate gap	**68 516**	**71 641**	**66 488**	**67 353**	**77 424**
o/w agricultural products, foodstuffs, beverages	30 591	31 705	33 490	33 791	36 263
o/w pharmaceuticals	4 666	4 527	5 234	5 003	5 164
o/w transport services	12 728	12 874	7 278	7 932	10 652
o/w accommodation and restaurant services	13 174	13 560	11 640	12 464	16 124
o/w utilities	0	0	0	0	0
o/w other	7 357	8 974	8 846	8 162	9 221
Actionable policy gap	**105 113**	**109 929**	**101 133**	**101 052**	**108 389**
C-efficiency (%)	**59.7%**	**59.6%**	**59.9%**	**60.7%**	**62.9%**
Statutory standard VAT rate			**25%**		
Actionable standard VAT rate	**19.8%**	**19.9%**	**20.0%**	**20.4%**	**20.5%**

Figure 115: SE: VAT policy gap, rate gap, and exemption gap



Highlights

- The VAT policy gap has followed a negative trend since 2018. While the rate gap remained broadly stable, the exemption gap decreased by about 3.5 pp between 2018 and 2022.
- If the actionable exemptions and reduced rates were discontinued, the current VTTL could be achieved with a statutory standard rate of 20-21%.

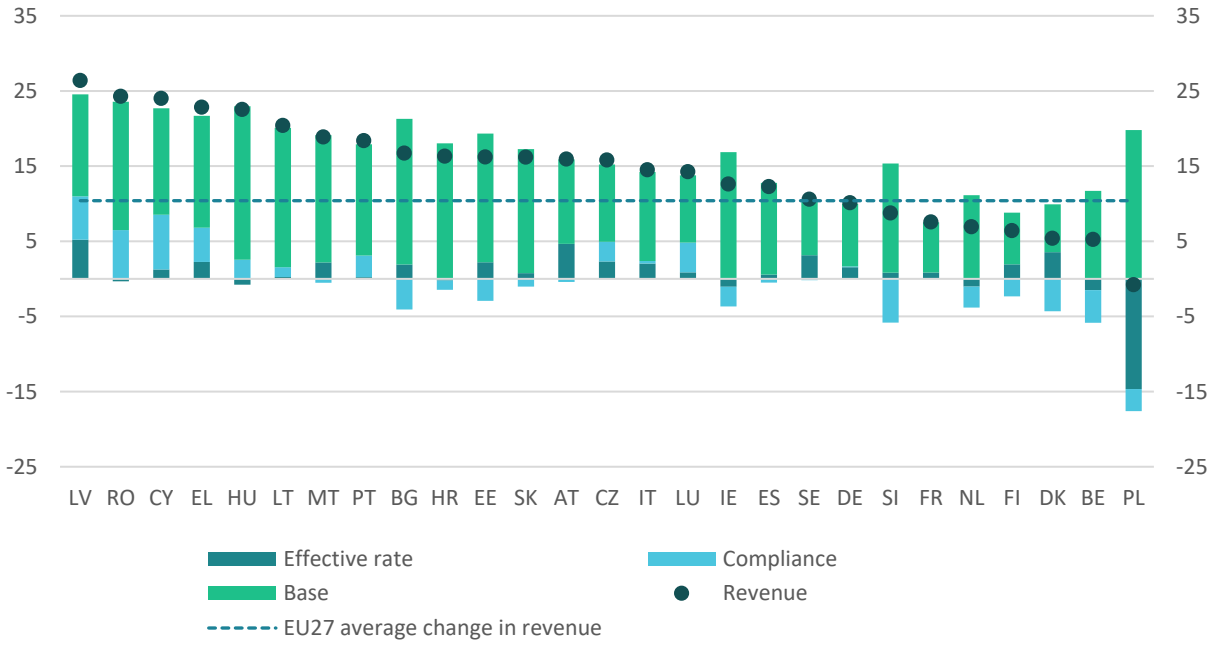
Source: own calculation, download underlying data.

VI. Changes in VAT revenue components

In 2022 the estimated value of VTTL increased by 10.9% on average across the EU27 Member States. The main driver for this increase was a change in the tax base (average increase by 10.4%), observed in every Member State. The effect of the effective tax rate changes was far smaller; on average it increased by 0.4 percentage points compared to 2021. The effective rate dropped in seven of the Member States: Belgium, Ireland, Croatia, Hungary, the Netherlands, Poland and Romania. This drop was particularly significant in the case of Poland, where the effective rate fell by 14.7%. Such a significant drop was a consequence of wide VAT cuts (particularly on food items, gasoline, natural gas and electricity), introduced as anti-inflation measures. As a result, Poland was also the only country where nominal VAT revenue was lower in 2022 than in 2021.

As discussed in Section III, the overall effect of VAT compliance in the EU27 was negative. On average, the VAT compliance gap ratio dropped by 0.4 percentage points in 2022 (equivalent to a drop in the VAT compliance gap of the same magnitude).

Figure 116: Change in actual VAT revenue components (in %, 2022 vs. 2021)



Source: own elaboration, download underlying data.

Table 90: Change in actual VAT revenue components (in %, 2022 vs. 2021)

Member State	Change in revenue (%)	Change in the VTTL (%)	Change in tax base (%)	Change in effective rate (%)	Change in compliance ratio (%)
Belgium	5.3	10.0	11.7	-1.5	-4.3
Bulgaria	16.7	21.7	19.4	1.9	-4.1
Czechia	15.8	12.9	10.3	2.3	2.6
Denmark	5.4	10.1	6.4	3.5	-4.3
Germany	10.1	10.0	8.3	1.6	0.1
Estonia	16.2	19.7	17.1	2.2	-2.9
Ireland	12.6	15.6	16.9	-1.1	-2.6
Greece	22.8	17.5	14.9	2.3	4.6
Spain	12.3	12.8	12.2	0.6	-0.5
France	7.6	7.6	6.7	0.8	0.0
Croatia	16.3	17.8	18.0	-0.2	-1.2
Italy	14.5	14.1	11.8	2.0	0.4
Cyprus	24.0	15.6	14.2	1.3	7.3
Latvia	26.4	19.5	13.6	5.2	5.8
Lithuania	20.4	18.8	18.5	0.2	1.3
Luxembourg	14.2	9.9	9.0	0.9	3.9
Hungary	22.5	19.5	20.4	-0.8	2.5
Malta	18.9	19.5	16.9	2.2	-0.5
Netherlands	6.9	10.0	11.1	-1.0	-2.8
Austria	15.9	16.4	11.2	4.7	-0.4
Poland	-0.8	2.2	19.8	-14.7	-2.9
Portugal	18.4	15.1	14.8	0.2	2.9
Romania	24.3	16.7	17.1	-0.3	6.5
Slovenia	8.8	15.5	14.5	0.8	-5.8
Slovakia	16.2	17.4	16.5	0.8	-1.0
Finland	6.4	8.9	6.9	1.9	-2.3
Sweden	10.6	10.8	7.4	3.1	-0.2
EU27 (average)	**10.4**	**10.9**	**10.4**	**0.4**	**-0.5**

Source: own calculation, download underlying data.

VII. Methodology

VII.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. This approach has relatively low data requirements, making it one of the most popular methods; it can be applied in many countries with the main condition being available, up-to-date, and accurate national accounts figures. Strengths of the method are its simplicity, being able 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 compliance 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), that is, 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 former is estimated based on the VAT compliance gap estimates for the core period (2018–2022) 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, for example, due to 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 VAT compliance gap is expressed in absolute terms (1) or in relation to the benchmark, that is, 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):

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

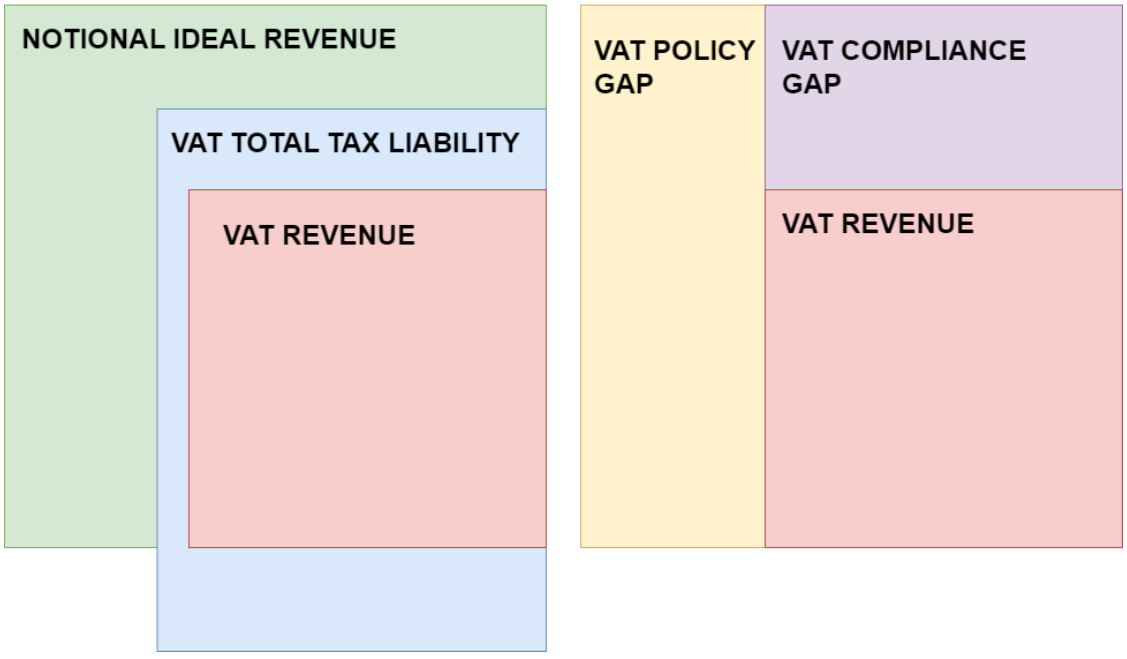
$$VAT\ policy\ gap\ (\%) = \frac{notional\ ideal\ revenue - VTTL}{notional\ ideal\ revenue} \quad (4)$$

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 one 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 117). As shown by Figure 117, 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 118).

Figure 117: Components of the notional ideal revenue



Source: own elaboration.

VII.b. Estimation of the VTTL

The VTTL is estimated as the sum of the liability from six main components: final consumption by households (HHC), by government (GOV), and by non-profit institutions serving households (NPISH); intermediate consumption (IC); gross fixed capital formation (GFCF); and other, largely country-specific, adjustments, such as 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[60] 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):

$$VTTL = \sum_{i=1}^{N}(HHC\ VAT\ rate_i \times HHC\ value_i) + \sum_{i=1}^{N}(GOV\ VAT\ rate_i \times GOV\ value_i) + \sum_{i=1}^{N}(NPISH\ VAT\ rate_i \times NPISH\ value_i) + \sum_{i=1}^{N}\sum_{j=1}^{M}\left(IC\ VAT\ rate_i \times Propex_j \times IC\ value_{i,j}\right) + \sum_{i=1}^{N}\sum_{j=1}^{M}\left(GFCF\ VAT\ rate_i \times Propex_j \times GFCF\ value_{i,j}\right) + net\ adjustments \quad (5)$$

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.[61] This 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 purchase prices, thus requiring correction for the included

[60] *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.*

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

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, 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 purchase 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, that is, 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); and (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 91). For other years, the primary source of information on the tax rules and the structure of the tax base were the Own Resource Submissions.[62] 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.

Table 91: 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.*

[62] *"Own Resource Submissions" were 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 contained 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 were included. The fact that since 2022, the Own Resource Submissions are not available anymore is due to the amendments introduced by Council Regulation (EU, Euratom) 2021/769 of 30 April 2021 amending Regulation (EEC, Euratom) No 1553/89 on the definitive uniform arrangements for the collection of own resources accruing from Value Added Tax.*

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.

VII.c. VAT policy gap and its decomposition

Historically, the notion of VAT policy gap evolved from the broader measure of C-efficiency (see Section VII.e), which is an indicator of departure from VAT levied at a uniform rate on all consumption – and importantly, under the assumption of perfectly enforced tax. As shown by Keen (2013), the C-efficiency originating in Ebrill et al. (2001) could be decomposed into what we call the VAT compliance gap and the VAT policy gap.

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).[63] 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 two amounts: what would have been obtained in a counterfactual situation – where the standard rate 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).

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

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):

$$VAT\ policy\ gap = notional\ ideal\ revenue - VTTL \tag{7}$$

$$VAT\ rate\ gap = VTTL^R - VTTL \tag{8}$$

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

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 for attributing to either exemptions or reduced rates.

The counterfactual VTTL^R assuming the discontinuation of reduced rates 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 VAT 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.[64]

Similarly, the counterfactual $VTTL^E$ assuming the discontinuation of exemptions and the introduction of VAT to all components of the notional ideal revenue can be calculated as follows:

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

where:

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

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

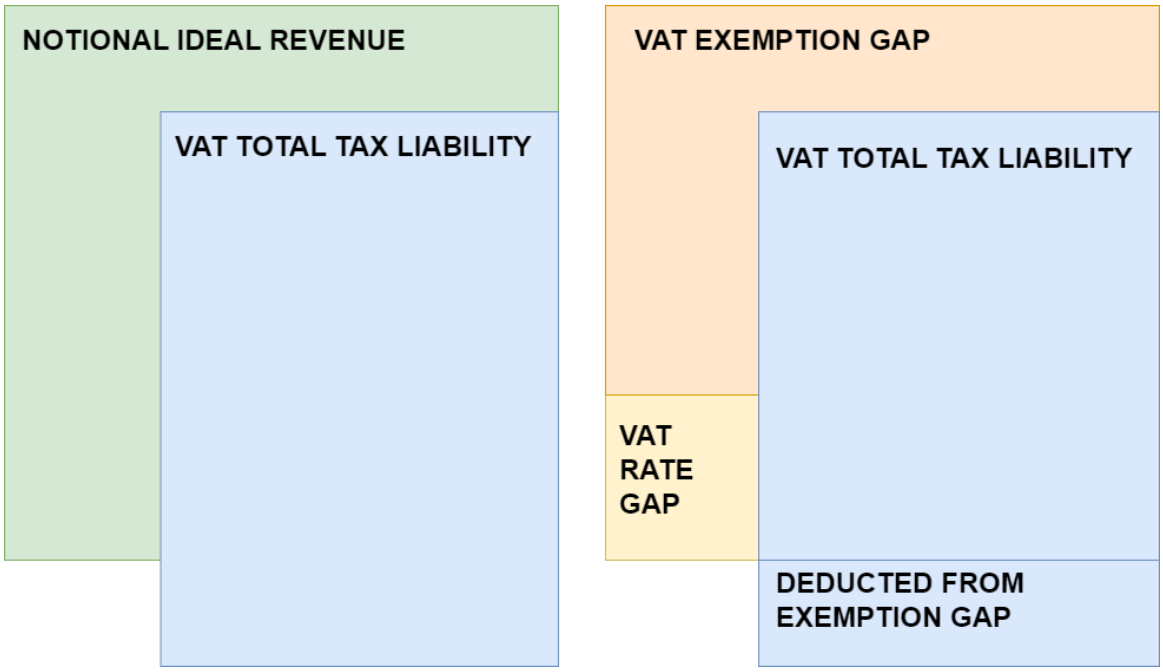
$HHC/GOV/NPISH/GFCF\ VAT\ rate_i^E$ – stand for average VAT rates for product group *i* for household, government, NPISH, and GFCF, respectively, in the situation when exemptions without the right to deduct are terminated and VAT registration thresholds are abandoned. It is assumed that $GFCF\ value_{i,j}$ 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).[65]

The nature of the VAT rate gap and VAT exemption gap differs, as visualised by Figure 118. 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. However, the revenue collected instead at the final stage would be higher. As shown previously in Figure 117, the VAT policy gap, meaning the sum of the rate and exemption gaps, equals the difference between the notional ideal revenue and the VTTL.

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

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

Figure 118: 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 policy gap and non-actionable gap, as well as the components of both, so that the VAT policy gap could be decomposed as follows (12):

$$VAT\ policy\ gap = actionable\ VAT\ policy\ gap + nonactionable\ VAT\ policy\ gap =$$

$$= VAT\ rate\ gap + \ actionable\ VAT\ exemption\ gap + nonactionable\ VAT\ exemption\ gap \quad (12)$$

The intrinsic objective of the actionable policy gap was to exclude (from the overall policy gap measure) the services and notional values that are unlikely to be taxed because of practical reasons and limitations in imposing VAT on the notional tax base. Thus, the actionable VAT liability takes out the liability from the final consumption of "imputed rents" (the notional value of home occupancy by homeowners), the provision of public goods and services (non-market transactions), and financial services.[66] It was decided that for these specific groups of services, charging VAT was either impractical or was going beyond the control of national authorities (i.e. imposing VAT would not meet the provisions of the Directive).

While the imputed rents, public goods and services are believed to be fully outside of the scope of the VAT regime, the treatment of the financial and insurance services should be regarded as mixed. Currently, as shown by the average estimates of the propex coefficient and the respective effective VAT rates, the vast majority of the financial and insurance services supplied in the EU Member States are exempt. The exemptions allowed by the Title IX of the VAT Directive cover:

[66] *Public services and imputed rents are the major non-market transaction components of household final consumption. The actionable policy gap does not exclude own consumption, as the value of this component was excluded from the notional ideal revenue.*

a) Insurance and reinsurance transactions, including related services;

b) The granting and negotiation of credit and the management thereof by the person granting it;

c) The granting and negotiation of credit guarantees or any other security for money and the management thereof by the person granting it;

d) Transactions and negotiations concerning deposits and current accounts, payments, transfers, debts, cheques, and other negotiable instruments (excluding debt collection);

e) Transactions and negotiations of currency, bank notes and coins (excluding coins not used as legal tender or of numismatic interest);

f) Transactions and negotiations of shares, interests in companies or associations, debentures and other securities (excluding the safekeeping and management thereof, and excluding shares in immovable properties);

g) The management of collective investment funds, as defined by Member States.

At the same time, in most cases, there is no right of deduction for the VAT paid on inputs purchased for their provision. The input VAT can only be deducted in relation to financial and insurance transactions whose customers are established outside the EU or directly related to goods to be exported out of the EU. The scope of exemptions enumerated by the Directive is "optional" as Member States have the possibility of taxing certain e-services. The so-called option to tax allows providers of financial services to charge VAT on the services (b)-(g) from the list above (excluding insurance). This means that Member States have no means to impose the standard VAT treatment on all financial and insurance services, which is the reason why financial and insurance services are not treated as "actionable" for the purpose of this study.[67]

To enhance understanding of the contribution of different components to both the actionable policy gap and non-actionable policy gap estimates, we have introduced breakdowns in addition to those in previous studies. The new elements include a further breakdown of the "public services" component of the non-actionable exemption gap into education, healthcare, and other services (mostly public administration). This breakdown may help estimate the magnitude of VAT revenue that could be expected if these services were privatised, taxed at the standard rate, and assuming full compliance.

Importantly, due to the unavailability of information on exempt GFCF in such granular detail, the value of exempt GFCF available at the institutional sector level had to be further broken down. For this purpose, the exempt GFCF was proportionally allocated using information on GFCF by sector of economic activity from Eurostat. [68]

Additionally, we also broke down the rate gap into six components: (1) agricultural products, foodstuffs, and beverages (CPA: A01, A03, C10-12); (2) pharmaceuticals (CPA: C21); (3) transport services (CPA:

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[67] *Despite the inability to tax insurance services under the VAT regime in the EU, the practical limitations of this could be circumvented, as demonstrated by China's example. In China, VAT has recently been gradually introduced to various financial and insurance services. Currently, the VAT regime covers direct financial services, insurance services, and financial product trading (taxed at a 6 percent rate). As shown by China and some other GST/VAT regimes (like Australia, Canada, RSA, and New Zealand), fee-based financial and insurance services could easily be taxed. The practical limitations of taxing financial services were mostly considered to be related to interest-based financial services. The exemption relating to these services was frequently justified by the difficulty in defining the appropriate consideration (i.e. output price) or the inappropriateness of taxing risks priced in interest or high-frequency trading. One of the solutions may be the "Profit-Plus Method" applied in Sri Lanka, i.e. VAT Liability is calculated as net profit before income tax less economic depreciation plus book depreciation and labour costs.*

[68] *Eurostat: nama_10_a64_p5.*

H49-52); (4) accommodation and restaurant services (CPA: I); (5) utilities (CPA: D35, E36-39); and (6) other.

The composition of the VAT exemption gap varies widely across countries, incorporating unique elements such as the non-taxability of small enterprises, revenue losses from special regimes in certain regions, and other specific derogations. Further research is required to analyse the breakdown of this component of forgone revenue.

VII.d. Actionable standard VAT rate

To depict better the understanding of the impact of exemption and reduced rates, this study includes an additional component not presented earlier, which we introduce as the actionable standard VAT rate. This rate equalizes the current VTTL in a counterfactual situation if the exemptions and reduced rates behind the actionable VAT policy gaps were repealed:

$$\begin{aligned} &Actionable\ standard\ VAT\ rate \times \sum_{i=1}^{N} FC\ value_i \\ &= \sum_{i=1}^{N} (HHC\ VAT\ rate_i \times HHC\ value_i) \\ &+ \sum_{i=1}^{N} (GOV\ VAT\ rate_i \times GOV\ value_i) + \sum_{i=1}^{N} (NPISH\ VAT\ rate_i \times NPISH\ value_i) \\ &+ \sum_{i=1}^{N} \sum_{j=1}^{M} \left(IC\ VAT\ rate_i \times Propex_j \times IC\ value_{i,j}\right) \\ &+ \sum_{i=1}^{N} \sum_{j=1}^{M} \left(GFCF\ VAT\ rate_i \times Propex_j \times GFCF\ value_{i,j}\right) \end{aligned}$$

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,

FC Value stands for total final consumption value.

(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. These rates are calculated assuming that all actionable subcomponents of the tax base are taxed at standard rate, where the non-actionable components are not taxable.

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

VII.e. 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:

$$E^C = \frac{VAT\ revenue}{tC} \quad (12)$$

where, *VAT revenue* stands for VAT revenue (ESA 2010 standard), *t* for statutory standard rate, and *C* for the tax base. As the base, the literature usually considers entire final consumption (household, government and NPISH, net of VAT) despite the fact that only a fraction of government and NPISH consumption is taxed. Also important to note is that to estimate net consumption values, we deduct actual VAT revenue from gross consumption values. An alternative, deducting the VTTL to net out gross values, could also have its merits, under the assumption that reduction of the VAT burden due to non-compliance is not fully passed on to consumers and goods' final prices. However, in order to maintain compatibility with other studies, VAT revenue was used instead of the VTTL.

The values of the measure could range from zero to one. However, values larger than 65% 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.[69] In other words, if C-efficiency equalled one, revenue would be higher than the notional ideal revenue.

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

LIST OF TABLES

LIST OF GRAPHS

List of acronyms and abbreviations

B2B	Business-to-Business
B2C	Business-to-Consumer
C2C	Consumer-to-Consumer
C-efficiency	Collection efficiency
CASE	Center for Social and Economic Research (Warsaw)
COICOP	Classification of Individual Consumption according to Purpose
COVID-19	Coronavirus Disease of 2019
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
CZK	Czech Krones
DESI	Digital Economy and Society Index
DG BUDG	Directorate-General for Budget
EKÁER	Electronic Public Road Trade Control System
EC	European Commission
ePG	(hu.) e-pénztárgép
ESA	European System of Accounts
ESTAT	Eurostat, the statistical office of the European Union
ETC	European Travel Commission
EU	European Union
EU27	Current Member States of the European Union, UK exclusive
EU28	Member States of the European Union until January 2020 (including the UK)
FAQ	Frequently Asked Questions
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GOV	Government Final Consumption
GVA	Gross Value Added
GTS	Global Travel Service
HBS	Household Budget Surveys
HHC	Household Final Consumption
IC	Intermediate Consumption
IMF	International Monetary Fund
KSeF	National e-Invoicing System, Poland
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
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

NSI, NSO	National Statistical Institute, National Statistical Office
NTO	National Tourism Offices
OECD	Organisation for Economic Co-operation and Development
ORS	Own Resource Submissions
PEPPOL	Pan-European Public Procurement OnLine
POS	Point of Sales
pp	percentage points
PSP	Payment Service Providers
R&D	Research and Development
SAF-T	Standard Audit File for Tax
SDI	Spatial Data Infrastructure
SENT	(pl.) *System Elektronicznego Nadzoru Transportu*
SME	Small and Medium Enterprises
SPACE	Study on Payment Attitudes of Consumers in the Euro area
STIR	(pl.) *System Teleinformatyczny Izby Rozliczeniowej*
SUT	Supply and Use Tables
TSE	Technical Security Devices
TOMS	Tour Operators Margin Scheme
VAT	Value Added Tax
VTTL	VAT Total Tax Liability
WEF	World Economic Forum
WTTC	World Travel and Tourism Council

Glossary

Actionable VAT exemption gap – theoretical VAT revenue loss due to the application of VAT exemptions that are theoretically possible to discontinue. Usually denoted as a percentage of the notional ideal revenue or in nominal terms.

Actionable VAT policy gap – theoretical VAT revenue loss due to the application of those VAT exemptions that are theoretically possible to discontinue, or due to VAT rate reductions. This is the sum of the actionable VAT exemption gap and the VAT rate gap. Usually denoted as a percentage of the notional ideal revenue or in nominal terms.

Missing trader intra-Community (MTIC) fraud – a specific type of VAT fraud that exploits the fact that the intra-Community movement of goods and services is VAT-free, making the VAT fraud even more profitable.

Notional ideal revenue – benchmark VAT revenue that assumes perfect taxpayer compliance, with VAT imposed on all final consumption and household, government, and NPISH investment given the current standard VAT rate.

VAT compliance gap – revenue loss due to taxpayer non-compliance. This represents the difference between the VAT revenue that would be collected if all taxpayers were compliant and the actual VAT revenue. This difference includes a wide range of forgone receipts, from legal exploitation of tax system loopholes to evasion and organized large-scale tax fraud. Non-compliance can also be unintentional, resulting from administrative errors, omissions, non-fraudulent bankruptcies, and other factors.

VAT exemption gap – theoretical VAT revenue loss due to the application of VAT exemptions and the non-taxability of some components of the notional ideal revenue. Usually denoted as a percentage of the notional ideal revenue or in nominal terms.

VAT policy gap – 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). Usually denoted as a percentage of the notional ideal revenue or in nominal terms.

VAT rate gap – theoretical VAT revenue loss due to the application of a reduced VAT rate. Usually denoted as a percentage of the notional ideal revenue or in nominal terms.

VAT Total Tax Liability (VTTL) – the tax revenue that would be collected in the case of perfect taxpayer compliance, assuming an unchanged net VAT base.

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Annexes

Annex A. Methodological appendix

VAT compliance gap fast estimates for 2023

The methodology used to derive fast estimates, for which fully-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 fully-fledged estimates for the 2018–2022 period. The methodology for deriving fast estimates shall be regarded as an extrapolation of the main liability components of the fully-fledged estimates derived for 2021. In the estimation it will be assumed that:

- The 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 Eurostat.
- 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 ($VR = VTTL - VAT\ compliance\ gap$), 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:

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

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: 2000–2017

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 2000–2021. However, due to revisions triggered by new information available, the estimates from the 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 16 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 a 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 of 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 2000–2017 included in this study rely on the ten studies published between 2013 and 2023 but are adjusted to the magnitude of the full estimates for 2018–2022.

Sources of revisions for the 2021 estimates

The nominal revision of EUR 15.3 billion to the VAT compliance gap can be broken down into four main factors: (1) revisions to the underlying national accounts data; (2) updates and methodological refinements to the forecast of household consumption structure; (3) revisions of revenue data (both from Eurostat and additional adjustments provided by Member State administrations); and (4) revisions to the model parameters, resulting from both methodological changes and newly available information (see Table 92).

Table 92: Sources of revisions for the 2021 VAT compliance gap estimates (EUR million)

	Total revision	o/w national accounts background data	o/w forecasting method	o/w revenue	o/w parameters/model
DE	**4 533**	5 621	-386	-50	-653
NL	**3 770**	4 712	0	0	-942
ES	**2 862**	2 365	0	1	496
FR	**2 287**	-247	1 487	-619	1 665
PL	**1 249**	51	375	0	824
SE	**849**	-60	743	0	166
FI	**632**	208	0	0	424
HR	**477**	303	31	0	143
SK	**303**	12	113	0	179
LU	**262**	118	4	161	-21
IT	**154**	1 618	1 695	0	-3 159
LV	**103**	22	0	-26	106

	Total revision	o/w national accounts background data	o/w forecasting method	o/w revenue	o/w parameters/model
PT	**96**	134	0	-78	40
LT	**80**	78	-25	0	26
SI	**72**	83	0	2	-13
HU	**49**	-89	0	0	138
BE	**45**	-194	189	70	-20
EE	**5**	-11	16	0	0
MT	**-3**	-27	-2	0	26
EL	**-21**	424	-5	-218	-223
CY	**-53**	-61	3	0	5
AT	**-66**	-31	171	12	-218
CZ	**-71**	0	0	-6	-65
BG	**-88**	-85	-29	0	26
DK	**-182**	-93	32	-154	33
RO	**-710**	-769	205	0	-145
IE	**-1 295**	-1 295	0	0	0
TOTAL	**15 338**	**12 788**	**4 617**	**-905**	**-1 162**

Source: own elaboration.

Limitations and challenges of the top-down approach

Table 93: Limitations and challenges of the top-down VAT compliance 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. However, the methodological approach taken by the statistical authorities, meaning 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 respective VAT revenue elements, the consumption-side approach also does not provide any information about types of irregularities or their scale.

Limitations and challenges	Impact on the accuracy of estimates and means to address the challenge
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. However, due to limitations in 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.

Methodological and operational approach to expert interviews

For Case Studies 1 and 2, we conducted expert interviews to gain additional qualitative insights to complement our descriptive and quantitative findings. Since most experts interviewed deal directly with VAT collection efficiency in practice, they can provide useful insights into practical challenges and opportunities that might not be obvious from a theoretical perspective.

In the first step, we selected a list of interview candidates for the case studies. Candidates were chosen based on their qualifications and professional roles. We aimed to choose candidates who were (i) closely involved with businesses and day-to-day operations, enabling them to discuss practical aspects, and (ii) still engaged with the topic from an industry-wide perspective, allowing them to address general findings and sectoral differences. Additionally, we reviewed whether they had made public statements or published materials on the subject.

Next, we contacted the selected interview candidates via email. For those who agreed to participate, we scheduled a 60-minute virtual meeting. Candidates who did not respond received a reminder email approximately two weeks after the initial invitation. Typically, three individuals participated in the interviews: the expert, the interviewer, and a note-taker. Additionally, all interviews were recorded as a backup for the notes, provided the expert consented. The interview followed a questionnaire with guiding questions, but was flexible enough to adapt to the specific expertise of the participant. After each interview, we prepared a summary highlighting the key messages. Opinions and insights that emerged repeatedly across multiple interviews were then selected and used to guide further desk and literature research.

Case Study 1

For Case Study 1, we reached out to 16 interview candidates, of whom six agreed to be interviewed. For the first part of Case Study 1 on "*Compliance in the tourism and hospitality sector during the COVID-19 pandemic",* we conducted two interviews. One was held with a representative of a travel booking platform. The other was held with a member of an association for the tourism and hospitality industry. The guiding questionnaires included information about the interviewee and the business or association they worked for. We asked the interviewee to recap the years around the COVID-19 pandemic from the tourism sector's perspective, and whether they felt any of the implemented measures had been

particularly effective. We also asked VAT compliance-related questions concerning the state and development of VAT compliance in the tourism and hospitality sector, what factors they thought drove compliance across countries, and how compliance could be improved. Moreover, we shared Figure 20 with the experts and discussed the composition hypothesis with them.

For the second part of Case Study 1 on "*Compliance in Germany",* we held four interviews with different German associations representing different economic sectors, such as skilled crafts covering construction. The guiding questionnaires concerned the experts themselves and the associations they represented, the impact of the COVID-19 pandemic on businesses in their respective trade associations, and their evaluation of government support programmes (specifically the VAT rate reduction). They were further asked to assess the impact that VAT obligations had on businesses in the sectors they represented, and what issues there were with compliance. We also presented Figure 24 to the interviewees and asked them to share their thoughts and possible explanations for the development of the VAT compliance gap.

Case Study 2

For Case Study 2 we sent 49 interview requests. These resulted in eight expert interviews and two written answers based on the guiding questionnaire. Six of these involved experts from Romania, two were conducted with experts from Hungary, and another two with experts from Poland. Besides businesses and business representatives, we also approached stakeholders from public authorities – such as employees of the Ministry of Finance and tax (collecting) authorities – to gain a holistic understanding of the country's context. In each of the countries, i.e. Romania, Hungary, and Poland, we interviewed at least one expert working for a state institution.

A guiding questionnaire structured the interviews. It contained questions about the experts themselves and their occupational position, their assessment of the main determinants of the VAT compliance gap in their country, as well as their evaluation of what they considered to be the most important policy measures introduced to reduce the VAT compliance gap and their impact on businesses. Specific questions on selected policy measures were asked, but mostly not answered.

Annex B. Data availability and reliability

Data availability

As discussed in Annex A, the *VAT gap in the EU* study relies on a combination of variables published by Eurostat and data provided by the Member States' administration. The availability and quality of data from both of these sources play a crucial role in accurate estimation of the VAT compliance and policy gaps. This section presents the availability of data from Member State administrations at the moment when the preliminary estimates were obtained (see Table 94).

1) **Submission with high data completeness and granularity:** Belgium, Bulgaria, Czechia, Cyprus, Spain, Greece, France, Italy, Lithuania, Latvia, Hungary, the Netherlands, Slovenia, Slovakia, Finland and Sweden (15 MS) shared granular and complete data with an approximate level of completeness ranging from 75% to 100% across all categories of data.[70] Most of these submissions contained full information on weighted average rates applicable to household final consumption, propexes and GFCF data but in some cases the information necessary to calculate net adjustments was often incomplete.

2) **Submissions with medium data completeness and granularity:** Germany, Ireland, Luxembourg, Romania and Portugal shared data with varying levels of completeness. While they provided a significant portion of the required data, some categories such as GFCF or propex were partially complete or missing in certain instances. However, in the case of Luxembourg, the missing data might still be provided within the next weeks.

3) **No submissions.** The remaining Member States have not as yet submitted any data. Consequently, the preliminary calculations were heavily based on the past estimates and information about changes in rate structure. Subsequent developments indicate ongoing efforts to obtain the necessary information for future *VAT gap in the EU* studies.

[70] *100% completeness would mean that the series answering all requests in the questionnaire at minimum level of required granularity and without gaps were shared.*

Table 94: Submissions received

Country	Data received	Approximate level of completeness	Level of completeness by category of data				Changes in VAT regimes (information)
			Rates	Propex	Net Adjustments	GFCF	
BE	yes	100%	complete	complete	complete	complete	yes
BG	yes	75%	complete	complete	no data/outdated	complete	yes
CZ	yes	90%	complete	complete	partially complete	complete	no
CY	yes	100%	complete	complete	complete	complete	yes
DK	not requested	-	-	-	-	-	no
DE	yes	20%	partially complete	no data/outdated	no data/outdated	no data/outdated	yes
EE	no	0%	no data/outdated	no data/outdated	no data/outdated	no data/outdated	no
IE	yes	60%	complete	complete	no data/outdated	partially complete	yes
EL	yes	100%	complete	complete	complete	complete	yes
ES	yes	100%	complete	complete	complete	complete	yes
FR	yes	100%	complete	complete	complete	complete	yes
HR	no	0%	no data/outdated	no data/outdated	no data/outdated	no data/outdated	no
IT	yes	90%	complete	complete	partially complete	complete	yes
LV	yes	100%	complete	complete	complete	complete	yes
LT	yes	100%	complete	complete	complete	complete	yes
LU	partial	25%	no data/outdated	no data/outdated	no data/outdated	complete	yes
HU	yes	75%	complete	complete	no data/outdated	complete	yes
MT	no	0%	no data/outdated	no data/outdated	no data/outdated	no data/outdated	yes
NL	yes	75%	complete	complete	no data/outdated	complete	yes
AT	no	0%	no data/outdated	no data/outdated	no data/outdated	no data/outdated	yes
PL	no	0%	no data/outdated	no data/outdated	no data/outdated	no data/outdated	no
PT	yes	60%	complete	partially complete	no data/outdated	complete	yes
RO	yes	60%	complete	complete	no data/outdated	no data/outdated	yes
SI	yes	100%	complete	complete	complete	complete	yes
SK	yes	100%	complete	complete	complete	complete	yes
FI	yes	100%	complete	complete	complete	complete	yes
SE	yes	75%	complete	complete	no data/outdated	complete	yes

Source: own elaboration

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

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 the tax base.**
- **Difficulty of compiling and potential inaccuracies in national accounts' statistics.**
- **Temporary changes in tax rates introduced in many Member States.**

To properly reflect 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. However, 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 scrutinised and consulted potential issues with the relevant tax administrations. For a handful of Member States, additional data provided by administrations was used to correct officially published VAT revenue so that the figures used better reflect accruals.

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 the obtained estimates. 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. Whereas 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 such as 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 to 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. Large shifts in estimates therefore require special attention. In the case of no justification for the shifts, the credibility of such estimates could be questioned.

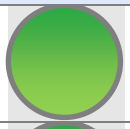
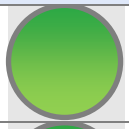
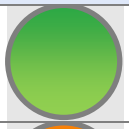
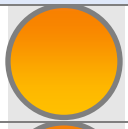
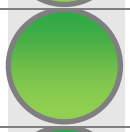
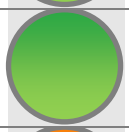
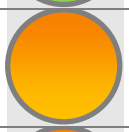
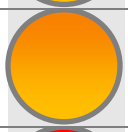
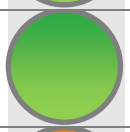
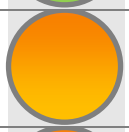
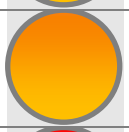
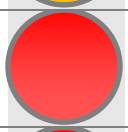
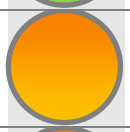
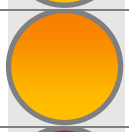
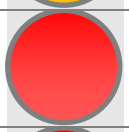
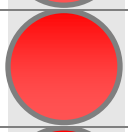
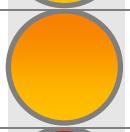
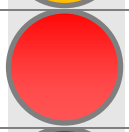
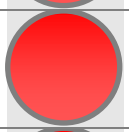
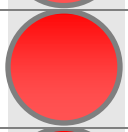
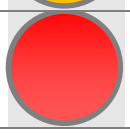
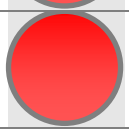
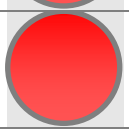
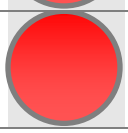
The relative scarcity of large shifts could be summarised by looking at the tails of the distribution of year-over-year changes in the VAT compliance gap:

- **A large incline in the gap.** An increase in the gap of over 5.4 pp year-over-year was observed in only 5% of instances, and an increase of over 11.2 pp – in only 1% of instances.
- **A large decline in the gap.** A decrease in the gap of over 6.4 pp year-over-year was observed in only 5% of instances, and a decrease of over 9.7 pp – in only 1% of instances.
- **One-off hike**. The VAT compliance gap was higher by 5 pp than the average of the values in the preceding and succeeding years in only 7.4% of instances. In 1% of instances, the VAT compliance gap was higher by more than 12.2 pp than the average of the values in the preceding and succeeding years.
- **One-off drop.** The VAT compliance gap was lower by 4.4 pp than the average of the values in the preceding and succeeding years in only 5% of instances. In 1% of instances, the VAT compliance gap was lower by more than 7.4 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 from the estimates derived by national administrations would be marked in yellow or red (regardless of other criteria). The estimates below 0 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 95).

Table 95: Accuracy thresholds for combinations of data unavailability

		Parameters[71]			
		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 the case of multiple problems, an overall assessment was made looking at all the criteria affecting the overall estimate.

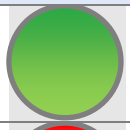
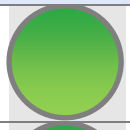
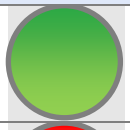
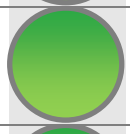
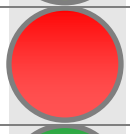
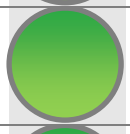
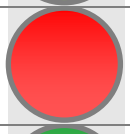
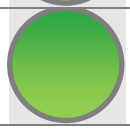
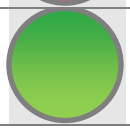
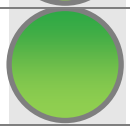
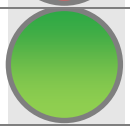
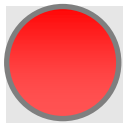
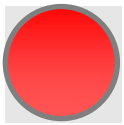
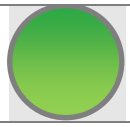
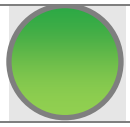
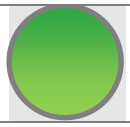
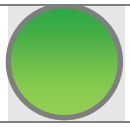
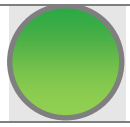
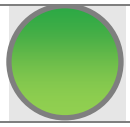
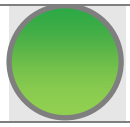
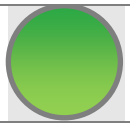
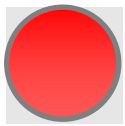
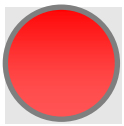
Overall, no significant issues that might have affected the accuracy of the estimates were spotted for 19 Member States (rows marked in green in Table 96).[72] For five Member States, there are signals that the accuracy of the estimates may be somewhat lower (rows marked in yellow in Table 96). For three Member States – Bulgaria, Cyprus and Ireland – problems were encountered of a fundamental nature (rows marked in red in Table 96). For Bulgaria, the most recent use tables were for 2014, which likely had a large impact on the accuracy for most recent years. The estimates for Cyprus for 2022 were negative, and the estimates in the preceding year were volatile, which could not be justified by the actual

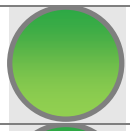
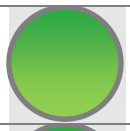
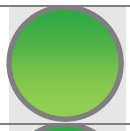
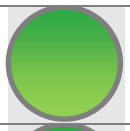
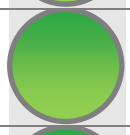
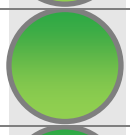
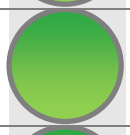
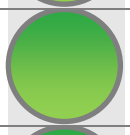
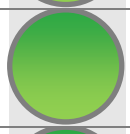
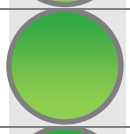
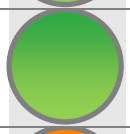
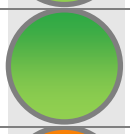
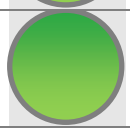
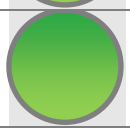
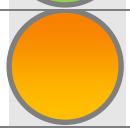
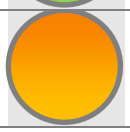
[71] *To reduce complexity, the analysed scenarios of data unavailability assume that all the parameters are available with the same time lag. It may happen that the time lag differs for various parameters. In such a case, the simple average of time lag in groups of parameters could be used as a proxy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

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

events of data supplied by the Cypriot administration. And for Ireland, the estimates for 2021 were negative. Despite the efforts of the administration to supply the information to refine the estimates, they remained negative, which is a clear signal of inaccuracies.

Table 96: Assessment of credibility of VAT compliance gap estimates

	Magnitude of the VAT compliance gap	Data availability	Shifts	Final assessment	Comment
BE					
BG					Most recent use tables available for 2014.
CZ					
CY					Large hike in 2020 and declines in 2021 and 2022, which may be somewhat affected by deferred payments or other elements that were not fully controlled in the modelling. Negative estimates for 2022.
DK					
DE					Outdated information to estimate model parameters that have not yet affected substantially the precision of estimates.
EE					
IE					2018–2020 Use tables (published annually by Central Statistics Office, IE) are updated (rescaling separately each column) to match with latest National Accounts aggregates. 2021 and 2022 SUT tables are forecasted in a similar way on the basis of 2020 use table structure. Partially outdated information necessary to calculate

					model parameters. Negative estimates for 2021.
EL					
ES					
FR					
HR					Large unexplained downward shift in 2019 and rebound in 2020.
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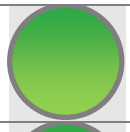
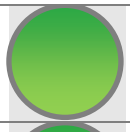
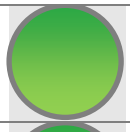
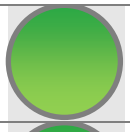
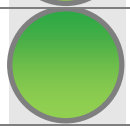
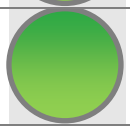
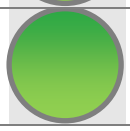
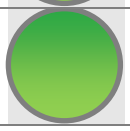
LV					
LT					
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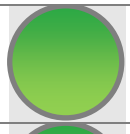
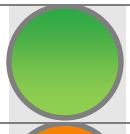
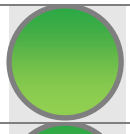
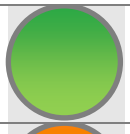
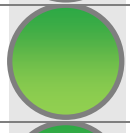
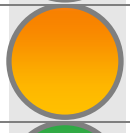
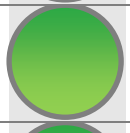
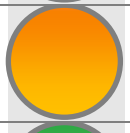
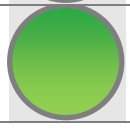
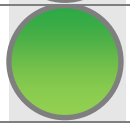
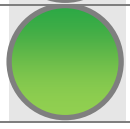
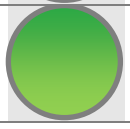
HU					
MT					Most recent use tables available for 2018.
NL					
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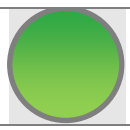
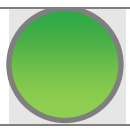
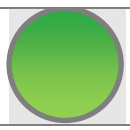
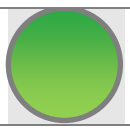
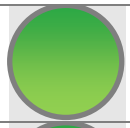
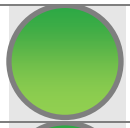
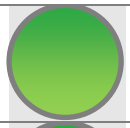
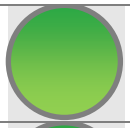
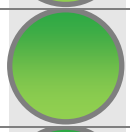
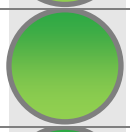
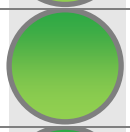
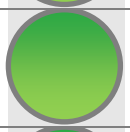
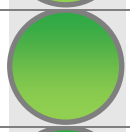
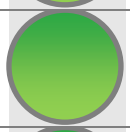
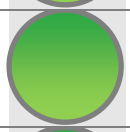
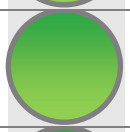
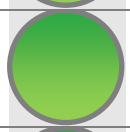
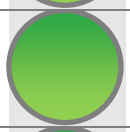
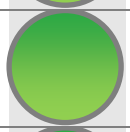
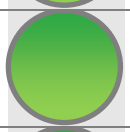
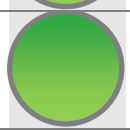
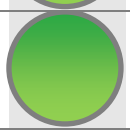
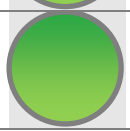
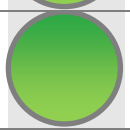
PT					

RO					
SI					
SK					
FI					
SE					

Source: own elaboration.

Annex C. Review, assessment and refinement of the methodological approach

Methodology for refining the treatment of business purchase of accommodation, entertainment, restaurant, passenger transport services, maintenance and purchase of cars

Legal framework

Based on Article 176 of the VAT Directive, VAT is not deductible by businesses on expenses on luxuries, amusement, or entertainment. In addition, Member States may retain limits to deduction of VAT which were in force in 1979 (or the date of accession for Member States which were not part of the EU then). Those limits are designed to prevent fraud, meaning the deduction of VAT incurred on expenses incurred for leisure rather than business purposes. They also apply therefore to goods or

services that may have a dual use (business and leisure, or business and personal), such as accommodation, restaurants[73] or cars (and the services associated with them, such as repairs and refuelling).

Those prohibitions and limitations do not apply when the items are purchased for re-sale (e.g. the purchase of accommodation by travel agents[74]) or, in the services sector, when the purchases concern key inputs (e.g. VAT on the purchase of motor vehicles is deductible by suppliers of passenger transport services). In other words, in many Member States the VAT on the purchase of those goods and services can be deducted by operators in the same industry or value chain, but not when the operator belongs to a different industry.

As shown in Table 97 below, all Member States prohibit or limit the deduction of VAT on some of those goods and services, as well as on others (e.g. alcohol and tobacco). The most common prohibitions or limitations concern the purchase of cars and motor vehicles for passenger use, entertainment and restaurants. Limits and prohibitions can take different forms:

- (Near-)prohibition: VAT on those expenses cannot be deducted at all.
- Quantitative limits: a share (e.g. 50%) of VAT on those expenses cannot be deducted.
- Qualitative rules. VAT on those expenses can be deducted at certain conditions. These may be generic conditions (e.g., VAT is deductible when the expense can be deducted for corporate income tax purposes)[75] or specific (e.g., VAT on purchases of restaurant services can only be deducted for business lunches).[76]
- A combination of the above (VAT on purchases of cars is not deductible, but it can be deducted at 50% for natural gas vehicles and 100% for LPG).[77]

Most of the existing national rules consist in prohibitions, meaning that no VAT (with very limited exceptions) can be deducted; in fewer cases, mostly concerning cars and motor vehicles, there is a quantitative limit to deductibility, often set at 50%. As for qualitative rules, these are very complex for cars and motor vehicles, often depending on the fuel used, the value of the vehicle, and on whether the car is purchased or leased (these rules are labelled as “Partial deduction” in Table 97). For accommodation, restaurant, transport and entertainment, limits are typically qualitative; an assessment of the strictness of the regime is presented in Table 97, and the limits to VAT deduction are classified as negligible, minor, moderate, or major.

[73] *Throughout this section, the term “restaurant” or “restaurants services” includes all provision of food and drink services, including from bars and cafés.*

[74] *VAT cannot be deducted when the accommodation is then used for supplies covered by the TOMS.*

[75] *This clause is found e.g. in Germany and Spain.*

[76] *This clause is found in Luxembourg.*

[77] *Those are some of the rules applicable in France.*

Table 97: Treatment of business purchase of accommodation / restaurant / passenger transport services

	Accommodation	Food and beverage service activities	Entertainment	Passenger Transport	Cars and/or motor vehicles for passenger transport
BE	Major	Major	No deduction	Full deduction	50%
BG	Full deduction	Full deduction	No deduction	Negligible	No deduction
CZ	Minor	Minor	Minor	Minor	Full deduction
CY	Minor	Minor	Minor	Full deduction	No deduction
DK	Full deduction	75% non-deduction	75% non-deduction	Full deduction Full deduction	No deduction
DE	Minor	Full deduction	Full deduction	Minor	Partial
EE	Full deduction	No deduction	No deduction	Full deduction	No deduction
IE	No deduction	No deduction	No deduction	Full deduction	Partial
EL	No deduction	No deduction	No deduction	No deduction	No deduction
ES	Minor	No deduction	Full deduction	Minor	No deduction
FR	No deduction	Full deduction	Full deduction	No deduction	Partial
HR	Full deduction	Moderate	Moderate	Moderate	50%
IT	Full deduction	Full deduction	Full deduction	No deduction	Partial
LV	Full deduction	Full deduction	Full deduction	Full deduction	Partial
LT	Full deduction	No deduction	50%	Negligible	No deduction
LU	Full deduction	Minor	No deduction	Full deduction	Full deduction
HU	Full deduction	No deduction	No deduction	Negligible	No deduction
MT	No deduction	Full deduction	No deduction	Moderate	No deduction
NL	Full deduction	No deduction	Full deduction	Full deduction	Full deduction
AT	Full deduction	Moderate	No deduction	Full deduction	No deduction
PL	No deduction	No deduction	No deduction	Full deduction	50%
PT	No deduction	No deduction	No deduction	No deduction	No deduction
RO	Full deduction	Full deduction	Full deduction	Full deduction	50%
SI	No deduction	No deduction	No deduction	Full deduction	No deduction
SK	Full deduction	Full deduction	Full deduction	Full deduction	Full deduction
FI	Full deduction	Full deduction	Full deduction	Full deduction	No deduction
SE	Full deduction	Moderate	No deduction	Full deduction	No deduction

Source: own elaboration based on VAT Compass, 2023-24, IBFD Eds.

Previous treatment in the VTTL model (general)

The previous version of the VTTL model had a somewhat simplified approach in this respect, assuming that no input VAT can be deducted on accommodation and restaurant services, except by sectors within the value chain (e.g. intra-sector supplies, purchases by travel agents). The model did not cover all groups of goods and services for which limitations exist, in particular passenger transport services (which, however, are exempt or taxed at a reduced rate in several Member States). Also, it did not account for the national variations in deduction rules.

Below we analyse in more detail whether the available data allow for better adaptation of the VTTL model to the rules applicable to deductibility of expenses in different Member States. Due to the differences in the rules and previous treatment in the model, we looked separately at: (1) Accommodation and restaurant services; (2) Entertainment; (3) Passenger transport; and (4) Purchase and maintenance of cars.

Accommodation and restaurant services

Previous treatment in the VTTL model

Previously, the VTTL model assumed that no input VAT could be deducted on accommodation and restaurant services, except by the sectors within the value chain (e.g. intra-sector supplies, purchases by travel agents).

Amendments

We refined the approach to encompass differences in tax treatment in the EU using the algorithm (Table 98):

- Full deduction of VAT is assumed for the Member States in which no limits or prohibitions exist.
- No deduction of VAT is assumed for the Member States in which this is prohibited or nearly prohibited.
- When quantitative limits are set (e.g. 50% deductibility), these are incorporated in the model.
- Qualitative limits are converted into quantitative parameters based on the following conversion scales:

Table 98: Categorisation of non-deductibility ratios

	Share of non-deductibility
Negligible	10%
Minor limitation	20%
Moderate limitation	50%
Major limitation	80%

Source: own elaboration.

Since the VTTL model includes a single category of CPA I that combines accommodation and restaurant services, some further complication needed to be introduced for Member States applying different rules for different subgroups of these services. More specifically, we decided to calculate combined non-deductibility rates for this group of goods and services using turnover statistics of the respective industries available in Eurostat's Structural Business Statistics (*Enterprise statistics by size class and NACE Rev.2*). To the study team's knowledge, this is the most precise information that could be used to proxy total, and in consequence, also intermediate use of these services.

Using this algorithm, we obtained the following non-deductibility rates (Table 99):

Table 99: Estimated non-deductibility rate for accommodation and restaurant services

	Assigned non-deductibility rate		Shares of turnover (within total turnover of accommodation and restaurant services)		Estimated combined non-deductibility rate
	Accommodation	Food and beverage service activities	Accommodation	Food and beverage service activities	
BE	80%	80%	16%	84%	80%
BG	0%	0%	40%	60%	0%
CZ	20%	20%	24%	76%	20%
CY	20%	20%	24%	76%	20%
DK	0%	75%	33%	67%	51%
DE	20%	0%	25%	75%	5%
EE	0%	100%	36%	64%	64%
IE	100%	100%	50%	50%	100%
EL	100%	100%	27%	73%	100%
ES	20%	100%	27%	73%	79%
FR	100%	0%	52%	48%	52%
HR	0%	50%	29%	71%	35%
IT	0%	0%	45%	55%	0%
LV	0%	0%	21%	79%	0%
LT	0%	100%	21%	79%	79%
LU	0%	20%	16%	84%	17%
HU	0%	100%	24%	76%	76%
MT	100%	0%	44%	56%	44%
NL	0%	100%	28%	72%	72%
AT	0%	50%	47%	53%	26%
PL	100%	100%	31%	69%	100%
PT	100%	100%	33%	67%	100%
RO	0%	0%	26%	74%	0%
SI	100%	100%	39%	61%	100%
SK	0%	0%	27%	73%	0%
FI	0%	0%	18%	82%	0%
SE	0%	50%	29%	71%	35%

Source: own calculation based on Eurostat (Enterprise statistics by size class and NACE Rev.2 activity (from 2021 onwards) [sbs_sc_ovw__custom_11044532]).

From the rule described overleaf we exempted the sectors for which purchases of accommodation and restaurant services could, in most cases, be deducted, i.e.:

- NACE I – Accommodation and food service activities (contributing to 14.76% of intermediate use of accommodation and restaurant services in 2019 in the EU)

- NACE N79 – Travel agency, tour operator reservation service and related activities (contributing to 19.08% of intermediate use of accommodation and restaurant services in 2019 in the EU)

Entertainment

Previous treatment in the VTTL model

Previously, the VTTL model assumed there to be no general restrictions on deducting input VAT for expenses related to *Creative, arts and entertainment services; library, archive, museum and other cultural services; gambling and betting services* (CPA R90-92), as well as for *Sporting services and amusement and recreation services* (CPA R93). Such simplified treatment was justified, as it was assumed that most of these services, used as intermediate inputs reported in use tables, are intended for further resale (which makes them deductible).

Amendments

We refined the approach to differentiate the treatment across Member States and purchasing sectors. For the following sectors we maintained full deductibility assuming that all purchases of the above-mentioned sectors of CPA 90-93 are for resale:

- NACE N79 – Travel agency, tour operator reservation service and related activities
- NACE I – Accommodation and food service activities
- NACE J59_60 – Motion picture, video, television programme production; programming and broadcasting activities
- NACE R90-92 – Creative, arts and entertainment services; library, archive, museum and other cultural services; gambling and betting services
- NACE R93 – Sports activities and amusement and recreation activities

Overall, these sectors contributed to approximately 71% of intermediate use of entertainment services, which indicates that the assumption made earlier regarding prevalent deductibility was largely correct. However, there is a scope for improvement that is expected to have a slight positive impact on the estimated VTTL.

Similarly to the treatment of accommodation and restaurant services, for the other sectors we made the following assumptions:

- full deduction of VAT for Member States in which no limits or prohibitions exist
- no deduction of VAT for Member States in which this is prohibited or nearly prohibited
- when quantitative limits are set (e.g. 50% deductibility), these are incorporated into the model

Qualitative limits were converted into quantitative parameters based on the following conversion scales shown in Table 98. The new non-deductibility rates for other sectors are presented below (Table 100).

Table 100: Assessed non-deductibility rate for entertainment services for sectors other than re-sellers (CPA R90-93)

MS	Non-deductibility rate
BE	100%
BG	100%
CZ	20%
CY	20%
DK	75%
DE	0%
EE	100%
IE	100%
EL	100%
ES	0%
FR	0%
HR	50%
IT	0%
LV	0%
LT	50%
LU	100%
HU	100%
MT	100%
NL	0%
AT	100%
PL	100%
PT	100%
RO	0%
SI	100%
SK	0%
FI	0%
SE	100%

Source: own elaboration.

Passenger transport

Previous approach

Previously, the VTTL model assumed there to be no general restriction on deducting input VAT for expenses on passenger transport services gathered under the CPA H49-51 group. The main reason for such an approach was the inability to break up final use between freight and passenger transport for different sectors. As the main component of the intermediate use is freight, the disentangled value of passenger transport services for which VAT could not be deducted would be highly imprecise.

Amendments

As shown by Table 97, “no deduction” or “major non-deduction” for passenger transport services are relatively rare compared to the rules applicable to restaurant, hotel, and entertainment services. The partial information available in the ORS also enables confirmation that the value of potential corrections would be minor, up to 0.04% of the VAT base. Due to the negligible value and lack of information on the sectoral use of passenger transport services, we maintained the current simplified approach.

Purchase and maintenance of passenger cars

Previous treatment in the VTTL model

To correct the VTTL for non-deductible expenses on cars and their maintenance, the study team has used and properly adapted the information coming from the summary statements in the ORS. By these means, we assumed that all passenger cars’ use, and related expenses paid by economic operators, were recorded in the use tables (including the part of use attributed to “private” use).

Amendments

As no detailed information on the value of passenger cars and their maintenance by economic operators is published by Eurostat or other publicly available sources, the information has to come directly from the administration sources from unpublished national accounts data or tax records.

To verify whether the data shared up to date was accurate, we compared the value of this “net-adjustment” with the legal mapping that was conducted (shown in Table 101 below). In most cases, the legal treatment appeared to correlate with the ratio of correction applied. However, for six Member States the value of the correction did not correspond to the legal treatment. For these Member States, we verified and consulted with the administration the potential reasons for these discrepancies, and made adjustments where necessary. The reasons for discrepancy were: (1) lack of relevant data; (2) different treatment of company car purchase in national accounts; and (3) outdated information on legal treatment.

Table 101: Comparison of the legal treatment and correction to the VTTL

	Cars and maintenance	Correction (as % of the VTTL)
BE	50%	0.81%
BG	No deduction	0.53%
CZ	Full deduction	0.00%
CY	No deduction	0.00%
DK	No deduction	1.13%
DE	Partial	0.00%
EE	No deduction	0.00%
IE	Partial	0.57%
EL	No deduction	1.11%
ES	No deduction	0.00%
FR	Partial	1.75%
HR	50%	0.96%
IT	Partial	1.11%
LV	Partial	0.00%

	Cars and maintenance	Correction (as % of the VTTL)
LT	No deduction	0.07%
LU	Full deduction	0.00%
HU	No deduction	1.37%
MT	No deduction	0.62%
NL	Full deduction	0.00%
AT	No deduction	2.50%
PL	50%	1.49%
PT	No deduction	0.93%
RO	50%	2.17%
SI	No deduction	2.05%
SK	Full deduction	0.00%
FI	No deduction	2.54%
SE	No deduction	0.17%

Source: own elaboration.

Validation of model parameters based on legal mapping

Refinement of the treatment of the propex coefficients

Legal framework

As a general principle, VAT can only be deducted on inputs used for taxable supplies, or for exempt supplies with the right to deduct (so-called zero-rated). However, certain supplies are exempt for VAT with no right of deduction; the shares of exempt supply without the right to deduct is measured by propexes. The estimated or assumed values of propexes have a directly proportional impact on the intermediate consumption liability, contributing on average to 19% of the VTTL.[78] In consequence, a 10% imprecision in propexes value would result on average in a 1.9% error in the estimated VTTL and a 1.9 percentage point inaccuracy in the estimates of the VAT compliance gap.

Objective and method

Since propexes are mainly calculated using data provided by Member State administrations every year, the potential remaining inaccuracies are unlikely to result from errors and omissions, but rather from the limitations of the underlying data. The objective of the validation described in this section was to go beyond the checks carried out every year and hence to flag potential problems, communicate them to Member State administrations, and discuss potential solutions.[79]

For flagging potential issues in the value of propexes, the following algorithm was applied:

[78] *Average by Member State and year in the 2017-2021 period. The lowest share observed was ca. 10%, whereas the highest was 41%.*

[79] *At the moment of the submission of this report, all the flagged issues have already been communicated and discussed with Member State administrations. Most of them have already been solved.*

- Only the NACE industries affected by mandatory or optional VAT exemptions were selected for review. This was done by considering the text of the VAT Directive, as well as by looking at the NACE sectors which presented 0 or near-0 propex in at least one Member State.
- The analysis focused on a single year, 2021. Since changes in the parameters over time are thoroughly monitored, there was no need to validate the values for other years. In other words, it is unlikely that the difference between the parameter values over time is the source of inaccuracies.
- For each sector, trends (i.e. modal values or modal range) were identified, together with significant outliers, meaning those with a propex significantly different from the modal values or range.

For outliers, desk research was performed on whether local rules justified the magnitude of the propex. In many cases, this required verifying the scope and conditions for the exemptions; in a few cases, an analysis of the structure and relevance of the industry was required, including the likelihood of cross-border supplies. The research was done on horizontal sources on VAT rates and structure,[80] sectoral studies,[81] as well as online sources provided by local tax administrations or VAT consultants.

Previous treatment in the VTTL model and inconsistencies found

The results of this analysis are presented in Table 102 below.

[80] *This includes the Commission's Taxes in Europe Database, as well as various publications on national VAT rates, structure and rules; cf. also Annacondia, F., & Herrero Moreno, I. (2023), EU VAT Compass 2023/2024, IBFD.*

[81] *e.g. Study on VAT Rules Applicable to the Travel and Tourism Sector, for DG TAXUD, 2022, on file with the author and the Review of the VAT rules for financial and insurance services, for DG TAXUD, 2020, on file with the author.*

Table 102: Results of the propexes' validation (parameters for 2021)

MS	Sector (NACE code and description)	Propex	Reason for outlier	Corrections or further verification	Comments
MT	C21 – Pharmaceutical products	0.87	All other MS = 0	☒	In Malta, supplies of pharmaceutical products are zero-rated; medical accessories are taxed at 5%. Being zero-rated, we would expect a very low propex. Similar treatment, i.e. zero-rating, also applies in Lithuania, where propex is 0.
BG	C28 – Machinery	0.04	All other MS = 0	☒	The desk research shows there to be no VAT exemptions in Bulgaria connected to the production of machinery, but such a low value may mean that the sector is providing some exempt services.
ES	D35 – Electricity	0.02	All other MS = 0	☒	There seem to be no VAT exemptions in Spain connected to the provision of electricity, but such a low value may mean that the sector is providing some exempt services.
IE	E36 – Water Supply	1.00	All other MS = 0	☒	In Ireland, water supplies are VAT exempt, hence the propex of value close to 1 should be expected.
DE	E37-39 – Waste	0.32	All other MS = 0	☒	Certain waste collection activities are out-of-scope of VAT.
IE		0.50		☒	No source confirms that waste-related activities are out-of-scope or VAT-exempt.
EL		0.00		☒	Some sources suggest that certain waste-related activities are out-of-scope of VAT, which would result in a positive propex.
Various	F – Constructions and construction works	-	-	☒	Positive propexes in Spain (0.02) and Portugal (0.15) are justified based on certain exemptions (in Portugal) for buildings, and in Spain, in marginal cases concerning the value of the land. However, there are exemptions (full or partial) on the supply of new buildings also in MT, HR, DE, LU, SE. Depending on the characteristics of the local market, it may be real estate developers making the exempt supplies, hence the 0 propex for NACE F would still be justified.
DK	H - Transport	0.15	All other MS = 0	☒	Some transport services are VAT-exempt, which creates non-deductible VAT and justifies a positive propex.
IE		0.00		☒	Some transport services are VAT-exempt, which creates non-deductible VAT and would thus require a positive propex. The propex for passenger land transport was calculated as 0.41 in a recent study on the VAT on transport services for DG TAXUD (unpublished).
CY, LU, SK	H53 Postal services.	-	-	☒	The propexes differ significantly, which primarily reflects the different scope of the exception in various Member States (whether it applies to all postal services or only universal ones, i.e. basic postal services, only designated universal service

MS	Sector (NACE code and description)	Propex	Reason for outlier	Corrections or further verification	Comments
					providers, or to all operators, etc.). For instance, in Sweden, postal services are taxed at a standard rate in most cases, which justify a rate of 0. In addition, it depends on the services provided by the postal operators. For instance, in Italy the postal operator is also a telecommunication supplier, whose transactions are subject to VAT. We suggest verifying or double checking the following countries, where the very low propex is seemingly not justified by the secondary sources on VAT rates on postal services: SK (0.00), LU (0.03); and CY (0.15)
CY, CZ, HR, IE, PL	I Accommodation and food services	0.01-0.09	All other MS = 0	☒	A small but positive propex can be justified because the sector includes short-stay accommodation (NACE I55), which is exempt in some countries, and because of the use of reduced or super-reduced rates (despite the sectors being labour intensive, hence with input VAT typically lower than reduced output VAT).
CZ, HR, NL, PL, SE	J59-60 Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services	0.22 – 0.88	All other MS = 0	☒	There seems to be no justification related to the exemption of those services. One reason could be the taxation of public broadcasters, which in some countries are taxed at super-reduced rates (e.g. FR, IT), but this does not explain the outlying Member States. Another reason could be linked to the place of supply of television and broadcasting services, so that a Polish company supplying TV services to a consumer in another country would pay tax in the destination country while accumulating input tax in Poland.
Various	K64 and K66, financial services (including auxiliary)	-	-	☒	Propex for financial and banking services should be at or close to 1. However, there are various reasons that can determine a lower propex, including (i) option to tax; (ii) exports, especially for international financial centres; (iii) presence and specific features of the pension system (e.g. defined-benefit funds); (iv) relative importance of value chain activities vs. final providers. The following countries are worth a check: BG, HR (propex 1, but small-scope option to tax in place); CY, LU (propex at or near 1, but major financial centre); EL, IT (very low propex, no option to tax, no international financial centre).
MT	K65 – insurance	0.41	All other Member State >0.9	☒	Propex for insurance (no option to tax, limited taxable activities in the value chain) is expected at 1 or near 1. MT is the only country where this is significantly lower. This could be explained by a very high rate of exports in the insurance sector, but needs to be re-checked with the administration of MT.
IT, NL	M72 – Research and development	0.00; 0.04	Minimum among other MS: 0.40	☒	There is no exemption for scientific research, although it is reasonable to assume that when provided by not-for-profit bodies some activities are out of scope of

MS	Sector (NACE code and description)	Propex	Reason for outlier	Corrections or further verification	Comments
					VAT. However, the very low propex in these countries would need to be verified, unless the value added of these sectors in these countries is very limited. If no further information can be retrieved, replacing the current value with the EU average propex could be considered.
Various	N79 – Travel agents and tour operators	-	-	☐	Although the operators under the TOMS regime, which account for 30-50% of the margins of travel agents and tour operators, cannot deduct VAT on intermediated services, these services are not treated as their intermediate use, which justifies 0 propex.
None	O84 – Public administrations	-	All MS > 0.9	☒	This NACE group includes activities by public administrations across various domains. Public administrations are not considered as taxable persons (ex Art. 12 of the VAT Directive), but their transactions can be subject to VAT (i) if there is a risk of distortion of competition; (ii) for all activities listed in Annex I. This means that (i) a propex lower than 1 is possible; (ii) propex is expected to be close to one. This is the case in all MS.
AT, HU, IT, LT, LU, MT, SE, SI	P85 – Education services	-	Most MS ≥ 0.8	☒	Most of the activities in this NACE group are exempted (ex. Art. 132 of the VAT Directive). However, there are some business units whose transactions are typically subject to VAT (e.g. driving schools), as well as specific services (e.g. training), which are taxable. This is compounded by the national structure of the services. In this respect, we expect a lower propex in countries in which this sector is small because educational services are predominantly provided by public organisations (due to the relatively higher weight of taxable services). In contrast, we expect a higher propex in countries with a significant presence of private educational suppliers. Propex lower than 0.8 only for countries in which the size of the sector (as a % of GDP or IC) is above average should be verified.
HR, LU, MT	Q86 – Human health services	0.35; 0.21; 0.20	Most other MS ≥ 0.8	☒	Most of the activities carried out in this sector are VAT-exempt, with limited exceptions (e.g. cosmetic medicine). As a personal service sector, we do not expect higher deduction because of cross-border supplies, though this could happen in smaller states.
ES, IT	Q87-88 – Social work services	0.38; 0.45	All other MS ≥ 0.8	☒	Most of the activities carried out by this sector are VAT-exempt. However, compared to NACE Q86, there are more taxable activities, and additional conditions imposed by Art. 132 on the nature of the supplier (which in some cases must be a public or recognised body to benefit from the exemption). Hence, we expect a significant propex, though lower than for NACE Q86. Spain and Italy are the only MSs with propexes <0.5, but the values are still close to this threshold.

MS	Sector (NACE code and description)	Propex	Reason for outlier	Corrections or further verification	Comments
RO, LU	R90-92 – Creative arts, cultural services, gambling; R93 – Sport, amusement and recreation	0	All other MS > 0	☐	These sectors include a variety of activities, some of which are taxable, some of which mandatorily exempt (e.g. gambling), some of which can be exempt based on Art. 132 and 135 of the VAT Directive (e.g. sporting services supplied by non-public bodies), or that can be exempt based on standstill clauses (Art. 371 and Annex X of the VAT Directive). Depending on national choices, various propexes are possible. The polar values (0 and 1) should be verified.
ES, EL, HR	S94 – Membership organisation	0	All other MS > 0	☒	The provision of services by membership organisations is VAT exempt ex art. 132; the Court of Justice of the European Union (CJEU) explained that the term “trade union” should be interpreted as also including federations of employers or other organised interests. This sector presents the highest variance of propex among MS, signalling different national rules. However, propex of 0, i.e. no VAT exemption, seems hardly justifiable. Preliminarily, it should be verified whether the sector has a non-negligible dimension in these countries.
None	S96 – Services of households as employers	-	-	☐	Out of scope of VAT.
None	U – Extraterritorial organisations and bodies	-	-	☐	Out of scope of VAT.

Source: own elaboration.

Differentiation of weighted average VAT rates for household and intermediate consumption

Background

Household and intermediate consumption differs significantly in both nature and structure. When comparing household final consumption and intermediate consumption across different sectors of economic activity, not only is the distribution of expenses across main groups of products and services different, but consumption of specific products and services within those groups can also be expected to vary markedly. For example, under CPA 49 (Land transport services), households mostly purchase passenger transport services, whereas economic operators will primarily use freight as their intermediate inputs. Related to this, goods and services under one two-digit CPA code may attract different treatments, as in the case of land transport services. In other words, the effective rate on household and intermediate consumption (and across sectors) for the same category could vary because they make purchases with a different treatment. In other cases, the variance of the effective rate may be indirect, resulting from the difference between the purchased categories of products and services. This difference may also have a direct nature and result from the different treatment of certain business-to-business (B2B) and business-to-consumer (B2C) transactions.

In certain situations, if the difference in such effective rates is not accommodated, the accuracy of estimates may be affected. This results from data limitations and the fact that much less information is available on the granular structure of expenses of companies compared to household expenditure. More specifically, problems arise for the categories where the effective rates on consumption of the main categories of goods and services vary between final consumers and exempt sectors. Such problems do not arise in sectors with full right to deduct, where VAT is "neutral" (i.e. deductible by downstream industries).

In this section, we explore the possibilities of refining the current approach. The starting point is the legal analysis and an examination of those instances where the difference in the effective rate results directly from the provisions rather than indirectly from different categories of purchased products and services.

Legal treatment

Reduced rates or VAT exemption can be applied on *a ratione personae basis*, in other words depending on whether the purchaser is a private consumer or a taxable person carrying out an economic activity. This is, for instance, the case for the supply of new buildings and building lands, which benefit from exemptions, reduced, or super-reduced rates in a number of Member States when the supply is to a private individual for residential purposes.[82] Such examples are not numerous, and these inputs do not represent a large share of inputs for most sectors.

The VAT Directives introduce schemes or options that can offset or generate hidden VAT. This is the case for the following provisions:

- Option to tax.

[82] *Additional conditions may apply, e.g. that the purchaser owns no real estate property ("first housing") and the building is not a luxurious dwelling, as in Italy; that the building is not larger than certain size thresholds, as in Greece and Hungary; or when the building is used by the owner as their principal dwelling (as in Luxembourg). Many countries have a lower rate or exemption for social housing.*

- Special schemes introduced for simplifications, such as the Tour Operators' Margin Scheme (TOMS) (See extended discussion in *Special schemes* subsection below).

Financial services

Legal treatment

The option to tax is available for the supply of financial services (not embracing insurance transactions), the letting of immovable property, and for the supply of existing buildings and land.[83] The rationale for these options is to eliminate the hidden VAT that would build up in the previous stage of the value chain, where the supply is exempt, and that would not be deductible by the business purchaser. As a result, B2B supplies are taxed at a positive and higher rate compared to B2C supplies.

Options can be exercised on a transaction-by-transaction basis, or for all supplies made by a taxable person. In the latter case, the suppliers should tax all B2C and B2B transactions. The former mode increases the difference in average rates, because the supplier will apply VAT on supplies to business clients that can deduct VAT, while not applying VAT to B2C and B2G supplies, as well as to those business clients that cannot deduct VAT. However, the latter mode will also create a certain difference in VAT rates, because the option will more likely be used by companies specialised in the B2B segment, or because suppliers will organise into separate entities, one for B2B supplies opting for tax, and the other for B2C supplies applying the exemption. Finally, the impact on average rates depends on whether suppliers take up such an option.

Table 103 below summarises the information for financial services, including the expected impact on rate differentials.

Table 103: Option to tax – financial services

MS	Scope of the option	Transaction-by-transaction?	Expected impact on accuracy of current estimates
BE	Narrow (payment services)	No	Minor
BG	Narrow (granting of credit in relation to taxed supplies)	No	Minor
DE	Wide (all/most financial services)	Yes	Minor
EE	Wide (all/most financial services)	No	Major
FR	Wide (all/most financial services)	Yes (as from 2022)	Minor
HR	Narrow (granting of credit in relation to taxed supplies)	No	Minor
LT	Wide (all/most financial services)	No	Major
AT	Narrow (payment services, granting of credit in relation to taxed supplies)	Yes	Minor
PL	Wide (all/most financial services, as of January 2022)	No	Major

Notes. Narrow option → minor impact; wide option, no transaction-by-transaction → medium impact; wide option, transaction-by-transaction: large impact. Source. the Review of the VAT rules for financial and insurance services, for DG TAXUD, (unpublished), updated based on own desk research.

Previous treatment in the VTTL model

In previous studies, for economies in which the financial and insurance services make a large contribution to GDP, the study team requested additional information to allow the estimation of tailor-

[83] *An optional scheme also exists for transactions in gold, whose scope is however too limited to matter for the VAT Gap model.*

made rates on intermediate use of financial services (rather than assuming that this rate would be the same as for household final consumption). Eventually, such information was made available for two Member States. For other Member States, we assumed that services provided to businesses attract the same effective rate as those provided to final consumers.

The inaccuracies of such a modelling approach could appear in situations where there is a wide option to tax and the option to tax cannot be applied on a transaction basis. Such treatment was expected to lead to taxability for financial services provided also for businesses with no right to deduct.[84] On the contrary, when the option to tax is on a transaction-by-transaction basis, exempting services provided to operators that cannot deduct input tax will minimise VAT liability in the value-added chain.

Amendments

To refine this approach further, we consulted authorities and requested additional information for the cases categorised as major (EE, LT, PL).

Rental of buildings

Legal treatment

As discussed overleaf, the option to tax may also apply for the rental of buildings and supply of existing buildings. Table 104 below summarises the information for the rental of buildings, which is a component of the intermediate consumption liability that is scrutinised in this section. In contrast, the supply of buildings is an element of GFCF, for which the exact information on taxable and non-taxable supplies has been provided in administrative data.

Table 104: Option to tax – rental of buildings and supply of existing buildings

MS	Rental of buildings – non-residential/commercial
BE	Option to tax
BG	Taxable (residential is exempt)
CZ	Option to tax
CY	Option to tax
DK	Option to tax
DE	Option to tax
EE	Option to tax
IE	Option to tax
EL	Option to tax
ES	Taxable (residential is exempt)
FR	Option to tax
HR	Taxable (residential is exempt)
IT	Option to tax
LV	Taxable (residential is exempt)
LT	Option to tax
LU	Option to tax
HU	Option to tax
MT	Taxable (residential is exempt)
NL	Option to tax

[84] *The assumption is that we properly account for option to tax on the propex side but not on the rates'-side.*

MS	Rental of buildings – non-residential/commercial
AT	Option to tax
PL	Taxable (residential is exempt)
PT	Option to tax
RO	Option to tax
SI	Option to tax
SK	Option to tax
FI	Option to tax
SE	Option to tax

Source: Annacondia, F., & Herrero Moreno, I. (2023), EU VAT Compass 2023/2024, IBFD; Cnossen (2010), Improving the VAT Treatment of Exempt Immovable Property in the EU, Oxford University Centre for Business Taxation, Working Paper 10/19.

When the option to tax is available, we expect that rental services of non-residential real estate provided to companies with the right to deduct will mostly be taxable, so that the VAT liability in the value-added chain is minimised. At the same time, if these services are provided to businesses without the right to deduct (e.g. offices rented to financial companies), then to minimise the VAT liability in the value-added chain the operators should not opt for VAT.

Previous treatment in the VTTL model

The weighted average rate on rental and real estate services purchased by businesses was, by default, set as the same as the rate paid by households for residential rentals and the services of real estate agencies. As most of these services are exempt, these rates are close to zero. However, for four Member States (Estonia, Croatia, Cyprus and Spain), based on the information provided earlier by the administrations, we applied adjusted treatment assuming a higher rate on the intermediate consumption of CPA 68B.

Amendments

Since the rental of non-commercial real estate is taxable, the effective rate on real estate services purchased by companies without the right to deduct in Bulgaria, Latvia, Malta and Poland is too low, and needs to be further consulted with tax authorities.

Transport services

Background

There is wide variation in the rates applicable to passenger transport. Domestic passenger transport is primarily subject to the standard rate or reduced rate (in the case of Ireland and Denmark, it is partially exempt without the right to deduct). At the same time, international passenger transport is most often subject to the zero rate.

The rate applicable to household final consumption of passenger transport services could be estimated relatively easily thanks to the availability of household budget survey data. However, there is significant uncertainty around the rates applicable to transport services due to the lack of information on modal split and the split between international and domestic transport.

As discussed earlier, this does not cause any inaccuracies in estimating the VAT liability in value-added chains where VAT is deductible. However, inaccuracies may arise for exempt sectors without the right to deduct, which contribute to about 10% of the value of the entire intermediate consumption of transport services.

Previous treatment in the VTTL model

We assume that services consumed by exempt sectors are predominantly passenger transport services. This justifies using the weighted rates applied, as estimated for household final consumption.

Amendments

We further differentiated the rates on intermediate consumption of transport services of different sectors of economic activity. For the following sectors we propose using the rate as applicable for freight transport:

H53 – Postal and courier activities;

L68A – Imputed rents of owner-occupied dwellings;

L68B – Real estate activities excluding imputed rents.

This refinement was expected to have a minor impact on the VTTL as these sectors contribute only to 1.2% of intermediate consumption of transport services.

Tour Operators' Margin Scheme

Legal treatment

The VAT Directive introduces a number of special schemes for the purpose of simplification. Under these schemes, the operators have no right to deduct input VAT is expunged, which is a simplification in terms of place of supply and VAT registrations. This is the case, for instance, with the Tour Operators' Margin Scheme (TOMS) (Art. 306 and ff. of the VAT Directive) and of the margin scheme for second-hand goods (Art. 311 and ff. of the VAT Directive). The focus here is on TOMS, because of its economic relevance for intermediate consumption; a recent study estimated that it covers supplies worth about EUR 150 billion, of which two-thirds are B2C and one third is B2B.[85]

TOMS covers the supplies of composite travel services (e.g. accommodation and transport), but can also apply to the supply of single services in certain countries. The transactions covered by TOMS are subject to VAT on the margin; the travel agent and tour operator cannot deduct VAT on its inputs, and the VAT on the travel services cannot be deducted by the purchaser (with very limited exceptions in few countries). The application of TOMS is mandatory when the supplier is acting as a principal, but does not apply when the supplier is acting as an agent, i.e. as a mere intermediary between the underlying supplier of tourism services (e.g. airline or hotel) and the customer.

When supplies are subject to TOMS, hidden VAT accrues, which is a net cost for business customers. Hence, in B2B transactions, travel agents will strive to act as intermediaries rather than principals, thereby applying the standard VAT rate.[86] This means that B2C customers will face a significantly lower VAT rate compared to business customers.

Previous treatment in the VTTL model

Firstly, the weighted average rate on the services provided by travel agents and tour operators was estimated on the basis of information provided in the ORS, varying markedly across Member States.

[85] *Study on VAT Rules Applicable to the Travel and Tourism Sector, for DG TAXUD, 2022, on file with the author.*

[86] *Many tourism services are subject to reduced rate (e.g. restaurant, accommodation), exemption or zero-rating (e.g. international transport).*

Secondly, the rate applicable to intermediate consumption was set as for households. Finally, due to the lack of more detailed information, it was assumed that business expenses on these services could be fully deducted.

Amendments

Despite some uncertainty behind the numbers provided by the administrations, the national accounts data may not allow for more accurate calculation of the effective rate on CPA N79 services. However, the structure of intermediate consumption liability of the NACE N79 sector and the estimated non-deductibility rates for the core services provided or intermediated by the sector (see Table 99) allow for estimation of the non-deductibility ratio for CPA N79 services.

The weighted average non-deductibility ratios calculated by taking the proportion of intermediate inputs of accommodation and restaurant services, transport, entertainment and component non-deductibility rates are shown in Table 105.

Table 105: Calculated non-deductibility rates for CPA N79 – Travel agency, tour operator reservation service and related activities

	Passenger transport	Restaurant and hotel services	Entertainment	Weighted average
BE	0%	80%	100%	**78%**
BG	10%	0%	100%	**11%**
CZ	20%	20%	20%	**20%**
CY	0%	20%	20%	**18%**
DK	0%	51%	75%	**40%**
DE	20%	5%	0%	**11%**
EE	0%	64%	100%	**61%**
IE	0%	100%	100%	**90%**
EL	100%	100%	100%	**100%**
ES	20%	79%	0%	**71%**
FR	100%	52%	0%	**54%**
HR	50%	35%	50%	**37%**
IT	100%	0%	0%	**9%**
LV	0%	0%	0%	**0%**
LT	10%	79%	50%	**47%**
LU	0%	17%	100%	**0%**
HU	10%	76%	100%	**67%**
MT	50%	44%	100%	**0%**
NL	0%	72%	0%	**44%**
AT	0%	26%	100%	**26%**
PL	0%	100%	100%	**40%**
PT	100%	100%	100%	**100%**
RO	0%	0%	0%	**0%**
SI	0%	100%	100%	**91%**

	Passenger transport	Restaurant and hotel services	Entertainment	Weighted average
SK	0%	0%	0%	**0%**
FI	0%	0%	0%	**0%**
SE	0%	35%	100%	**35%**

Source: own elaboration.

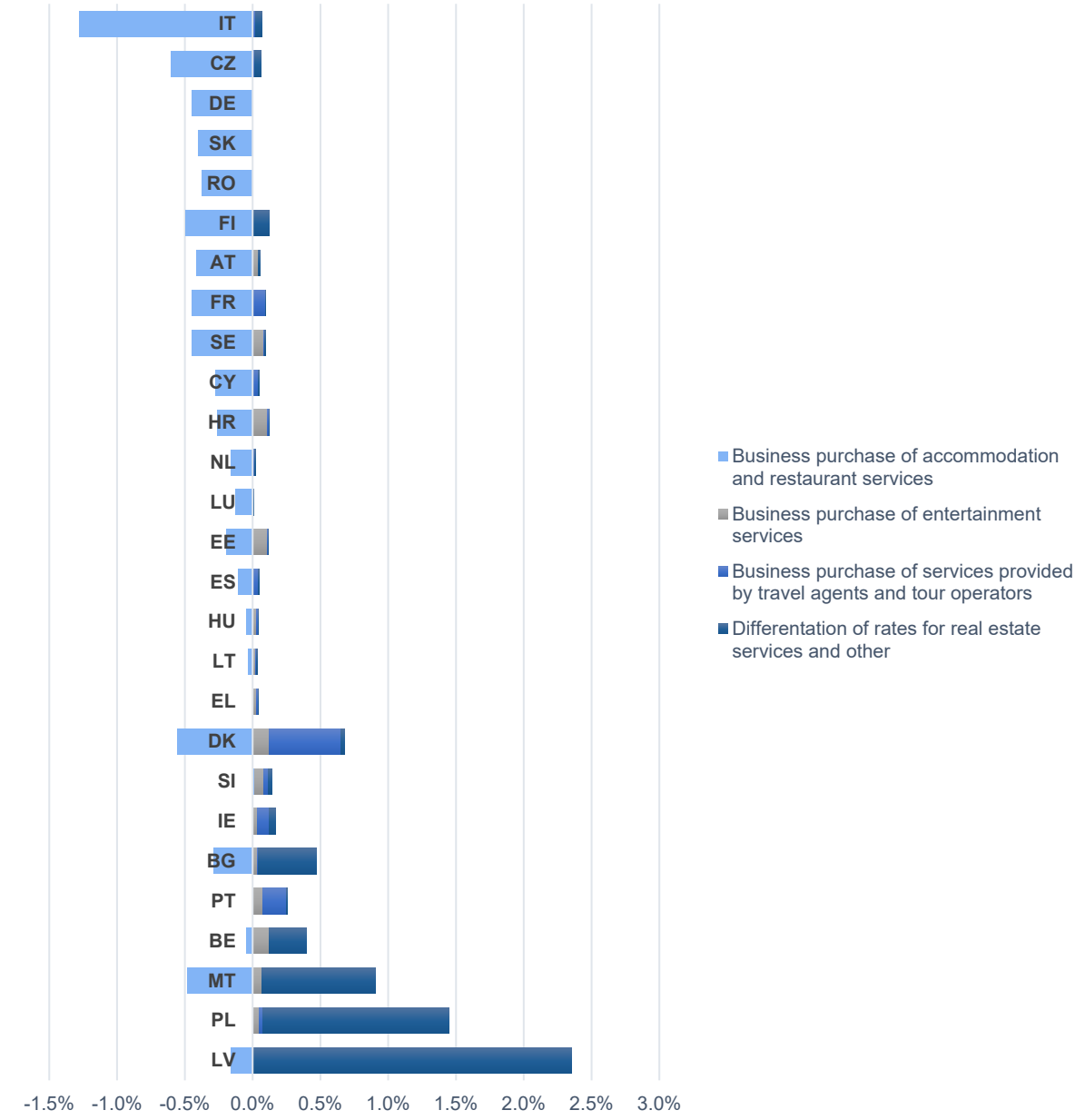
Impact of refinements on the VAT compliance gap estimates

The average absolute impact of all methodological changes to model parameters discussed in this annex across countries and years was 0.4 pp. At the same time, the average absolute change of the VAT compliance gap was 0.01 pp, which confirms that negative and positive revisions were nearly balanced.

In 77% of cases, the absolute impact of changes was below 0.5 pp., but there were also some cases of larger shifts. In the case of three Member States, the absolute revisions were larger than 1 pp. (on average between 2018 and 2022). For Latvia and Poland, the VAT compliance gap was revised upwards by 2.2 pp. and 1.4 pp on average, respectively, resulting from the adjustment of the rate applicable to rentals of commercial real estate. For Italy, the VAT compliance gap was revised downwards by 1.1 pp. on average, resulting mostly from the revised treatment of business expenses on hospitality and entertainment.

Overall, the revision of the approach to the business purchase of accommodation, entertainment, restaurants, and services provided by travel agents and tour operators had a negative impact on the VTTL estimates in most EU Member States (20 out of 27), with an average effect of -0.2 pp. Other revisions, including the adjustment of the rate applicable to rentals of commercial real estate, affected only a few Member States. The impact of these changes exceeded 0.1 pp. in just six countries. However, the effect of these changes on the estimates for those countries was much larger than the impact of changes related to the business purchase of accommodation, entertainment, restaurants, and services of travel agents and tour operators. In all cases, this effect was positive (see Figure 119).

Figure 119: Impact of revisions to model parameters on the VAT compliance gap (pp., 2018–2022 average)



Source: own elaboration.

Assessment of household final consumption liability modelling

As discussed in more detail in the Inception Report, one of the sources of potential inaccuracies in modelling the VTTL pertains to household final consumption and the fact that different data sources presented in different classifications are used to forecast household consumption structure for the two most recent vintages covered (in the case of the 2024 study this means 2021 and 2022). More specifically, to align different classifications, we use a so-called “ad-hoc” broad matching of COICOP 2-digit codes to CPA codes.

During the final stage of the work, the study team re-assessed the authors' correspondence of the relevant COICOP and CPA categories to minimize inaccuracies related to imperfect matching.

At the previous stages, we have also assessed alternative approaches: a simplistic method of using a single growth coefficient, ad hoc matching and another alternative option, referred to as the Cazcarro method.[87] Instead of relying on ad-hoc matching, it may be possible to match COICOP to CPA using the so-called contingency tables, which provide the exact matching formula between COICOP and CPA. Contingency tables are in general specific to Member State and year. They are developed by National Statistical Institutes (NSIs) and are sometimes publicly available. Contingency tables for a particular Member State and year are also occasionally estimated by researchers and published in peer reviewed journals.

In response to the comments from the Commission received at an earlier stage, we improved and extended the earlier assessment. As was pointed out by the reviewers, the published tables are likely to be outdated, since they were calculated for 2010. We have therefore updated the contingency tables to match the CPA and COICOP totals (across columns and rows) in 2019, using RAS method (also known as iterative proportional fitting).[88]

Table 106 shows the comparison of forecasting 2020 data based on 2019 data across five different approaches. Specifically, it compares the relative error between household final consumption liability calculated using actual figures published for 2020 in CPA classification, and household final consumption liability derived using various methods of triangulating 2019 data in CPA classification and 2020 data in COICOP classification. In addition to updated contingency tables from Cazcarro et al. (2010), we also present two distinct approaches to ad-hoc matching.

Table 106: Relative error in household liability: actual vs forecasted values, +/- pp.

	Method				
MS	**Single Growth (former)**	**Ad-hoc matching (current)**	**Ad-hoc matching (improved)**	**Method of Cazcarro et al (2010)**	**Method of Cazcarro et al, RASSed to 2019**
AT	0.45	0.47	0.44	0.83	0.58
BE	1.70	0.24	0.81	0.36	0.58
CY	0.93	0.64	0.34	0.90	0.38
CZ	1.69	0.58	0.06	0.18	0.10
DE	0.03	1.75	0.00	2.14	0.32
EE	0.44	0.60	0.02	0.02	0.00
ES	4.75	1.33	0.14	1.00	0.55
FI	0.94	0.45	0.32	0.48	0.08
FR	3.06	0.19	0.72	0.97	0.54
EL	1.43	2.39	0.51	1.00	0.73
HR	1.99	1.12	0.27	3.58	0.45
HU	0.10	0.24	0.25	1.14	0.11
IT	3.44	0.82	0.07	0.28	0.18
LT	0.16	0.91	0.48	0.06	1.08

[87] *Cazcarro I., Amores A. F., Arto I., Kratena K., Linking multisectoral economic models and consumption surveys for the European Union, Economic Systems Research, 2016, https://doi.org/10.1080/09535314.2020.1856044.*

[88] *Implemented by STATA command mstdize (by Nicholas J. Cox, Durham University)).*

	Method				
MS	**Single Growth (former)**	**Ad-hoc matching (current)**	**Ad-hoc matching (improved)**	**Method of Cazcarro et al (2010)**	**Method of Cazcarro et al, RASSed to 2019**
LV	0.79	1.29	0.75	0.79	0.51
LU	5.75	2.88	0.46	0.54	0.47
NL	0.55	2.00	0.51	0.35	0.31
PL	0.65	0.50	0.64	0.80	3.17
PT	2.54	0.59	0.11	0.36	0.05
RO	3.73	1.96	0.53	1.59	0.63
SE	1.13	1.89	0.33	0.24	0.34
SI	1.24	1.08	1.63	1.95	1.13
SK	0.12	0.49	0.32	2.66	2.08
Average error	**1.64**	**1.06**	**0.42**	**0.97**	**0.62**
Median error	**1.13**	**0.82**	**0.34**	**0.80**	**0.47**
RMSRE	**2.29**	**1.32**	**0.56**	**1.33**	**0.96**
CV (coefficient of variation)	**0.93**	**0.69**	**0.82**	**0.90**	**1.12**

Note: BG, DK, MT are not included, since 2020 SUT data are not yet available; IE is not included, since we are using NSI based data for IE with different CPA codes;

Source: own elaboration.

The last rows of the table compare the relative errors of household final consumption liability across different approaches. As expected, the updated contingency tables led to an improvement in the precision of the Cazcarro et al. method, which turned out to be more accurate than the ad-hoc matching used to date. At the same time, the new correspondence used for the ad-hoc matching appeared to minimize the root mean squared error among all the options.

As discussed in the inception report, in some cases (if the background data allow), it may be possible to avoid forecasting error entirely by switching from CPA-based rates and CPA-based consumption values to COICOP-based rates and COICOP-based consumption values (available without much delay). So far, we have tested the switch to COICOP-based calculation for Greece and Croatia.

Table 107 shows the results for Greece and Croatia. Column (A) presents the liability calculated by the current method, using CPA-based rates, derived from the ORS submission for 2020 with the consumption structure as of 2018 (ORS uses T-2 data). Column (B) shows the liability when COICOP 3-digit rates are calculated using the same ORS-2020 submission. The rows show the liability calculated for different years. Importantly, in column (A) the 2020 results are based on published SUT data, whereas 2021 and 2022 use forecasted SUT data (as explained above). In contrast, the estimates presented in columns (B) and (C) use COICOP-based consumption data without the need to match different classifications.

Intuitively, if the rates are calculated correctly, we would expect the liability in column (B) to be close to (A) for 2020 (when using the actual data) and show some divergence in 2021 and 2022 due to the forecasting error increasing over time. Surprisingly, we see the opposite: liability (B) in 2020 is 2% lower than liability (A). Since the net base data are the same, this means that the COICOP effective rate is somewhat smaller than the CPA-based rate, reflecting a positive bias in CPA-based rates due to imperfections in CPA-COICOP product matching. Assuming the same constant bias holds in 2021 and

2022, liability (B) should be 2% lower than (A). Yet it is almost equal, implying a negative bias in 2021 and 2022 due to SUT forecasting error, which cancels out the positive bias. In other words, the CPA-based calculation predicts a higher average rate, but a lower growth rate.

Column (C) shows the liability when COICOP 3-digit rates from the ORS-2020 submission were updated using the HBS-2020 COICOP 4-digit consumption structure. For all the years, there is a consistent 3-4 percentage point difference between (C) and (B). The net base is the same, and the difference is solely in the consumption structure: 2018 base data in (B) and 2020 base data in (C). This is quite a significant difference, which advocates using the HBS-2020 structure for 2020 (a COVID year). However, as discussed in the inception report, it seems inappropriate to use the HBS-2020 structure for the non-COVID years 2021 and 2022.

Table 107 also contains a simulation for Croatia, however column (C) – rates updated with the HBS-2020 structure – is not available since the background data was not available at the COICOP 4-digit level. The pattern for Croatia seems to be very similar to that observed for Greece.

In 2020, when using published data in both methods, the COICOP-based liability is smaller, implying a 3% lower effective COICOP rate or a positive bias in CPA rates. The difference then diminishes in 2021 and 2022, implying that the CPA-based forecast is negatively biased, which cancels out the positive CPA rate bias.

In summary, our analysis for Greece and Croatia shows the potential for improvement in accuracy when switching from CPA to COICOP-based rates calculation. The effect is stronger in 2020, which uses the published data. However, when using forecasted T+1 and T+2 data, the effect of the switch largely cancels out. At this stage it could be concluded that the effects of switching to COICOP-based rates calculation are modest and do not call for immediate revision of the approach, especially for the calculation covering periods when the consumption structure is relatively stable. The gains of tailoring the approach for selected Member States must be evaluated against the costs and risks involved in decreasing the level of harmonisation.[89] At the same time, we suggest that the future studies expand the analysis to cover other Member States for which COICOP-based calculation is possible (Cyprus, Estonia, Austria, the Netherlands, Portugal and Germany) and monitor the pros and cons related to the change in the modelling approach.

[89] *As for instance the increase in the workload and risks of revising the approach if the data format shared by national administrations changes.*

Table 107: Comparison of household final consumption liability using alternative approach (EL and HR, EUR million)

		Baseline (A)	(B)	(C)
Structure of consumption:		ORS 2020	ORS 2020	HBS 2020
Assignment of rates:		CPA	COICOP	COICOP
Net base:		SUT (CPA)	COICOP	COICOP
EL	2020	12 570	*12 327* (-2%)	12 702 (+1%)
EL	2021	14 056	14 067 (+0%)	14 558 (+3%)
EL	2022	16 790	*16 753* (-0%)	17 451 (+4%)
HR	2020	4 652	*4 523* (-3%)	-
HR	2021	5 894	*5 781* (-2%)	-
HR	2022	7 163	*7 156* (-0%)	-

Source: own elaboration.

Annex D. Reviews and responses to reviews

Review of the Inception Report by Stefano Pisani

COMMENT	RESPONSE
Stefano Pisani	
p. 7-8 "Starting with the 2023 study, provoked by the changes in consumption structure due to the COVID-19 pandemic, the approach was refined by using observed changes in the COICOP based structure as published by Eurostat. *Comment* This is more of a question than an observation. Does the method you used to extrapolate household consumption require a rescaling of forecasts to the more aggregate figure in the national account? Although you do not have SUTs for the most recent years, you are aware of the household consumption figures published yearly by the national account offices. Are your forecasts consistent with these figures? I suggest providing the same consistency test for the Cazcarro method as well.	Household final consumption figures published by Eurostat in COICOP classification are the new reference figures for forecasting this components of tax base. At the end of the procedure, total household final consumption is matched to the latest national figures, as published by Eurostat (nama10_co3_p3). We do not check the figures individually with each NSI, but NSIs are supposed to transmit these data to Eurostat regularly, and data seems to be regularly updated by Eurostat.
p. 11 "Euro-HBS-based tables on household consumption structure published by Eurostat for 2020.[90] This set contains expenditure breakdown by 115 codes of 4-digit COICOP and available for 22 MS (but not for Portugal, which is in the problematic list).[91]	Please see our reply above.

[90] *HBS_EXP. https://ec.europa.eu/eurostat/databrowser/bookmark/df8bf062-39bb-40e7-8e89-77c8d0b070c0?lang=en*

[9191] *Of those 22 Member States, for three Member States the information is provided in less granular breakdown than 4-digit COICOP. For another three Member States, household consumption baskets were derived by correcting 2015 HBS results by price inflation. The Euro-HBS results for Portugal will likely be published during the project.*

COMMENT	RESPONSE
Stefano Pisani	
Euro HBS (2020) micro-data from ESTAT possibly on 5-digit or even more granular level. At the same small sample sizes in HBS in some Member States may be insufficient for accurate calculation of average rates for particular products. HBS micro data available from NSIs for 2021 and 2022 years (available for over 1/3 of Member States that conduct the survey annually). Administrative data from tax returns." *Comment* Again, to avoid the classification problem and typical underestimation problems of HBS tables, I suggest rescaling HBS data to National Account data.	
p. 16 "… tourism and hospitality sector as it was particularly affected by the pandemic and related containment measures. As the previous VAT gap study pointed out, decreases in VAT compliance gaps were more pronounced in Member states with a large contribution of these sectors to Gross Domestic Product (GDP)." *Comment* This conclusion is entirely reasonable, we can call it a composition effect, and we can explain it this way: if, *coeteris paribus*, the HC structure changes by reducing the 'weight' of the commodity characterized by a relatively low degree of VAT compliance, compared to other commodities, this reduces the total VAT gap. One could observe this effect by comparing the changes in the shares of tourism and hospitality and public utilities in total final consumption. I guess that the former decreased during the pandemic and the latter increased (both the effects are due to the restrictions introduced to contain the contagion). Since	Thank you for re-assurance. We well noted the comment and we concur with the proposed term of the "composition effect".

COMMENT	RESPONSE
Stefano Pisani	
tourism and hospitality have a lower level of VAT compliance than public utilities, this "composition effect" would have helped reduce the VAT gap.	
p. 17-18 "The second case study will cover the Member States with the largest decrease in the VAT compliance gap in recent years. Based on the 2023 study we assume these Member States will be Lithuania, Hungary, Poland, and Slovakia. … Descriptive statistics on the development of the VAT compliance gap will be updated (Figure 12, 2023 report). Furthermore, we intend to complement the descriptive analysis with qualitative expert interviews." *Comment* It might be useful to supplement the descriptive analysis with information about the change in the structure of actual VAT (if available), for example: the distribution among different VAT rates, the share of the refund in gross VAT, the growth rate of VAT by sector of economic activity.	Thank you for this comments, We will expand the descriptive analysis in the final version of the case study that will be presented in the Final Report.
p. 25 "… 2024 VAT gap study envisages different means for reviewing, assessing, and refining the methodological approach developed in the previous editions of the VAT gap study." *Comment* I suggest introducing a small improvement in the definition of VAT by distinguishing between gross and net VAT compliance gap. According to the IRS definition, the former is the difference between the actual	We will add relevant discussion in the final report. 2023 final report (as well as earlier vintages) contained the content describing what the net and the gross tax gap is and explained that the estimates that we derive are closer to the "net gap" definition..

COMMENT	RESPONSE
Stefano Pisani	
tax liability for a given tax year and the amount that is paid on time, and is composed of the underreporting gap, underreporting gap, and underpayment (or remittance) gap; the latter gap is the part of the gross tax gap that will never be recovered through enforcement or other late payments. This clarification is to specify that in the text we estimate the net VAT compliance gap. Thus, the dynamics of VAT recovered through law enforcement is a factor that influences the trend of the VAT gap.	
p. 35 "The visualisation of trends for the EU27 shows that the pandemic significantly disrupted trends observed for preceding years. ... Looking at tax base, in 2020 household final consumption and VAT revenue dropped by around 7%, while effective rate (mostly as a result of tax relief measures) dropped by around 2%. Already in 2021, all these components returned to the pre-pandemic levels but with different rates – the VAT revenue picked up the most (by around 16%, compared to 2020), almost returning it to the long-term trend. Household final consumption returned to the 2019 level, while effective rate increased only slightly. Since VAT revenue growth significantly outpaced the growth of VAT base (with relatively stable rates) that meant that the compliance had to be much higher. In 2022, VAT revenue and household consumption continued to grow at a fast pace – by 10.3% and 11.5% respectively. This could be a signal that in 2022, taxpayer compliance has further improved (assuming no substantial changes to the effective rates)." *Comment* Compliance trend analysis could be refined by adding the potential VAT base. Is it possible to derive this indicator from your model? The different trends between the potential VAT base and HCs are due to the dynamics of other VAT components other than final consumption (intermediate consumption and gross fixed capital formation) and the effect of tax legislation impacting the VAT HC base. Therefore, a comparison of actual and potential VAT provides a more accurate description of compliance trends.	Thank you. We agree that this is a interesting component that should be included in the report. The final report will contain a separate chapter discussing the revenue growth components. In this chapter, we will look at the impacts caused by changes in household final consumption structure.

COMMENT	RESPONSE
Stefano Pisani	
Restrictions introduced by countries to contain the COVID-19 contagion selectively impacted different sectors of economic activity, and this cause the composition effect mentioned above. To highlight this effect, it might be useful to analyze the composition of HCs by product in 2020, the year in which the most restrictive measures were adopted, and then compare it with the compositions in 2021 and 2022.	
P. 36 and table 10 Comment. The VAT gap estimates for the years 2021 and 2022 are influenced by several issues well mentioned in the text and mainly due to the pandemic. In addition to the countries mentioned in the inception report, other countries show anomalous trends in the years 2021-2022, such as: BE, CY, LV, NL, SI. These estimation problems are a major drawback for compliance analysis in more recent years, so I strongly suggest adopting some adjustments to provide more realistic results. As is correctly pointed out in the text, the anomalous trends are mainly due to either incorrect quantification of actual accrual VAT or calibration of policy parameters. I suggest that a statistical correction be applied for the years 2021-2022 that preserves the sign of the rate of change and smooths its magnitude.	Implementing a sort of smoothing the series has earlier been considered by the study team. After weighting pros and cons, we decided not to adjust the estimates in any other manner than direct adjustments to tax base or parameters. Directly. Such an operation would mean effectively getting rid of any unexpected changes – thus would hinder observing actual large scale shifts in the VAT compliance gap.

Review of the Interim Report by Sebastian James

COMMENT	RESPONSE
Sebatian James, Professor of Practice in the Sanford School of Public Policy, Duke	
Methodological Approach 1. The methods used to estimate the VAT Gap have been substantially honed over several years and the additional refinements proposed would go a long way in making it better. The report over the years has moved member countries to share data more freely to enable the better estimation of the compliance gap serving a useful tool for improvements in compliance policy in member countries through learning from success stories of successful efforts by other countries to this effect. Hence, in the interest of doing even better, it would be useful to consider for the future the measurement of VAT Compliance Gaps by sector. This would depend on the ability and willingness of Member countries to provide data of VAT Revenue by Sector as the VAT potential by Sector is available. This approach may be started for a few member countries as a pilot. In section V.b., it is mentioned that "propexes are mainly calculated using data provided by administrators every year". This means that sector level information is being provided by tax administrations. Could you please clarify if this is the case and if so, is it possible for them to share the sector wise VAT revenue collected? The sector wise approach would address several points raised in the interim report, such as the level of compliance in the tourism sector, the likely lower compliance in the service sector as a whole, the level of compliance in the e-commerce sector among others. Certain countries have started bottom up estimation of VAT Gap using audit data. This allows the estimation of the compliance gap at a more granular level. Member countries who have embarked on such studies may be encouraged to share their results. The report may provide such potential improvements in the estimation of the VAT Gap to lay the ground for the future. 2. It would be useful to provide the methodology of the VAT gap model in great detail (maybe in an appendix or a link to a detailed model). The 2023 report does this in section 1a. of the report but	1) Thank you for this comment and re-assuring words. We concur with the view that the production-side approach allowing to break the gap by the sector of economic activity would be a natural way to expand the study. Under the 2022 study we verified the availability of sectoral revenue data. Unfortunately, the group of Member States not in position to share these figures was too large to consider it as a baseline method at the time. As noted by the reviewer – the study team benefits from detailed administrative data for estimating model parameters (including sectoral propexes). This information has been shared by many MS due to the legal obligation to compile it for the sake of "Own Resource Submissions'. Anyhow, the estimates of propexes are not always based on administrative data and not all the Member States have sufficiently detailed reporting to gather this information. In consequence, we estimated that with the production-side

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some aspects may be further elaborated even if this may be familiar to some readers. For example, it would also be useful to explain the impact of exemptions and how this may change the potential VAT collectible in a certain sector. Further, more detail may be provided in how businesses who are unregistered are estimated as they are recorded in intermediate consumption in the Supply Use Table even though they may not be allowed to claim input tax credits. The report refers to "average rates" in many places, this methodological guide would explain how these average rates are computed. 3. In several parts of the report (for example in Section V.b. "Differentiation of weighted average VAT rates for household and intermediate consumption") where the phrases "economic operator", "company", "taxable person" are used interchangeably. If it is intended to address these differently, it may be clarified in the report. 4. Section V.a. Introduces several refinements into the model for the treatment of Accommodation, Food and Beverage service activities, entertainment and passenger transport. Meanwhile section V.b. refines several propex coefficients which would be affected by the refinements in Va. It would be useful to mention these interactions. 5. The treatment of transport services Section V.b. page 61 may need some clarification as it appears that the challenge relates to separating domestic passenger transport from international passenger transport. But from the discussion on the refinements is not clear what is being attempted. 6. In Section V.b., "Rental of buildings", Page 61, there is reference of non-commercial real estate, while Table 15 refers to non-residential . It is not clear if this is intentional. Again, in this section, Table 15 and the countries referred to in the text do not seem to match. 7. In Section V.b., "Special schemes", there is reference to the word "expunged". This is unclear and possibly a typo. In the same section, the fact mentioned in footnote 28 that "many touristic services benefit from a reduced rate" is important enough to be mentioned in the main text as this provides the main motivation for B2C customers to face a lower VAT and hence affect the motivation of travel agent suppliers to act as agents rather than a principal.	approach we would not be able to cover at least 10 MS. 2) The comment on expanding the methodological discussions is well noted. We will extend the discussion, including the impact of exemptions/right to deduct input VAT. 3) We noted well the problem with consistency of the wording used for "taxpayers". In the Final Reports, we will narrow down the number of terms used and add some additional explanation. 4) We expanded the description of the interlinkages between various components of the VTTL and added additional subsection discussion the magnitude of revisions. 5) Clarified. 6) Corrected. 7) Clarified. 8) Clarified. 9) That is an interesting example that we added.

COMMENT	RESPONSE
Sebatian James, Professor of Practice in the Sanford School of Public Policy, Duke	
8. In Section V.c., while for the experienced reader it is understood the household survey is one of the "different data sources" it would be helpful to mention that explicitly in the text. 9. In section V.d. on the actional policy gap on the treatment of financial services, there is a mention of China's VAT treatment of financial services. It may be also useful to mention that Sri Lanka also collects VAT from financial services using the "Profit-Plus Method", i.e., VAT Liability is calculated as Net-Profit before Income Tax *less* Economic Depreciation *plus* Book Depreciation *plus* Labor Costs. 10. In Section III there is a discussion on how inflation may have played a role in VAT receipts. It would be useful to explain the impact of inflation also on businesses having to register due to crossing of VAT threshold purely as a result of inflation and affecting the VTTL estimates.	10) Indeed, this is another driver that we have now mentioned.
Case Studies 1. The Case Studies discussed in the interim report are repeated from the previous report. It is not clear if this was intentional, and the purpose was to dig deeper into the factors that contributed to the success. As mentioned earlier in my comments on the methodological approach, it would be useful in the case studies to ask member states for sector wise revenue and compliance information. 2. In Section V.a. the case study on COVID-19 and the VAT gap, page 73 refers to the compliance improving in Spain, Greece, Austria and Malta when from the Figure 32 it only appears that it has improved only in Austria and barely in Greece. Please clarify. 3. Section VI.c. estimation of the impact of ecommerce and digital payments on VAT compliance gap is a useful effort.	1) Two of the three case studies are repeated from last year's report. This was intentional to a) follow-up on the developments observed such as the impact of lowering the effective rate in Germany considering the new estimates for 2022, and b) dig deeper into the underlying mechanisms. To achieve b) we perform several expert interviews, especially from the industry to get their on-the-ground opinion on the developments observed and hypotheses stated. We agree that it would be useful to know sector wise revenue and compliance. However, for our case studies, experts from the industry

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	(associations) in selected Member States are interviewed. They are best suited to answer our qualitative questions outlined above. 2) Concerning Spain there was a mistake in the figure (same compliance improvement in between 2019/2020 and 2020/2021). We have corrected that. Between 2019 and 2020 the VAT compliance gap in Spain improved by 2.4 pp from 7.9% to 5.5% which we think is notable. Concerning Malta, the gap improved from 29.3 to 27.5 which is less significant but nevertheless constitutes an improvement.
Refinements The refinements in the methodology are very useful and would go a big way to make the estimates better. Regarding the quantification of qualitative limits of non-deductibility (Table 9) one suggestion would be to provide some background on how the quantification has been done by showing some examples of law and their categorization into negligible, minor, moderate, or major.	Thank you for this comment. We added a separate section devoted to the magnitude of revisions.
Policy Gap 1. It would be useful to clarify if there are any exemptions in supplies that are B-B that could potentially generate a negative policy gap. 2. Policy Gap breakdown into its various components shown in figure 23 in the 2023 report may be replicated for the current report as it provides useful information to the reader.	1) Indeed. The Final Report will contain the estimates of the exemption gap and their components. For Member States, where specific exempt services are provided mostly in B2B transactions, the gaps are

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	negative, which we will explain discussing the underlying drivers. 2) Thank you. We will replicate these components. After some additional discussions with the Commission, we will also add the additional element of the 'transport services gap'.
VAT Compliance Gap 2022 vs 2021 (Chapter IV) Table 7 shows the compliance gap changes between 2022 and 2021. It would be useful to sort this table by the gap change to allow the reader to better understand easily which countries have done better and which have done worse. Further it would be helpful to understand what factors may have led to these changes in these countries. For example, what may be the reasons for the drop in the gap for Cyprus by 8.7 pps and the rise in the gap for Slovenia by 5.9 pps? (please correct the text in page 39 which refers to the range as "-8.7pp to 5.6pp")	The Final Report and individual country pages will seek to explain these changes in addition to case studies looking at some specific drivers on non-compliance. Thank you for spotting the error, which has already been corrected.
Dissemination of the Results The creation of an interactive website would greatly help to make the report accessible to a wider audience. This also allows the provision of detailed methodology and additional materials to those who want to go into the finer details. This is an excellent effort.	Thank you for re-assurance. We are on a right track to set such website.
General Comments 1. The definition of propexes may be provided before it is first referred to in the text Section 1 Bullet 2 rather than in bullet 4. 2. The section on the possible impact of COVID on VAT collection as well as the VAT gap is excellent.	1) Corrected. 2) Thank you! 3) We concur and will adjust the order in the Final Report.

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Sebatian James, Professor of Practice in the Sanford School of Public Policy, Duke	
3. Section VII, the individual country report may provide the VAT information right at the beginning as I believe that is the main focus of the report. The macroeconomic drivers may follow later.	

Review of the Draft Final Report by Stefano Pisani

COMMENT	RESPONSE
Stefano Pisani	
The 2023 report on the VAT gap in Europe is clear, well-structured, and covers all the major aspects with respect to VAT gap estimation and analysis. The authors were faced with two challenging issues, on the one hand the turbulence in the time series induced by the pandemic shock and on the other hand the loss of information due to the absence of the “Own Resources” database, which was a very important source of information on tax rules and tax base structure in past editions. Both topics were comprehensively covered, providing in-depth analyses and detailed methodological notes. The report provides a exhaustive picture of the VAT gap, considering both the compliance gap and the policy gap, and this approach is very informative for better understanding trends in actual VAT revenue. It is worth noting the novelty introduced in this edition regarding the breakdown of the rate gap by products, which is very important to better understand the impact of changes in national legislation on annual changes in actual VAT. Regarding the policy gap analysis, I propose a terminology revision of not using the term “ideal notional revenue” when it comes to total VAT revenue, because there is no consensus to consider a VAT system without exemptions and reduced rates as ideal. Terms such as "theoretical notional revenue”, "standard notional revenue” or something similar could be more adequate. From a 'policy' perspective, the detailed policy gap analyses provided by the report could be very useful for the EU Commission to better quantify the impact of different VAT legislation among member states on revenue and to improve the process of VAT harmonization across the EU. A great effort was also produced to investigate the factors influencing the VAT compliance gap to deepen the turbulence of the estimates in the 2021-2023 period. The results illustrated, although they do not lead to definitive conclusions, provide valuable information to understand more about the phenomenon and supply useful empirical evidence to further develop the theoretical analysis on the topic. In addition, the analyses stressed the need to examine more detailed macroeconomic data to better understand the cause of the VAT gap, which may be hidden if only trends in household consumption or GDP in total are considered.	Thank you very much for your thorough review. In communication with the Commission it was decided the the term of the notional ideal revenue will be carefully analysed and revised in the next year’s study. Following the comment made, the study team included additional explanation and caveats regarding unavailability of the stock of VAT credits for certain periods and Member States.

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Conducting interviews with experts to investigate the factors that influence the VAT gap is noteworthy not only for the opinion it gathers, but also as a measure to further bridge the cultural gap between gap analysis and the people that address these issues in practice. It is a good practice to align gap analysis with real problems related to noncompliance, and this could provide some useful insights to the Revenue Administration as well. From a general point of view there is a common consensus among experts related to the positive impact of digitization, both of revenue administration and the supply of goods and services, on VAT compliance. The experts also pointed out that for digitization to have a positive effect, it must be characterized by high-quality digital solutions, adequate infrastructure endowments and adequate know-how of the tax administration. This implies that public administrations must adjust their organizational processes and direct their search for human resources toward professionals who are able to meet these requirements demanded by digital solutions. These aspects could suggest important practical actions that could be implemented by the European Commission. The revised version of the estimates for the years 2020, 2021 depicts a more realistic development of the EU VAT gap, in particular the upward revision in 2021 is the result of a better calibration of the policy parameter, which greatly affected the pandemic and post-pandemic period. Some minor problems remain, highlighted by some negative VAT gaps in 2022, which are patently unrealistic and should be better analyzed in the future. The methodology for assessing the credibility of VAT compliance estimates, outlined in Appendix B, will help this fine-tuning process and is a best practice in the dissemination of this type of estimate. The lack of information on VAT credits carried forward to the next period to offset future credits should be mentioned in Chapter VII, and hopefully also in the introduction, as an unresolved issue in the VAT gap methodology. This major drawback is not new but has persisted since the inception of CASE estimation and is due to the rules for calculating actual VAT established by the ESA regulation. Disregarding the carryover of VAT credits alters VAT gap estimates in short-term fluctuations, and this error could be very important in the presence of a major shock such as the COVI-19 pandemic. In fact, the sharp drop in sales in some sectors and the subsequent bouncing back, due to restrictions introduced to counter the spread of the contagion, could also have caused an abnormal trend in the time series of the stock of VAT credits (in Italy this	

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stock decreased by -674 million in 2020 and increased by more than 4 billion in 2021) and consequently bias the rate of change of the VAT gap.	
Chapter 1. Economic context Chapter 1 provides information on key EU macroeconomic indicators and the impact these indicators have had on VAT revenue (first section) and VAT compliance (second section). **In Figure 1** in Section I.a., total EU VAT revenue is correctly compared with household consumption and EU GDP both expressed in nominal terms, but in the following text real GDP growth is cited as a proxy for the performance of the overall tax base. This statement is incorrect, because the correct proxy for the rate of change in the overall tax base is the rate of change in GDP in nominal terms, and it seems to contradict Figure 1. From a general point of view, real GDP growth can be taken as a proxy for total revenue growth when a causal analysis is conducted, but Section I.a. shows only a descriptive analysis, in which case only nominal trends in macroeconomic indicators should be taken as a proxy for revenue growth. In fact, correctly, in the remainder of the section the description of trends in macroeconomic indicators in real terms is associated with the description of inflation trends. The same confusion also affects **Table 1**, where it is not clear whether it refers to the deterministic impact of macroeconomic indicators on VAT or the causal impact. If it is intended to emphasize the deterministic effect, it should change the column heading to impact on potential VAT and change all comments in the rows accordingly. Also, when referring to the real variables (GDP and household consumption), it could change the comment to "Strongly correlated with growth in the potential VAT base in the absence of significant price changes." Finally, I suggest differentiating the correlation with GDP and household consumption, as the latter (I believe) is stronger than the former. If you mean to emphasize the impact of causality, the table is a bit confusing because there is a strong correlation between the mentioned variables. I suggest devoting Section	We have taken this comment on board and adjusted the world GDP growth rate to be based on nominal GDP rather than real. With regards to the write-up section on the EU that covers GDP we will continue to cover both nominal and real GDP but highlighted that nominal GDP is a proxy. These adjustments have been made to table 1.

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I.a to explaining the macro variable on potential VAT and moving the correlation analysis to Section I.b, which is specifically focused on VAT compliance trends.	
It might be useful to mention at the beginning of **section I.b**. that the sharp decrease in the 2020 VAT gap was driven by the dynamics of 10 countries that experienced a decrease in the VAT gap of more than 38 percent in a single year (Belgium, Bulgaria, Czech Republic, Estonia, Ireland, Italy, Cyprus, Luxembourg, Austria and Poland, see Chapter V.).	This has been added as a footnote.
In the same section, the following factors affecting the VAT gap are mentioned, among others: household final consumption by category, sectoral growth patterns in an economy, and the tourism sector. Basically, these are not three different factors, because the first two are the two sides of the same coin (from the production and demand approach) and the third is a component of the sectoral growth path. All these components can be cited as structural changes in consumption behavior that can be analyzed from both the demand side (household consumption) and the supply side (sectoral growth patterns in an economy and, in particular, in the tourism sector).	We have adjusted the bullets to account for this comment.
Figure 14 does not seem to support the previous statement ("there was an increase in online sales orders during the pandemic in the EU27, with online sales increasing to 19.8 percent of all orders, from 18.1 percent in 2019 (Figure 14)), because the share of online sales seems constant over the period, I suggest better clarifying or changing the format of the graph in Figure 14 (e.g., rate of change?)'.	We have removed this chart as it was causing confusion.
I suggest moving the section on **"Economic Developments and Compliance in Different Countries"** to the beginning of the paragraph, because the unclear relationship between nominal growth in total household final consumption and the VAT compliance gap (figure 15) is the reason for the more detailed analyses outlined in the paragraph.	After some more elaboration we decided not to move this to the start of the section as it is more a concluding point.

COMMENT	RESPONSE
Stefano Pisani	
Chapter III. VAT compliance gap in EU Section III.a. Section III.b. mentions the composition effect. This effect is clearly visible in Figure 17, from Section III.a., comparing the VAT gap as a percentage of the VTTL of EUR27 and EUR28 in the years 2018 and 2019. In both years, the former is higher than the latter and this is mainly due to the exit of the United Kingdom, which has a lower VAT/VTTL gap ratio than the average of all other countries. This aspect could be mentioned to better explain the composition effect. **Section III.b**, The analyses of the impact of **the tourism and hospitality sector** on the VAT gap during the COVID-19 pandemic is very informative and sheds light on important aspects of the causes of VAT gap compliance trends, but there is an significant issue to mention. Trends in the absolute value of the VAT gap, Figure 22, provide no information on compliance trends because the absolute value is affected by the business cycle and changes in tax legislation as well as changes in compliance behavior. If we want to focus on changes in compliance behavior, we need to use only the ratio of VAT gap to VTTL (relative compliance gap). Thus, if the relative compliance gap in tourism destinations, in 2020, has not decreased, it means that the composition effect relative to the tourism sector has not been able to influence the total relative compliance GAP and this might happen mainly because of 2 aspects (which might be associated): 1. There are other sectors with a higher non-compliance ratio than the tourism sector that did not reduce their share in the total economy during the pandemic. 2. During the pandemic, taxpayers changed their behavior, in the sense of increased noncompliance behavior. **VAT compliance in Germany.** The two paragraphs that follow Figure 24 may confuse the reader, because the first states that “the compliance rate is negatively correlated with the statutory tax rate itself” and the second writes “the EC/CASE report found that classical tax theory could predict the positive relationship between a country's VAT burden (measured as VAT revenue divided by GDP) and its VAT compliance gap.” I would suggest always referring to the VAT compliance gap and then always referring to the positive correlation (or vice versa). Also, it would be better to replace the term “negative relationship” with “negative impact,” because the term relationship could be confused with correlation. Please rephrase the statement “Descriptive statistics support the hypothesis that a higher VAT rate leads to lower VAT compliance” as “Descriptive statistics, although not providing conclusive evidence on the causal effect, support the hypothesis	We agree that business cycles etc. impact the data displayed in Figure 22. We decided to keep the figure as it is to pick up the storyline presented in last years report. However, we have included this argument and used it as a bridge to the subsequent sections that refer to the VAT compliance gap (% of VTTL). Second paragraph: We inserted the sentence suggested. We have included the formula applied. Concerning success stories: We have added the reduction on unintentional errors to the text. Regarding the rationale behind choosing instrumental variable, that has already been explained under the heading “Estimation approach”.

COMMENT	RESPONSE
Stefano Pisani	
that a higher VAT rate leads to lower VAT compliance." In the comments to **Figures 25(a) and (b)**, please explain how VAT compliance is calculated in terms of the VAT gap, I guess something like 1- VAT gap? The section does not provide an explanation of the relationship between VAT rate change and VAT compliance, but this was not the purpose of the analysis, which cannot achieve this result using descriptive statistics and the expert survey. As clearly pointed out at the end of the paragraph, the purpose of the analysis is to provide evidence to identify the multiplicity of factors that could influence VAT compliance. **III.c. Success stories on increasing compliance and associated measures** **Figures 29 and 30**. A good point to support the analysis of the impact of electronic VAT returns (such as SAF-T) and online cash registers on VAT compliance is that they were introduced in each country in different years, and this can eliminate the bias due to the effect of the international business cycle and consider the different trends of VAT compliance in the EU. **Decisive factors impacting VAT compliance and the effectiveness of measures. Experts** highlighted, among others, the following points to explain the different impact of digitization on VAT compliance: 1. measure design and the quality of the digital solution as a key aspect, 2. the general public digital infrastructure, 3. the 'IT infrastructure and related know-how of the Tax Administration. These aspects are of key importance and are mentioned in the general comments. At the end of the section, you mention three main areas that may have an impact on VAT compliance and the effectiveness of recently introduced measures, based on interviews conducted by experts. I wonder why you did not elaborate on the relevance of reducing unintentional errors, which is one of the most cited components of the tax gap. Could you say something about that?	Have edited the last paragraph to include this explanation.

COMMENT	RESPONSE
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III.d Impact of e-commerce and digital payments on VAT compliance. **Estimation approach.** I suggest to explain your rationale for choosing instrumental variables in the first stage of the model. The panel regression results seem reasonable and in line with several theories on this issue. One possible explanation for the positive net effect of e-commerce on VAT compliance could be that small-scale evasion by unregistered suppliers was widespread before the growth of e-commerce and, although smaller in unit size, its amount was higher than that of fraud. This is also related to the fact that conducting checks on small businesses is very costly for tax administrations.	
V. VAT compliance and policy gaps – individual country assessment. In the country assessment paragraphs, I suggest adding an additional chart comparing the policy gap and the compliance gap, both divided by household consumption (or GDP) and the ratio of active revenue to household consumption (or GDP). This graph provides an effective overview of how policy parameters and noncompliant behavior affect VAT revenue performance. **Annex C** provides a very detailed analysis of VAT deductibility in the accommodation, catering, entertainment, library, cultural gambling, sports and recreational services sectors. The proposed new procedure is a significant step forward from the previous one in terms of accuracy and reliability of data sources. **The refinement of the treatment of propex coefficients** is explained in the same Annex. Estimating propex is a very challenging aspect of the VAT gap methodology, both because of the significance of this item in the total (about 19 percent) and the difficulty of finding reliable data sources. The review process was based primarily on an analysis of the VAT legislation, supplemented by a very detailed country-by-country description (Table 101). To further refine this approach, I wonder if it would be possible to ask member states to provide the exemption rate, by sector, resulting from the VAT forms. **The differentiation of weighted average VAT rates for domestic and intermediate consumption** is a very important topic from a methodological point of view, but the way it is presented in the report appears difficult to read, especially since transactions within the productive chain are taken into account that these are difficult to identify when using the VAT gap estimation model based on demand data. To further clarify I suggest specifying at the outset where the problem impacts on	Thank you for these comments. As recommended by the reviewer, we have already requested detailed figures regarding the exemption rate by sector (these values are listed in the second column). The sources of these figures, whether from national accounts or tax returns registers, are often unknown; therefore, we have validated them to ensure accuracy. Regarding methodological considerations on rate differentiation, we have revised the text to enhance readability.

COMMENT	RESPONSE
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the formula [5], illustrated in Sec. VIIb, and when laying out the individual cases, financial service, rent of building, etc., accompany the explanation with simplified diagrams of the productive chains and where the problems impact. Please verify if the VAT legislation of tour operator is consistent with the ESA rule. According to the ESA rules the revenues of travel agencies consist mainly of fees and commissions charged, whereas revenues of tour operators consist of the full expenditures made by travelers. **Assessment of household final consumption liability modelling** To update the contingency matrices in the future you could use instead of the RAS in method the Stone method (Stone, Champernowne, Meade (1942), “The precision of national income estimates,” Review of Economic Studies, vol. 9, pp. 111-125), which allow the matrices to be balanced according to a system of variances and covariances representing the reliability of individual cells.	For travel agents and tour operators, the refined treatment results from aligning ESA standards with VAT legislation and the scope of TOMS. In most cases, travel agents are subject to TOMS, whereas tour operators are not.

Review of the Draft Final Report by Sebastian James

COMMENT	RESPONSE
Sebatian James, Professor of Practice in the Sanford School of Public Policy, Duke	
The final draft has incorporated most of my suggestions sent during the previous draft especially elaborating the methodology of computing the VAT Compliance Gap.	Thank you for your thorough review.
The Methodology section may benefit by using a language that is more accessible to someone who is not necessarily well versed in the operation of a Value Added Tax. In my opinion, students of taxation and policy makers without a deep knowledge of taxation may find the methodology a little difficult to understand. I have attached along with my comments a short VAT primer to the authors who may decide to adopt it, modify it, or prepare one themselves.	Thank you for sharing the VAT primer. While a significant revision of the methodological descriptions may not be feasible this year, the adjustments based on the VAT primer will be reconsidered next year.
To a lay reader, given the excellent analysis and the methodology, a natural question would be if the VTTL could be available by sector. Is this possible to do and if not, what are the data or methodological limitations that do not allow us to do it?	Unfortunately, the consumption based approach allows to break most of the VTTL components only by group of product ad services. To derive the sectoral VTTL, so called, production-side approach would need to be introduced. The team has analysed the feasibility of this approach. Unfortunately, as it is more data intensive, required data would likely be unavailable for many Member States.
Case Studies are an excellent way to add value to the quantitative analysis. I appreciate the effort.	Thank you.
Very good analysis of the impact of macroeconomic, especially inflation, and geo-political factors impacting the VAT base.	Thank you.
Best practices on visualization - (example - Figure 6). I appreciate the effort.	Thank you.

In Page 14, 1b. in the bullet point "**Household final consumption by category** – household final consumption in service categories can impact compliance negatively, as the services sector can be more complex to tax effectively compared to traditional taxable goods." Perhaps, the word "difficult to tax" would be more appropriate. Similarly the bullet point on E-commerce, you may use "difficulties" in place of complexities. Alternatively you may write, "as the services sector can be more complex and hence more difficult to tax effectively compared to traditional taxable goods."	Wording was adjusted to consider this comment.
Page 15, last sentence of the last paragraph, "The share of household final consumption on services has remained unchanged, which can affect VAT compliance, as the services sector can be more complex to tax effectively compared to traditional taxable goods." It is not clear if this is what was intended as the discussion in the previous paragraphs was pointing to an increase in the share of the service sector. Perhaps, you wanted to say that overall, the share of household final consumption on services has remained unchanged, but that for certain parts of the sector such as restaurants grew. (which is discussed on the following paragraphs). Perhaps you are making a subtle point which is not coming through.	Wording was adjusted to consider this comment.
Figure 14 (share of turnover from online sales) does not appear to convey much information due to the selection of the chart. A line chart may be more appropriate.	This chart has been removed to reduce confusion
Figure 15 looks at correlation between the household final consumption growth and the vat gap growth for 2022 and 2021. Could you mention the correlation coefficient in the paragraph?	We refrain from including this in the text as it was confusing for the Commission and have also removed it from the chart.
Page 23 policy context section. In the last paragraph, a mention has been made of "VAT groups" in Poland. Please explain what this is in the text or in a footnote.	Explained as advised.

Page 30 last paragraph when read with the figure Figure 22 is confusing. You are making a subtle point. In general the change in VAT compliance gap for tourist destinations is lower than for others (except for the COVID year). You are discussing the first difference in the VAT Compliance gap (not sure if this is the percentage point change or percentage change). Even if this is clarified you may need to explain this second order effect more clearly.	We agree that the section is quite confusing. As it does not add much to the main analysis we decided to shorten it significantly.
1.b. In the discussion on Tourism, as mentioned above, this would benefit from an estimation of sector-wise VAT Compliance Gap.	We agree. However, unfortunately sector-wide compliance gap estimates are not available.
Page 36: In the first paragraph you use the term VAT compliance (and in the figures 25 and 26). As you have previously referred to “VAT Compliance gap”, you may make it clear that you are looking at “VAT Compliance” (and not the gap) as defined by % of VTTL (or another measure you are using).	We have inserted a footnote and highlighted the measures used to draw the readers attention to the use of both indicators
Figures 25 and 26: These are important figures. I would suggest that the labelling be more precise to indicate you mean “VAT Compliance 2020 – 2019” and “effective VAT Rate 2020 – 2019” or “VAT Rate 2020 – VAT Rate 2019”. Because some readers may interpret this as 2019 minus 2020.	We are not sure what you are referring to. We have inserted a note below Figure 25 explaining the variables presented in more detail. Moreover, the caption of Figure 26 has been modified.
Section IIIc. And Figure 27. It would be useful to show the VAT collection during the period for the countries being discussed.	Could you elaborate why you think that would be a good addition? We think the case study is quite complex and extensive already. Thus, we tried to really streamline the information displayed and only show the most relevant data. Adding more information might water down the main messages.
Section IIIc. This is an excellent discussion of the measures that were undertaken in some countries and their potential impact on compliance.	Thank you.
IV. The discussion on VAT Policy Gap is very helpful for policy design.	Thank you.
V. Country analysis is very helpful for the policy makers by giving an accessible summary of their country’s performance.	Thank you.

VII. VAT Compliance Methodology great addition. The methodology is well established and correct.	Thank you.
VII. It would be helpful to mention how the VAT registration thresholds on the VTTL.	Thank you.

Annex E. Statistical appendix

Table 108: VTTL (EUR million)

	2016	2017	2018	2019	2020	2021	2022	2023
BE	*32 263*	*33 887*	35 364	36 468	33 590	36 809	40 501	42 334
BG	*5 058*	*5 323*	5 630	6 239	5 993	6 930	8 432	
CZ	*15 601*	*16 926*	18 560	19 567	18 162	19 376	22 822	24 651
DK	*29 497*	*30 776*	32 004	32 598	32 466	35 371	38 943	
DE	*241 411*	*249 693*	258 511	266 666	235 866	271 427	298 557	
EE	*2 092*	*2 305*	2 469	2 628	2 595	2 891	3 461	3 694
IE	*14 028*	*14 107*	15 168	16 292	15 326	16 637	19 238	
EL	*19 075*	*20 663*	20 503	20 240	16 461	18 369	21 580	
ES	*74 791*	*80 133*	82 896	86 066	73 911	85 773	96 787	101 226
FR	*169 312*	*178 555*	182 436	189 922	176 118	197 189	212 146	226 947
HR	*6 544*	*6 886*	7 389	7 392	7 034	8 585	10 112	
IT	*138 932*	*140 593*	139 532	140 704	125 728	135 734	154 879	164 206
CY	*1 713*	*2 128*	2 235	2 350	2 132	2 325	2 688	
LV	*2 372*	*2 548*	2 826	2 944	2 900	3 208	3 833	4 113
LT	*4 097*	*4 426*	4 637	4 872	5 029	5 562	6 610	7 192
LU	*3 503*	*3 561*	3 845	3 889	4 102	4 515	4 963	5 337
HU	*12 344*	*13 682*	14 422	15 655	14 617	15 988	17 505	
MT	*950*	*1 050*	1 200	1 288	1 160	1 343	1 605	1 777
NL	*50 500*	*53 024*	59 060	65 337	64 720	69 024	75 919	81 754
AT	*29 768*	*30 909*	31 954	32 594	29 877	31 473	36 643	39 371
PL	*38 733*	*42 897*	47 095	49 215	47 363	52 260	52 046	61 434
PT	*17 890*	*18 653*	19 734	20 543	18 105	19 995	23 011	24 456
RO	*17 423*	*18 249*	19 181	21 125	21 003	23 798	27 717	32 349
SI	*3 506*	*3 620*	3 940	4 197	3 753	4 455	5 144	5 616
SK	*6 783*	*7 125*	7 552	8 168	7 995	8 540	10 025	
FI	*20 679*	*21 723*	22 204	23 047	22 720	24 273	26 443	26 673
SE	*44 017*	*45 811*	44 515	44 782	45 497	51 999	54 993	
UK	*187 922*	*183 644*	188 440	190 221				
EU28	***1 190 804***	***1 232 897***	**1 273 302**	**1 315 010**				
EU27	***1 002 882***	***1 049 254***	**1 084 863**	**1 124 789**	**1 034 227**	**1 153 848**	**1 276 601**	

Source: own calculations, download underlying data.

Table 109: Household VAT liability (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*18 522*	*19 148*	19 731	20 208	18 268	19 979	22 158
BG	*3 735*	*3 986*	4 057	4 424	4 192	4 946	6 029
CZ	*9 900*	*10 661*	11 457	11 855	10 550	11 272	13 579
DK	*17 289*	*18 052*	18 836	19 202	18 630	20 259	22 217
DE	*145 894*	*149 768*	153 562	157 605	132 962	151 156	168 180
EE	*1 437*	*1 525*	1 628	1 715	1 658	1 859	2 269
IE	*7 816*	*7 278*	8 014	8 612	7 947	8 875	10 194
EL	*14 745*	*15 827*	16 604	16 239	12 632	14 175	17 117
ES	*55 178*	*58 709*	60 170	61 266	48 848	56 806	64 018
FR	*99 691*	*102 853*	106 028	108 486	98 380	108 908	119 284
HR	*4 792*	*5 079*	5 353	5 411	4 652	5 920	7 221
IT	*99 315*	*100 344*	102 153	103 383	88 716	93 124	107 716
CY	*1 121*	*1 231*	1 298	1 341	1 107	1 282	1 533
LV	*1 868*	*1 963*	2 075	2 132	2 044	2 280	2 876
LT	*3 394*	*3 664*	3 846	3 995	3 951	4 428	5 165
LU	*1 423*	*1 450*	1 540	1 558	1 474	1 698	1 934
HU	*9 033*	*9 528*	9 541	10 145	8 963	9 862	10 889
MT	*542*	*588*	633	656	468	548	731
NL	*26 218*	*27 205*	30 541	33 955	32 529	35 451	40 077
AT	*19 885*	*20 658*	21 358	21 789	18 965	19 128	23 296
PL	*27 434*	*30 211*	32 277	33 968	32 579	36 120	34 794
PT	*13 345*	*13 791*	14 455	15 052	12 839	14 017	16 978
RO	*10 946*	*11 495*	12 362	13 090	12 168	14 063	16 530
SI	*2 575*	*2 679*	2 840	3 025	2 645	3 125	3 611
SK	*5 054*	*5 437*	5 732	6 028	6 001	6 308	7 533
FI	*11 575*	*11 830*	12 121	12 205	11 684	12 570	13 748
SE	*22 604*	*23 327*	22 877	22 789	22 653	26 502	27 797
UK	*124 841*	*122 972*	126 962	128 370			
EU28	***760 169***	***781 259***	**808 051**	**828 504**			
EU27	***635 327***	***658 288***	**681 089**	**700 134**	**617 503**	**684 658**	**767 475**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 110: NPISH and government VAT liability (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*1 272*	*1 401*	1 472	1 532	1 572	1 704	1 864
BG	*145*	*152*	175	196	230	271	287
CZ	*799*	*788*	896	974	999	1 037	1 099
DK	*687*	*714*	711	733	757	814	822
DE	*6 825*	*6 924*	7 199	7 648	7 443	8 640	9 052
EE	*64*	*68*	76	86	87	96	107
IE	*202*	*194*	667	727	811	883	974
EL	*688*	*734*	674	702	844	865	773
ES	*2 494*	*2 715*	2 894	3 107	3 101	3 288	3 480
FR	*1 695*	*1 737*	1 777	1 835	1 769	1 936	2 010
HR	*195*	*216*	191	192	485	541	578
IT	*2 343*	*1 689*	1 597	1 605	1 975	2 072	2 332
CY	*27*	*26*	28	29	33	40	44
LV	*56*	*66*	69	69	73	81	83
LT	*44*	*46*	43	52	52	60	65
LU	*33*	*43*	37	38	41	47	47
HU	*362*	*422*	474	608	731	731	742
MT	*47*	*53*	57	64	75	82	84
NL	*571*	*568*	489	713	700	763	831
AT	*947*	*958*	1 486	1 533	1 587	1 738	1 854
PL	*1 743*	*1 821*	1 958	2 094	2 147	2 416	2 636
PT	*487*	*535*	550	598	601	631	663
RO	*793*	*718*	769	907	980	1 005	1 088
SI	*85*	*83*	97	99	107	117	122
SK	*98*	*98*	132	104	103	115	128
FI	*504*	*489*	520	565	566	604	714
SE	*1 768*	*1 821*	1 827	1 904	1 906	2 095	2 096
UK	*3 733*	*3 527*	3 428	3 656			
EU28	***28 708***	***28 604***	**30 293**	**32 371**			
EU27	***24 975***	***25 078***	**26 865**	**28 715**	**29 775**	**32 670**	**34 574**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 111: Intermediate consumption VAT liability (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*7 017*	*7 331*	7 815	8 215	7 664	8 464	9 203
BG	*586*	*645*	761	819	770	887	1 072
CZ	*2 940*	*3 206*	3 506	3 716	3 624	3 881	4 552
DK	*6 933*	*7 209*	7 439	7 635	7 771	8 451	9 464
DE	*47 417*	*49 274*	52 101	54 109	52 132	61 620	65 770
EE	*263*	*319*	344	380	364	409	489
IE	*3 820*	*4 492*	4 121	4 504	4 309	4 582	5 156
EL	*2 006*	*2 189*	1 873	1 901	1 834	1 931	2 113
ES	*8 552*	*10 204*	10 634	11 367	11 424	13 234	15 606
FR	*30 568*	*32 095*	32 866	34 213	33 804	38 795	41 146
HR	*970*	*991*	1 015	1 019	850	997	1 167
IT	*21 634*	*22 324*	22 371	22 629	22 328	22 703	24 689
CY	*401*	*441*	466	502	507	491	508
LV	*323*	*347*	442	500	496	539	628
LT	*409*	*439*	456	499	548	632	771
LU	*1 138*	*1 189*	1 384	1 471	1 581	1 659	1 741
HU	*1 692*	*1 882*	2 040	2 181	2 164	2 472	2 767
MT	*277*	*311*	387	449	504	573	626
NL	*13 687*	*14 220*	16 346	17 652	18 177	18 873	19 675
AT	*4 183*	*4 317*	4 385	4 574	4 637	5 387	5 772
PL	*5 847*	*6 384*	7 401	7 644	7 144	8 088	8 177
PT	*2 732*	*2 925*	3 055	3 220	3 081	3 525	3 349
RO	*1 729*	*1 837*	2 095	2 279	2 556	2 749	2 903
SI	*469*	*461*	519	560	541	630	708
SK	*877*	*908*	966	1 163	1 078	1 311	1 447
FI	*4 396*	*4 651*	4 737	4 850	4 943	5 544	5 903
SE	*10 569*	*10 815*	10 628	10 857	11 205	12 388	13 026
UK	*40 605*	*38 441*	38 807	38 869			
EU28	***222 037***	***229 847***	**238 958**	**247 775**			
EU27	***181 433***	***191 406***	**200 151**	**208 906**	**206 035**	**230 814**	**248 428**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 112: GFCF VAT liability (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*4 808*	*5 319*	5 653	5 769	5 541	6 103	6 573
BG	*585*	*532*	641	810	791	813	1 027
CZ	*1 971*	*2 275*	2 786	3 097	3 095	3 294	3 661
DK	*3 828*	*4 025*	4 225	4 228	4 437	4 878	5 322
DE	*39 483*	*41 422*	44 735	46 525	42 631	48 618	53 886
EE	*318*	*381*	420	444	489	528	596
IE	*1 995*	*1 839*	2 073	2 113	2 083	2 099	2 722
EL	*1 355*	*1 605*	1 047	1 059	888	1 110	1 236
ES	*7 891*	*7 758*	8 356	9 407	9 788	11 714	12 808
FR	*32 168*	*36 803*	37 305	40 328	37 900	43 209	44 976
HR	*567*	*586*	820	785	1 021	1 097	1 107
IT	*13 883*	*14 625*	13 696	15 098	14 588	19 719	22 190
CY	*159*	*427*	413	445	452	472	549
LV	*175*	*217*	293	299	338	365	312
LT	*470*	*526*	570	646	810	785	948
LU	*625*	*580*	565	462	724	664	763
HU	*1 099*	*1 658*	2 234	2 652	2 730	2 877	3 071
MT	*58*	*71*	102	110	106	126	148
NL	*9 481*	*10 487*	11 272	12 533	12 921	13 542	14 836
AT	*3 284*	*3 437*	3 416	3 524	3 611	3 851	4 163
PL	*3 139*	*3 890*	4 824	4 866	4 872	4 954	5 578
PT	*941*	*1 031*	1 187	1 230	1 283	1 473	1 608
RO	*3 638*	*3 950*	4 018	4 791	5 176	5 845	7 007
SI	*303*	*329*	402	427	402	512	627
SK	*763*	*680*	761	915	860	852	967
FI	*3 513*	*3 987*	4 300	4 819	4 927	4 926	5 404
SE	*8 486*	*9 307*	8 857	8 912	9 493	10 751	11 794
UK	*17 396*	*16 997*	17 269	18 516			
EU28	***162 383***	***174 745***	**182 241**	**194 813**			
EU27	***144 987***	***157 748***	**164 972**	**176 296**	**171 955**	**195 178**	**213 880**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 113: Net adjustments (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*644*	*688*	693	744	545	559	702
BG	*8*	*7*	- 3	- 9	10	13	16
CZ	*- 9*	*- 4*	- 86	- 75	- 106	- 107	- 70
DK	*761*	*777*	792	799	871	969	1 118
DE	*1 791*	*2 304*	913	779	698	1 394	1 670
EE	*11*	*12*	2	3	- 2	0	1
IE	*195*	*303*	293	336	176	198	192
EL	*281*	*308*	305	339	264	289	340
ES	*675*	*746*	842	919	751	731	875
FR	*5 190*	*5 067*	4 461	5 060	4 265	4 342	4 730
HR	*20*	*13*	10	- 16	26	30	39
IT	*1 758*	*1 611*	- 285	-2 011	-1 879	-1 885	-2 048
CY	*5*	*4*	29	33	33	39	53
LV	*- 49*	*- 45*	- 53	- 56	- 51	- 57	- 66
LT	*- 220*	*- 249*	- 279	- 319	- 333	- 343	- 339
LU	*284*	*300*	319	360	281	447	478
HU	*158*	*191*	134	69	31	46	36
MT	*27*	*27*	22	9	8	14	17
NL	*543*	*545*	411	484	394	395	500
AT	*1 469*	*1 539*	1 310	1 175	1 077	1 369	1 558
PL	*571*	*591*	635	643	620	682	860
PT	*385*	*372*	487	442	302	349	412
RO	*317*	*250*	- 65	57	124	136	189
SI	*74*	*68*	83	86	58	71	76
SK	*- 9*	*2*	- 38	- 43	- 47	- 45	- 50
FI	*691*	*768*	527	609	600	629	674
SE	*590*	*541*	326	321	241	263	279
UK	*1 347*	*1 707*	44 209	810			
EU28	***17 507***	***18 441***	**55 994**	**11 548**			
EU27	***16 160***	***16 735***	**11 785**	**10 738**	**8 958**	**10 527**	**12 244**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 114: VAT revenues (EUR million)

	2016	2017	2018	2019	2020	2021	2022	2023
BE	*28 750*	*29 763*	31 053	31 702	29 058	34 234	36 031	37 402
BG	*4 417*	*4 873*	5 128	5 655	5 635	6 671	7 786	8 329
CZ	*13 101*	*14 703*	16 075	16 931	16 022	18 084	21 857	23 860
DK	*26 770*	*28 049*	29 199	29 892	31 076	33 772	35 583	34 614
DE	*218 779*	*226 582*	235 130	244 111	221 562	259 435	285 665	287 249
EE	*1 975*	*2 149*	2 331	2 483	2 469	2 847	3 309	3 476
IE	*12 603*	*13 060*	14 149	15 271	13 950	16 816	18 936	20 018
EL	*14 333*	*14 642*	15 288	15 390	12 925	15 160	18 621	19 756
ES	*70 214*	*73 970*	77 536	79 301	69 435	82 249	92 344	94 015
FR	*154 490*	*162 011*	168 177	174 424	162 089	185 350	199 362	205 036
HR	*5 991*	*6 404*	6 841	7 305	6 322	7 647	8 895	10 480
IT	*102 086*	*107 576*	109 333	111 464	99 683	120 980	138 533	139 998
CY	*1 654*	*1 720*	1 955	2 066	1 786	2 182	2 706	2 979
LV	*2 032*	*2 164*	2 449	2 632	2 541	2 880	3 639	3 748
LT	*3 028*	*3 310*	3 522	3 856	4 009	4 688	5 644	5 911
LU	*3 148*	*3 382*	3 534	3 686	3 755	4 183	4 779	4 982
HU	*10 595*	*11 729*	12 950	13 916	13 429	15 230	17 100	18 474
MT	*712*	*810*	920	934	849	1 001	1 190	1 269
NL	*47 849*	*49 833*	52 712	58 115	58 971	65 400	69 928	75 349
AT	*27 301*	*28 304*	29 323	30 405	28 149	30 657	35 543	37 821
PL	*30 854*	*36 339*	40 423	42 383	41 856	49 317	47 672	54 999
PT	*15 767*	*16 810*	17 868	18 786	16 804	19 186	22 711	23 870
RO	*10 968*	*11 650*	12 890	13 795	13 368	15 511	19 238	21 449
SI	*3 318*	*3 481*	3 763	3 962	3 553	4 297	4 673	5 179
SK	*5 424*	*5 919*	6 319	6 830	6 749	7 366	8 559	9 937
FI	*19 694*	*20 404*	21 364	21 974	22 005	23 551	25 061	25 087
SE	*42 788*	*44 098*	43 403	43 412	43 981	49 215	51 954	48 268
UK	*167 827*	*162 724*	168 703	176 317				
EU28	***1 046 469***	***1 086 459***	**1 132 338**	**1 176 999**				
EU27	***878 642***	***923 735***	**963 635**	**1 000 682**	**932 031**	**1 077 907**	**1 187 318**	**1 223 554**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 115: VAT compliance gap (EUR million)

	2016	2017	2018	2019	2020	2021	2022	2023
BE	*3 513*	*4 124*	4 311	4 766	4 532	2 575	4 469	4 933
BG	*641*	*450*	501	584	358	259	645	
CZ	*2 499*	*2 223*	2 485	2 636	2 140	1 291	965	791
DK	*2 727*	*2 728*	2 805	2 706	1 390	1 598	3 360	
DE	*22 632*	*23 111*	23 381	22 555	14 304	11 992	12 892	
EE	*117*	*156*	138	146	126	44	152	218
IE	*1 426*	*1 047*	1 020	1 021	1 376	- 179	302	
EL	*4 742*	*6 021*	5 215	4 850	3 536	3 209	2 959	
ES	*4 577*	*6 163*	5 360	6 765	4 476	3 524	4 443	7 211
FR	*14 822*	*16 544*	14 259	15 498	14 029	11 839	12 784	21 911
HR	*553*	*482*	548	87	712	937	1 216	
IT	*36 846*	*33 017*	30 199	29 240	26 045	14 754	16 346	24 208
CY	*59*	*408*	280	284	346	143	- 18	
LV	*340*	*384*	377	312	360	328	193	365
LT	*1 070*	*1 116*	1 115	1 017	1 020	875	966	1 281
LU	*355*	*180*	311	203	347	332	184	355
HU	*1 748*	*1 953*	1 473	1 739	1 188	758	405	
MT	*238*	*240*	281	354	311	342	415	508
NL	*2 651*	*3 191*	6 348	7 222	5 749	3 624	5 991	6 405
AT	*2 466*	*2 605*	2 631	2 188	1 728	817	1 101	1 550
PL	*7 879*	*6 558*	6 672	6 831	5 507	2 943	4 374	6 435
PT	*2 123*	*1 844*	1 866	1 757	1 302	810	300	586
RO	*6 454*	*6 599*	6 291	7 330	7 635	8 287	8 479	10 899
SI	*188*	*138*	177	234	200	159	472	437
SK	*1 360*	*1 206*	1 233	1 337	1 246	1 174	1 466	
FI	*985*	*1 319*	840	1 073	715	722	1 382	1 586
SE	*1 228*	*1 713*	1 112	1 370	1 516	2 784	3 039	
UK	*20 095*	*20 920*	19 737	13 904				
EU28	***144 335***	***146 439***	**140 965**	**138 011**				
EU27	***124 240***	***125 519***	**121 228**	**124 107**	**102 196**	**75 941**	**89 283**	

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 116: VAT compliance gap (%)

	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	2023
Belgium	7.11%	11.67%	9.43%	12.61%	11.05%	10.77%	11.09%	9.32%	13.07%	13.71%	12.01%	13.37%	15.16%	13.44%	9.84%	12.91%	11.18%	12.46%	12.19%	13.07%	13.49%	7.00%	11.04%	11.65%
Bulgaria	33.39%	35.90%	43.99%	32.89%	23.70%	19.62%	16.68%	22.14%	14.07%	24.92%	21.92%	23.69%	19.39%	14.27%	20.13%	17.48%	10.26%	6.06%	8.91%	9.36%	5.98%	3.73%	7.65%	-
Czechia	23.83%	23.07%	23.45%	25.66%	6.33%	4.35%	9.94%	13.79%	17.59%	19.17%	22.07%	17.51%	20.60%	19.49%	17.01%	17.75%	15.36%	12.47%	13.39%	13.47%	11.78%	6.66%	4.23%	3.21%
Denmark	13.31%	12.89%	12.26%	11.65%	11.76%	11.02%	11.10%	10.78%	12.88%	11.30%	11.70%	12.10%	11.93%	12.91%	11.50%	11.02%	9.41%	9.02%	8.76%	8.30%	4.28%	4.52%	8.63%	-
Germany	9.90%	12.30%	11.82%	11.58%	11.85%	11.74%	10.39%	12.13%	11.26%	8.51%	8.71%	9.99%	11.21%	11.46%	11.35%	8.68%	8.89%	8.78%	9.04%	8.46%	6.06%	4.42%	4.32%	-
Estonia	10.66%	14.23%	14.95%	15.79%	21.66%	12.11%	8.63%	7.42%	17.40%	10.98%	12.18%	14.10%	14.23%	15.79%	12.14%	7.38%	7.20%	6.79%	5.60%	5.54%	4.85%	1.53%	4.40%	5.90%
Ireland	10.25%	2.27%	4.77%	6.68%	3.81%	8.01%	7.98%	9.42%	11.47%	15.81%	12.71%	12.00%	12.00%	7.02%	3.51%	9.07%	6.59%	9.19%	6.72%	6.27%	8.98%	-1.07%	1.57%	-
Greece	15.65%	12.85%	13.70%	18.21%	18.84%	21.68%	22.67%	22.34%	20.09%	25.91%	22.51%	29.99%	24.78%	28.22%	21.85%	25.70%	24.69%	28.97%	25.43%	23.96%	21.48%	17.47%	13.71%	-
Spain	6.49%	8.34%	9.66%	6.79%	5.10%	0.72%	1.37%	9.93%	21.98%	34.57%	11.87%	16.26%	12.63%	14.46%	11.15%	7.17%	7.24%	7.69%	6.47%	7.86%	6.06%	4.11%	4.59%	7.12%
France	3.68%	5.58%	7.13%	7.58%	6.42%	6.29%	6.86%	6.82%	8.62%	12.78%	7.98%	6.75%	11.04%	9.37%	9.63%	8.77%	8.09%	8.60%	7.82%	8.16%	7.97%	6.00%	6.03%	9.65%
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.92%	8.40%	6.89%	7.41%	1.18%	10.12%	10.92%	12.03%	-
Italy	24.21%	26.24%	25.52%	29.57%	29.99%	28.98%	25.31%	24.95%	27.86%	32.96%	25.36%	28.47%	27.73%	29.08%	27.67%	25.91%	25.57%	22.38%	21.64%	20.78%	20.72%	10.87%	10.55%	14.74%
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.33%	19.25%	12.52%	12.09%	16.22%	6.17%	-0.67%	-
Latvia	14.77%	19.57%	20.63%	20.57%	21.82%	13.99%	10.27%	9.76%	24.64%	40.99%	33.19%	35.06%	26.75%	27.10%	23.56%	23.18%	15.87%	17.29%	13.34%	10.60%	12.41%	10.23%	5.05%	8.87%
Lithuania	25.37%	28.60%	27.75%	33.12%	37.27%	31.10%	27.76%	23.62%	23.87%	34.91%	29.61%	29.77%	31.01%	31.03%	30.22%	26.94%	26.11%	25.21%	24.04%	20.87%	20.29%	15.72%	14.62%	17.82%
Luxembourg	14.98%	14.67%	12.88%	12.67%	10.43%	8.77%	8.46%	10.69%	12.50%	8.64%	8.74%	9.09%	8.62%	9.81%	10.12%	9.11%	10.08%	3.83%	8.09%	5.23%	8.46%	7.36%	3.70%	6.65%
Hungary	17.62%	23.52%	25.57%	21.63%	19.09%	22.74%	22.99%	20.11%	22.21%	22.00%	22.30%	22.05%	22.25%	21.67%	19.10%	16.48%	14.19%	14.30%	10.21%	11.11%	8.13%	4.74%	2.31%	-
Malta	32.65%	33.31%	31.62%	31.32%	36.03%	25.23%	26.00%	28.94%	28.05%	26.35%	30.45%	31.47%	32.85%	31.97%	33.07%	23.58%	24.56%	22.35%	23.38%	27.47%	26.80%	25.50%	25.89%	28.59%
Netherlands	16.48%	15.59%	14.36%	13.76%	11.07%	10.52%	10.05%	7.89%	11.36%	16.49%	9.09%	13.51%	12.92%	13.68%	12.65%	13.72%	8.90%	9.67%	10.75%	11.05%	8.88%	5.25%	7.89%	7.83%
Austria	7.09%	8.82%	5.90%	9.18%	9.61%	9.67%	11.98%	10.90%	10.87%	7.14%	9.24%	11.04%	8.33%	9.65%	8.58%	8.05%	7.67%	7.81%	8.23%	6.71%	5.78%	2.59%	3.00%	3.94%
Poland	26.29%	30.37%	27.74%	26.98%	26.36%	18.69%	14.65%	11.39%	18.07%	24.20%	21.50%	21.73%	27.99%	27.53%	25.37%	25.60%	21.30%	16.67%	14.17%	13.88%	11.63%	5.63%	8.40%	10.48%
Portugal	-0.41%	1.43%	2.13%	2.18%	2.90%	-0.54%	1.84%	3.33%	4.68%	15.68%	13.28%	13.51%	15.77%	16.00%	14.06%	13.00%	12.19%	10.23%	9.46%	8.55%	7.19%	4.05%	1.30%	2.40%
Romania	36.42%	43.76%	34.25%	34.13%	39.65%	29.27%	32.06%	30.89%	32.10%	44.08%	39.38%	35.27%	36.57%	36.86%	39.29%	33.54%	35.94%	35.74%	32.80%	34.70%	36.35%	34.82%	30.59%	33.69%
Slovenia	3.61%	5.56%	5.02%	5.92%	5.77%	5.39%	4.97%	6.80%	9.05%	10.88%	8.78%	6.55%	9.54%	5.93%	9.85%	8.02%	5.56%	4.03%	4.50%	5.58%	5.33%	3.56%	9.17%	7.79%
Slovakia	20.75%	20.62%	21.93%	14.43%	17.37%	13.92%	20.65%	24.56%	23.47%	29.83%	31.23%	25.43%	34.96%	29.65%	27.86%	24.95%	19.99%	16.88%	16.32%	16.37%	15.59%	13.75%	14.62%	-
Finland	6.56%	7.72%	7.25%	7.34%	8.04%	5.97%	6.40%	8.95%	9.68%	4.57%	8.27%	5.00%	4.75%	5.21%	5.46%	4.81%	4.12%	5.43%	3.78%	4.66%	3.15%	2.97%	5.22%	5.95%
Sweden	7.84%	8.01%	7.75%	6.91%	6.57%	6.26%	7.26%	6.05%	4.93%	4.07%	3.77%	4.49%	7.40%	4.13%	3.92%	3.58%	2.31%	3.26%	2.50%	3.06%	3.33%	5.35%	5.53%	-
EU27 (median)	**14.77%**	**14.23%**	**13.70%**	**13.76%**	**11.76%**	**11.02%**	**10.39%**	**10.78%**	**14.07%**	**16.49%**	**12.71%**	**14.10%**	**15.16%**	**14.46%**	**12.65%**	**12.96%**	**10.26%**	**9.67%**	**9.46%**	**9.36%**	**8.88%**	**5.63%**	**6.03%**	-
United Kingdom	12.71%	13.56%	13.12%	10.24%	11.42%	11.65%	13.03%	13.10%	14.99%	13.86%	12.16%	10.95%	11.93%	10.84%	10.93%	9.91%	10.69%	11.39%	10.47%	7.31%	-	-	-	-
EU28 (median)	**14.04%**	**13.90%**	**13.41%**	**13.22%**	**11.59%**	**11.34%**	**10.74%**	**10.84%**	**14.53%**	**16.15%**	**12.45%**	**13.81%**	**14.70%**	**14.37%**	**12.40%**	**12.91%**	**10.48%**	**9.95%**	**9.84%**	**8.96%**	-	-	-	-

Source: own calculations, download underlying data.

Table 117: VAT policy gap (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*35 322*	*36 047*	37 411	39 023	39 410	42 026	47 633
BG	*2 044*	*2 224*	2 498	2 615	2 838	3 386	3 885
CZ	*9 429*	*10 252*	11 822	12 943	13 181	14 789	16 521
DK	*20 420*	*21 133*	21 450	21 855	22 317	23 505	23 670
DE	*192 064*	*199 329*	204 523	213 129	219 928	231 650	246 346
EE	*1 095*	*1 212*	1 232	1 351	1 394	1 561	1 754
IE	*17 788*	*15 764*	16 984	17 209	17 030	18 984	22 408
EL	*19 252*	*19 538*	19 745	21 118	20 552	22 499	25 362
ES	*105 685*	*109 854*	113 564	116 145	108 282	115 784	129 385
FR	*192 401*	*198 138*	202 274	205 656	206 607	213 394	225 847
HR	*3 603*	*3 542*	3 657	4 659	4 228	4 784	5 674
IT	*155 639*	*164 837*	169 773	167 049	158 869	173 733	191 559
CY	*1 248*	*1 258*	1 515	1 559	1 436	1 751	1 978
LV	*1 730*	*1 740*	1 917	2 005	1 971	2 165	2 272
LT	*1 993*	*2 032*	2 240	2 401	2 445	2 696	3 281
LU	*2 062*	*2 382*	2 357	2 663	2 389	2 867	3 059
HU	*9 630*	*11 198*	12 147	13 250	12 894	13 815	15 338
MT	*443*	*455*	482	524	440	446	492
NL	*55 610*	*56 808*	60 943	60 343	59 672	64 443	72 411
AT	*24 152*	*26 203*	26 777	27 844	28 072	30 716	32 453
PL	*36 546*	*37 700*	39 300	42 265	42 760	47 413	64 611
PT	*18 458*	*19 717*	20 515	21 348	20 747	21 755	24 911
RO	*8 152*	*9 531*	11 160	12 146	13 358	14 226	16 768
SI	*3 115*	*3 327*	3 478	3 690	3 724	4 106	4 648
SK	*5 225*	*5 544*	5 944	6 214	6 566	7 012	8 101
FI	*20 962*	*21 617*	22 393	22 866	22 900	23 467	24 562
SE	*37 474*	*38 545*	38 069	37 852	38 279	40 538	39 891
UK	*214 742*	*204 839*	209 664	222 069			
EU28	***1 196 283***	***1 224 767***	**1 263 833**	**1 301 792**			
EU27	***981 541***	***1 019 928***	**1 054 168**	**1 079 723**	**1 072 293**	**1 143 511**	**1 254 822**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 118: VAT policy gap (% of notional ideal revenue)

	2016	2017	2018	2019	2020	2021	2022
BE	*52.6%*	*52.0%*	51.4%	51.7%	54.0%	53.3%	54.0%
BG	*28.5%*	*29.9%*	30.7%	29.5%	32.1%	32.8%	31.5%
CZ	*37.1%*	*37.4%*	38.9%	39.8%	42.1%	43.3%	42.0%
DK	*41.0%*	*41.2%*	40.1%	40.1%	40.7%	39.9%	37.8%
DE	*44.2%*	*44.5%*	44.2%	44.4%	48.3%	46.0%	45.2%
EE	*33.9%*	*34.4%*	33.3%	34.0%	34.9%	35.1%	33.6%
IE	*59.2%*	*50.0%*	52.8%	51.4%	52.6%	53.3%	53.8%
EL	*51.2%*	*48.8%*	49.1%	51.1%	55.5%	55.1%	54.0%
ES	*58.2%*	*57.8%*	57.8%	57.4%	59.4%	57.4%	57.2%
FR	*53.4%*	*53.6%*	52.6%	52.0%	54.0%	52.0%	51.6%
HR	*35.7%*	*33.9%*	33.1%	38.7%	37.5%	35.8%	35.9%
IT	*52.1%*	*54.0%*	54.9%	54.3%	55.8%	56.1%	55.3%
CY	*39.2%*	*37.1%*	40.4%	39.9%	40.2%	43.0%	42.4%
LV	*41.7%*	*27.3%*	40.4%	40.5%	40.5%	40.3%	37.2%
LT	*30.9%*	*29.7%*	32.6%	33.0%	32.7%	32.6%	33.2%
LU	*40.1%*	*43.8%*	38.0%	40.6%	36.8%	38.8%	38.1%
HU	*43.7%*	*45.4%*	45.7%	45.8%	46.9%	46.4%	46.7%
MT	*31.9%*	*30.2%*	28.7%	28.9%	27.5%	24.9%	23.4%
NL	*52.4%*	*51.8%*	50.8%	48.0%	48.0%	48.3%	48.8%
AT	*45.4%*	*47.5%*	45.6%	46.1%	48.4%	49.4%	47.0%
PL	*49.2%*	*46.8%*	45.5%	46.2%	47.4%	47.6%	55.4%
PT	*51.2%*	*52.1%*	51.0%	51.0%	53.4%	52.1%	52.0%
RO	*32.4%*	*34.6%*	36.8%	36.5%	38.9%	37.4%	37.7%
SI	*47.0%*	*48.3%*	46.9%	46.8%	49.8%	48.0%	47.5%
SK	*43.1%*	*43.6%*	44.0%	43.2%	45.1%	45.1%	44.7%
FI	*50.7%*	*51.4%*	50.2%	49.8%	50.2%	49.2%	48.2%
SE	*45.9%*	*45.9%*	46.1%	45.8%	45.7%	43.8%	42.0%
UK	*53.1%*	*52.5%*	43.8%	45.1%			
EU28 (median)	***44.8%***	***45.6%***	**44.8%**	**45.4%**			
EU27 (median)	***44.2%***	***45.4%***	**45.5%**	**45.8%**	**46.9%**	**46.0%**	**45.2%**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 119: VAT exemption gap (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*27 473*	*28 057*	29 068	30 198	30 623	32 530	36 081
BG	*1 794*	*1 960*	2 216	2 306	2 636	3 075	3 371
CZ	*7 994*	*8 695*	10 101	10 932	11 305	12 367	13 475
DK	*20 042*	*20 746*	21 025	21 427	22 058	23 250	23 310
DE	*162 031*	*168 612*	172 706	180 723	183 127	196 183	205 711
EE	*1 007*	*1 119*	1 132	1 241	1 301	1 457	1 617
IE	*14 286*	*12 090*	11 665	12 460	13 412	14 644	16 525
EL	*15 652*	*15 449*	15 150	15 339	15 298	16 127	16 650
ES	*79 898*	*82 156*	84 494	85 476	83 841	86 232	93 589
FR	*145 629*	*149 688*	152 366	152 735	157 787	165 604	172 949
HR	*2 630*	*2 608*	2 650	3 193	3 045	3 266	3 557
IT	*112 578*	*113 563*	117 420	115 051	114 214	125 549	135 262
CY	*756*	*465*	795	829	853	1 051	1 057
LV	*1 595*	*1 598*	1 735	1 816	1 813	1 970	1 980
LT	*1 798*	*1 850*	2 036	2 167	2 250	2 468	2 835
LU	*1 186*	*1 304*	1 232	1 475	1 247	1 563	1 540
HU	*8 611*	*9 662*	10 074	10 997	10 586	11 504	12 595
MT	*197*	*186*	190	236	201	183	163
NL	*43 710*	*44 365*	46 895	48 446	49 061	53 036	57 912
AT	*18 430*	*20 284*	17 803	18 355	18 076	19 371	20 291
PL	*25 590*	*25 671*	26 771	28 861	29 516	32 042	38 113
PT	*13 526*	*14 093*	14 624	15 141	15 411	15 722	17 247
RO	*5 855*	*6 874*	7 443	8 150	9 310	9 743	11 432
SI	*2 343*	*2 497*	2 613	2 773	2 898	3 204	3 551
SK	*4 918*	*4 883*	5 217	5 439	5 778	6 067	7 038
FI	*16 814*	*17 474*	18 126	18 431	18 725	19 088	19 697
SE	*30 880*	*31 712*	31 390	31 086	31 938	33 900	32 608
UK	*178 841*	*170 669*	174 410	185 775			
EU28	***946 064***	***958 329***	**981 345**	**1 011 060**			
EU27	***767 223***	***787 661***	**806 934**	**825 285**	**836 306**	**891 197**	**950 155**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 120: VAT exemption gap (% of notional ideal revenue)

	2016	2017	2018	2019	2020	2021	2022
BE	*40.9%*	*40.4%*	39.9%	40.0%	41.9%	41.3%	40.9%
BG	*25.0%*	*26.4%*	27.3%	26.0%	29.8%	29.8%	27.4%
CZ	*31.5%*	*31.7%*	33.2%	33.6%	36.1%	36.2%	34.2%
DK	*40.3%*	*40.5%*	39.3%	39.3%	40.3%	39.5%	37.2%
DE	*37.3%*	*37.7%*	37.3%	37.7%	40.2%	39.0%	37.8%
EE	*31.2%*	*31.8%*	30.6%	31.2%	32.6%	32.7%	31.0%
IE	*47.6%*	*38.4%*	36.3%	37.2%	41.5%	41.1%	39.7%
EL	*41.6%*	*38.6%*	37.6%	37.1%	41.3%	39.5%	35.5%
ES	*44.0%*	*43.3%*	43.0%	42.3%	46.0%	42.8%	41.4%
FR	*40.4%*	*40.5%*	39.6%	38.6%	41.2%	40.3%	39.5%
HR	*26.0%*	*25.0%*	24.0%	26.5%	27.0%	24.4%	22.5%
IT	*37.7%*	*37.2%*	38.0%	37.4%	40.1%	40.6%	39.0%
CY	*23.7%*	*13.7%*	21.2%	21.2%	23.9%	25.8%	22.6%
LV	*38.5%*	*25.1%*	36.6%	36.7%	37.2%	36.7%	32.4%
LT	*27.9%*	*27.1%*	29.6%	29.8%	30.1%	29.9%	28.7%
LU	*23.0%*	*24.0%*	19.9%	22.5%	19.2%	21.2%	19.2%
HU	*39.1%*	*39.1%*	37.9%	38.0%	38.5%	38.6%	38.3%
MT	*14.2%*	*12.4%*	11.3%	13.1%	12.5%	10.2%	7.8%
NL	*41.2%*	*40.5%*	39.1%	38.5%	39.4%	39.7%	39.0%
AT	*34.7%*	*36.7%*	30.3%	30.4%	31.2%	31.1%	29.4%
PL	*34.5%*	*31.9%*	31.0%	31.5%	32.8%	32.1%	32.7%
PT	*37.5%*	*37.2%*	36.3%	36.1%	39.7%	37.7%	36.0%
RO	*23.3%*	*25.0%*	24.5%	24.5%	27.1%	25.6%	25.7%
SI	*35.4%*	*36.2%*	35.2%	35.2%	38.8%	37.4%	36.3%
SK	*40.6%*	*38.4%*	38.7%	37.8%	39.7%	39.0%	38.8%
FI	*40.7%*	*41.6%*	40.6%	40.1%	41.0%	40.0%	38.6%
SE	*37.8%*	*37.8%*	38.0%	37.6%	38.1%	36.6%	34.4%
UK	*44.2%*	*43.7%*	43.8%	45.1%			
EU28 (median)	***37.6%***	***37.2%***	**36.5%**	**36.9%**			
EU27 (median)	***37.5%***	***37.2%***	**36.3%**	**36.7%**	**38.5%**	**37.4%**	**35.5%**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 121: Actionable VAT exemption gap (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*2 438*	*2 195*	2 353	2 638	2 604	2 386	3 068
BG	*17*	*- 118*	- 39	- 16	130	161	159
CZ	*1 223*	*1 306*	1 932	2 142	1 963	2 090	2 416
DK	*1 693*	*1 764*	1 685	1 652	1 734	1 578	1 347
DE	*28 552*	*29 571*	29 955	32 577	35 272	31 252	34 205
EE	*223*	*299*	292	288	302	380	420
IE	*1 752*	*1 255*	531	1 183	1 538	1 306	1 191
EL	*4 207*	*4 603*	4 038	3 940	3 793	4 422	4 572
ES	*23 565*	*25 552*	25 811	25 629	23 090	24 831	30 437
FR	*20 567*	*19 662*	20 718	20 439	20 993	23 199	26 710
HR	*260*	*134*	267	599	612	679	701
IT	*24 030*	*22 530*	23 874	23 869	22 185	30 624	34 825
CY	*215*	*0*	196	171	137	178	96
LV	*377*	*648*	802	736	701	689	591
LT	*568*	*588*	653	630	665	516	627
LU	*252*	*259*	181	287	228	292	176
HU	*1 493*	*2 069*	2 445	2 749	2 548	2 674	2 494
MT	*- 83*	*- 96*	- 114	- 128	- 206	- 251	- 279
NL	*1 915*	*2 068*	2 105	1 623	1 095	3 199	6 307
AT	*2 911*	*3 601*	843	781	130	- 53	222
PL	*8 218*	*8 098*	9 353	10 015	9 672	9 870	12 387
PT	*2 235*	*2 246*	2 334	2 314	2 421	2 312	2 924
RO	*801*	*1 224*	1 247	1 404	2 288	2 495	2 775
SI	*488*	*511*	575	624	596	709	960
SK	*1 255*	*1 283*	1 474	1 463	1 340	1 304	1 678
FI	*2 215*	*2 475*	2 616	2 843	2 645	2 055	2 359
SE	*2 608*	*2 968*	3 561	3 609	3 299	3 316	2 908
UK	*34 296*	*33 262*	34 905	38 451			
EU28	***168 292***	***169 957***	**174 594**	**182 514**			
EU27	***133 996***	***136 695***	**139 689**	**144 063**	**141 774**	**152 213**	**176 280**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 122: Actionable VAT exemption gap (% of notional ideal revenue)

	2016	2017	2018	2019	2020	2021	2022
BE	*3.6%*	*3.2%*	3.3%	3.5%	3.6%	3.1%	3.5%
BG	*0.2%*	*-1.6%*	-0.5%	-0.2%	1.5%	1.6%	1.3%
CZ	*4.8%*	*4.8%*	6.3%	6.5%	6.2%	6.1%	6.1%
DK	*3.4%*	*3.4%*	3.2%	3.1%	3.2%	2.7%	2.2%
DE	*6.6%*	*6.6%*	6.5%	6.8%	7.7%	6.2%	6.3%
EE	*6.9%*	*8.5%*	7.8%	7.2%	7.5%	8.5%	8.0%
IE	*5.8%*	*4.0%*	1.7%	3.5%	4.8%	3.7%	2.9%
EL	*11.2%*	*11.5%*	10.1%	9.6%	10.4%	10.9%	9.8%
ES	*13.0%*	*13.5%*	13.1%	12.7%	12.7%	12.3%	13.5%
FR	*5.7%*	*5.3%*	5.5%	5.3%	5.6%	5.7%	6.2%
HR	*2.6%*	*1.3%*	2.4%	4.9%	5.4%	5.1%	4.4%
IT	*8.0%*	*7.4%*	7.7%	7.6%	7.7%	9.7%	9.9%
CY	*6.8%*	*0.0%*	5.3%	4.4%	3.9%	4.4%	2.1%
LV	*9.1%*	*10.2%*	11.6%	10.2%	9.9%	8.8%	6.7%
LT	*8.8%*	*8.6%*	8.9%	8.1%	8.3%	5.9%	6.0%
LU	*4.9%*	*4.8%*	3.2%	4.8%	3.8%	4.4%	2.4%
HU	*6.8%*	*8.4%*	9.2%	9.5%	9.2%	9.0%	7.6%
MT	*-6.0%*	*-6.4%*	-6.8%	-7.0%	-12.8%	-14.0%	-13.3%
NL	*1.8%*	*1.9%*	1.8%	1.3%	0.9%	2.4%	4.3%
AT	*5.5%*	*6.5%*	1.5%	1.3%	0.2%	-0.1%	0.3%
PL	*11.1%*	*10.1%*	10.9%	11.0%	10.8%	10.0%	10.7%
PT	*6.2%*	*5.9%*	5.9%	5.6%	6.3%	5.6%	6.2%
RO	*3.2%*	*4.4%*	4.1%	4.2%	6.7%	6.6%	6.3%
SI	*7.4%*	*7.4%*	7.8%	8.0%	8.0%	8.4%	9.9%
SK	*10.4%*	*10.1%*	10.9%	10.1%	9.1%	8.3%	9.2%
FI	*5.4%*	*5.9%*	6.0%	6.4%	6.0%	4.4%	4.7%
SE	*3.2%*	*3.5%*	4.3%	4.4%	3.9%	3.6%	3.1%
UK	*8.5%*	*8.5%*	8.7%	9.3%			
EU28 (median)	***6.0%***	***5.9%***	**5.9%**	**6.0%**			
EU27 (median)	***5.8%***	***5.9%***	**5.9%**	**5.6%**	**6.2%**	**5.7%**	**6.1%**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.
Source: own calculations, download underlying data.

Table 123: VAT rate gap (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*7 849*	*7 990*	8 342	8 825	8 787	9 496	11 552
BG	*250*	*264*	282	309	202	310	514
CZ	*1 434*	*1 557*	1 721	2 011	1 876	2 422	3 046
DK	*378*	*388*	425	429	260	255	361
DE	*30 033*	*30 717*	31 817	32 406	36 801	35 466	40 635
EE	*88*	*93*	100	110	93	104	137
IE	*3 502*	*3 675*	5 319	4 749	3 619	4 340	5 884
EL	*3 599*	*4 089*	4 595	5 779	5 254	6 371	8 712
ES	*25 787*	*27 697*	29 070	30 669	24 441	29 552	35 795
FR	*46 772*	*48 449*	49 909	52 921	48 821	47 790	52 898
HR	*973*	*934*	1 007	1 465	1 183	1 519	2 116
IT	*43 061*	*51 274*	52 354	51 997	44 656	48 184	56 297
CY	*493*	*793*	720	730	583	700	922
LV	*135*	*142*	182	189	159	194	292
LT	*195*	*182*	204	234	196	228	446
LU	*876*	*1 078*	1 126	1 188	1 142	1 304	1 519
HU	*1 019*	*1 536*	2 073	2 253	2 308	2 311	2 743
MT	*246*	*269*	292	287	240	263	329
NL	*11 900*	*12 443*	14 048	11 897	10 610	11 407	14 499
AT	*5 722*	*5 919*	8 974	9 490	9 996	11 345	12 162
PL	*10 956*	*12 029*	12 529	13 404	13 245	15 370	26 498
PT	*4 932*	*5 624*	5 890	6 207	5 336	6 033	7 664
RO	*2 297*	*2 658*	3 716	3 995	4 049	4 483	5 336
SI	*772*	*830*	866	917	826	902	1 097
SK	*307*	*661*	728	775	788	945	1 063
FI	*4 148*	*4 143*	4 267	4 435	4 175	4 379	4 865
SE	*6 595*	*6 833*	6 679	6 766	6 341	6 638	7 284
UK	*35 901*	*34 170*	35 254	36 294			
EU28	***250 219***	***266 437***	**282 488**	**290 732**			
EU27	***214 318***	***232 267***	**247 234**	**254 438**	**235 987**	**252 314**	**304 666**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 124: VAT rate gap (% of notional ideal revenue)

	2016	2017	2018	2019	2020	2021	2022
BE	*11.7%*	*11.5%*	11.5%	11.7%	12.0%	12.0%	13.1%
BG	*3.5%*	*3.5%*	3.5%	3.5%	2.3%	3.0%	4.2%
CZ	*5.6%*	*5.7%*	5.7%	6.2%	6.0%	7.1%	7.7%
DK	*0.8%*	*0.8%*	0.8%	0.8%	0.5%	0.4%	0.6%
DE	*6.9%*	*6.9%*	6.9%	6.8%	8.1%	7.0%	7.5%
EE	*2.7%*	*2.6%*	2.7%	2.8%	2.3%	2.3%	2.6%
IE	*11.7%*	*11.7%*	16.5%	14.2%	11.2%	12.2%	14.1%
EL	*9.6%*	*10.2%*	11.4%	14.0%	14.2%	15.6%	18.6%
ES	*14.2%*	*14.6%*	14.8%	15.2%	13.4%	14.7%	15.8%
FR	*13.0%*	*13.1%*	13.0%	13.4%	12.8%	11.6%	12.1%
HR	*9.6%*	*8.9%*	9.1%	12.2%	10.5%	11.4%	13.4%
IT	*14.4%*	*16.8%*	16.9%	16.9%	15.7%	15.6%	16.3%
CY	*15.5%*	*23.4%*	19.2%	18.7%	16.3%	17.2%	19.8%
LV	*3.3%*	*2.2%*	3.8%	3.8%	3.3%	3.6%	4.8%
LT	*3.0%*	*2.7%*	3.0%	3.2%	2.6%	2.8%	4.5%
LU	*17.0%*	*19.8%*	18.2%	18.1%	17.6%	17.7%	18.9%
HU	*4.6%*	*6.2%*	7.8%	7.8%	8.4%	7.8%	8.4%
MT	*17.7%*	*17.9%*	17.4%	15.9%	15.0%	14.7%	15.7%
NL	*11.2%*	*11.4%*	11.7%	9.5%	8.5%	8.5%	9.8%
AT	*10.8%*	*10.7%*	15.3%	15.7%	17.3%	18.2%	17.6%
PL	*14.7%*	*14.9%*	14.5%	14.7%	14.7%	15.4%	22.7%
PT	*13.7%*	*14.9%*	14.6%	14.8%	13.7%	14.5%	16.0%
RO	*9.1%*	*9.6%*	12.2%	12.0%	11.8%	11.8%	12.0%
SI	*11.7%*	*12.0%*	11.7%	11.6%	11.0%	10.5%	11.2%
SK	*2.5%*	*5.2%*	5.4%	5.4%	5.4%	6.1%	5.9%
FI	*10.0%*	*9.9%*	9.6%	9.7%	9.2%	9.2%	9.5%
SE	*8.1%*	*8.1%*	8.1%	8.2%	7.6%	7.2%	7.7%
UK	*8.9%*	*8.8%*	8.8%	8.7%			
EU28 (median)	***9.8%***	***10.0%***	**11.4%**	**11.7%**			
EU27 (median)	***10.0%***	***10.2%***	**11.5%**	**11.7%**	**11.0%**	**11.4%**	**12.0%**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 125: Actionable VAT policy gap (EUR million)

	2016	2017	2018	2019	2020	2021	2022
BE	*10 294*	*10 206*	10 717	11 488	11 415	11 901	14 647
BG	*267*	*147*	243	293	332	472	673
CZ	*2 635*	*2 847*	3 634	4 133	3 818	4 489	5 438
DK	*2 061*	*2 169*	2 125	2 095	2 013	1 851	1 723
DE	*58 430*	*60 280*	61 764	64 975	72 064	66 710	74 831
EE	*310*	*391*	391	397	394	482	555
IE	*5 378*	*4 940*	5 854	5 937	5 163	5 652	7 080
EL	*7 934*	*8 733*	8 663	9 757	9 090	10 843	13 334
ES	*49 331*	*53 249*	54 881	56 298	47 531	54 383	66 232
FR	*67 186*	*68 415*	70 945	73 716	70 212	71 381	80 056
HR	*1 233*	*1 068*	1 274	2 062	1 796	2 197	2 818
IT	*66 495*	*73 707*	76 085	75 442	66 434	78 271	90 546
CY	*707*	*0*	918	903	722	880	1 020
LV	*515*	*587*	734	696	642	669	699
LT	*730*	*738*	818	824	817	713	1 040
LU	*1 150*	*1 361*	1 323	1 504	1 387	1 628	1 714
HU	*2 489*	*3 621*	4 526	4 998	4 852	4 981	5 229
MT	*162*	*173*	179	160	35	13	50
NL	*13 812*	*14 514*	16 153	13 520	11 706	14 606	20 806
AT	*8 611*	*9 630*	9 841	10 293	10 130	11 291	12 389
PL	*19 261*	*20 205*	21 965	23 503	23 005	25 330	39 034
PT	*7 169*	*7 901*	8 259	8 547	7 780	8 367	10 615
RO	*3 098*	*3 881*	4 959	5 403	6 350	6 991	8 128
SI	*1 253*	*1 345*	1 446	1 547	1 426	1 617	2 064
SK	*1 548*	*1 937*	2 193	2 230	2 119	2 240	2 730
FI	*6 346*	*6 685*	6 944	7 354	6 890	6 487	7 285
SE	*9 188*	*9 806*	10 247	10 381	9 646	9 959	10 197
UK	*70 021*	*67 270*	69 980	74 438			
EU28	***417 613***	***435 806***	**457 060**	**472 893**			
EU27	***347 593***	***368 537***	**387 080**	**398 456**	**377 767**	**404 404**	**480 934**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

Table 126: Actionable VAT policy gap (% of notional ideal revenue)

	2016	2017	2018	2019	2020	2021	2022
BE	*15.3%*	*14.7%*	14.7%	15.2%	15.6%	15.1%	16.6%
BG	*3.7%*	*2.0%*	3.0%	3.3%	3.8%	4.6%	5.5%
CZ	*10.4%*	*10.4%*	12.0%	12.7%	12.2%	13.1%	13.8%
DK	*4.1%*	*4.2%*	4.0%	3.8%	3.7%	3.1%	2.8%
DE	*13.4%*	*13.5%*	13.3%	13.5%	15.8%	13.3%	13.7%
EE	*9.6%*	*11.1%*	10.6%	10.0%	9.9%	10.8%	10.6%
IE	*17.9%*	*15.7%*	18.2%	17.7%	16.0%	15.9%	17.0%
EL	*21.1%*	*21.8%*	21.5%	23.6%	24.6%	26.5%	28.4%
ES	*27.2%*	*28.0%*	27.9%	27.8%	26.1%	27.0%	29.3%
FR	*18.6%*	*18.5%*	18.4%	18.6%	18.3%	17.4%	18.3%
HR	*12.2%*	*10.2%*	11.5%	17.1%	15.9%	16.4%	17.9%
IT	*22.2%*	*24.2%*	24.6%	24.5%	23.3%	25.3%	26.1%
CY	*22.2%*	*0.0%*	24.5%	23.1%	20.2%	21.6%	21.9%
LV	*12.4%*	*9.2%*	15.5%	14.1%	13.2%	12.5%	11.5%
LT	*11.3%*	*10.8%*	11.9%	11.3%	10.9%	8.6%	10.5%
LU	*22.3%*	*25.0%*	21.3%	23.0%	21.4%	22.1%	21.4%
HU	*11.3%*	*14.7%*	17.0%	17.3%	17.6%	16.7%	15.9%
MT	*11.7%*	*11.5%*	10.6%	8.8%	2.2%	0.7%	2.4%
NL	*13.0%*	*13.2%*	13.5%	10.8%	9.4%	10.9%	14.0%
AT	*16.2%*	*17.4%*	16.8%	17.0%	17.5%	18.2%	17.9%
PL	*25.9%*	*25.1%*	25.4%	25.7%	25.5%	25.4%	33.5%
PT	*19.9%*	*20.9%*	20.5%	20.4%	20.0%	20.0%	22.2%
RO	*12.3%*	*14.1%*	16.3%	16.2%	18.5%	18.4%	18.3%
SI	*18.9%*	*19.5%*	19.5%	19.6%	19.1%	18.9%	21.1%
SK	*12.8%*	*15.2%*	16.3%	15.5%	14.6%	14.4%	15.1%
FI	*15.4%*	*15.9%*	15.6%	16.0%	15.1%	13.6%	14.3%
SE	*11.3%*	*11.7%*	12.4%	12.6%	11.5%	10.8%	10.7%
UK	*17.3%*	*17.2%*	17.6%	18.1%			
EU28 (median)	***14.4%***	***14.7%***	**16.3%**	**16.6%**			
EU27 (median)	***13.4%***	***14.7%***	**16.3%**	**16.2%**	**15.9%**	**15.9%**	**16.6%**

Note: figures for 2016 and 2017 come from earlier reports and have not been revised in this study.

Source: own calculations, download underlying data.

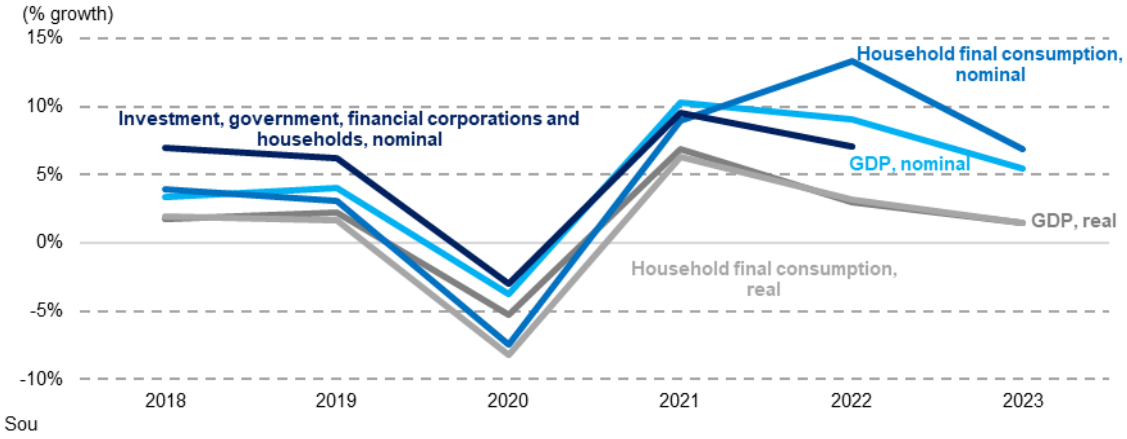
Table 127: Actionable standard VAT rate (%)

	2018	2019	2020	2021	2022
BE	15.1	15.0	14.7	14.7	14.5
BG	19.6	19.9	19.7	19.2	19.2
CZ	17.4	17.3	17.3	16.8	16.6
DK	23.2	23.2	23.3	23.4	23.9
DE	15.2	15.1	13.5	14.9	14.8
EE	18.5	18.4	18.6	18.2	18.1
IE	15.3	15.3	16.3	16.0	15.7
EL	17.9	17.1	16.3	15.9	15.5
ES	13.2	13.3	13.5	13.5	13.0
FR	14.8	14.8	14.8	15.1	14.9
HR	21.8	19.8	21.2	20.9	20.3
IT	14.7	14.7	14.7	14.1	14.0
CY	14.2	14.2	14.9	14.2	14.2
LV	17.7	17.7	18.1	18.3	18.1
LT	18.0	18.0	18.4	18.5	18.0
LU	13.5	12.8	13.6	13.1	13.2
HU	21.9	21.9	21.6	21.8	21.6
MT	15.7	16.1	17.3	17.6	17.3
NL	15.9	16.8	17.0	16.3	16.0
AT	15.7	15.5	15.1	14.8	15.0
PL	16.6	16.4	16.3	16.1	13.6
PT	16.2	16.1	15.9	15.9	15.4
RO	16.1	16.4	16.1	16.1	16.1
SI	16.6	16.6	16.5	16.7	16.5
SK	14.7	15.1	14.7	14.7	14.7
FI	18.0	18.3	18.6	18.9	19.0
SE	19.8	19.9	20.0	20.4	20.5
EU27	**16.9**	**16.9**	**17.0**	**16.9**	**16.7**

Source: own calculations, download underlying data.

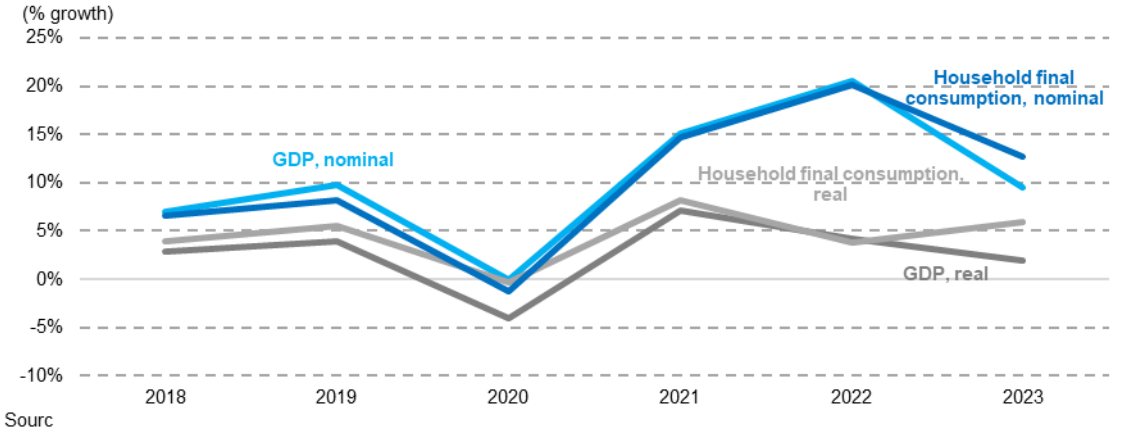
Annex F. Key macroeconomic drivers of economic growth across the EU27

Figure 120: BE: Growth in key macroeconomic drivers (% growth, 2018–2023)



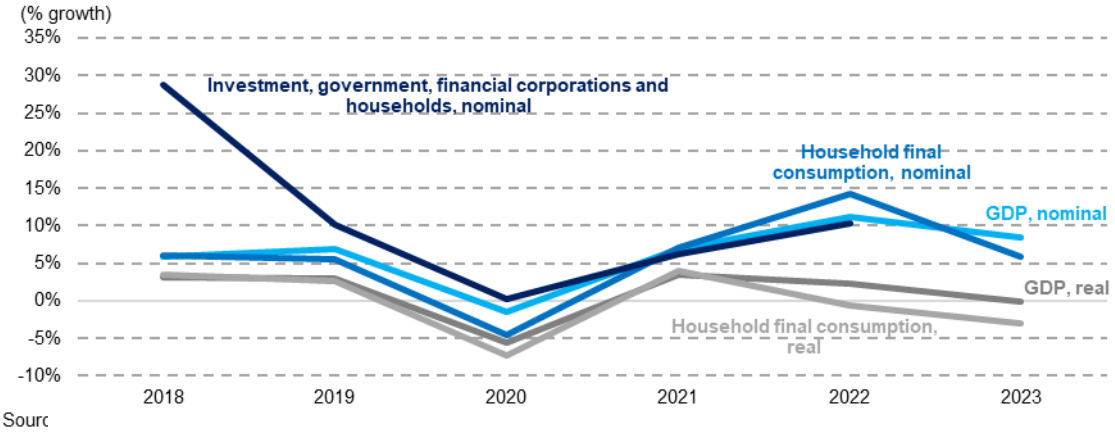
Source: own elaboration based on Eurostat.

Figure 121: BG: Growth in key macroeconomic drivers (% growth, 2018–2023)



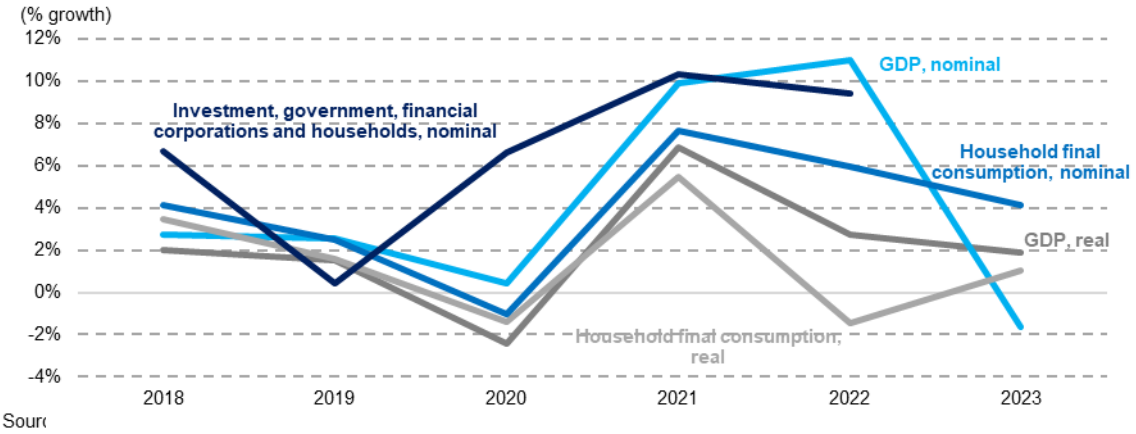
Source: own elaboration based on Eurostat

Figure 122: CZ: Growth in key macroeconomic drivers (% growth, 2018–2023)



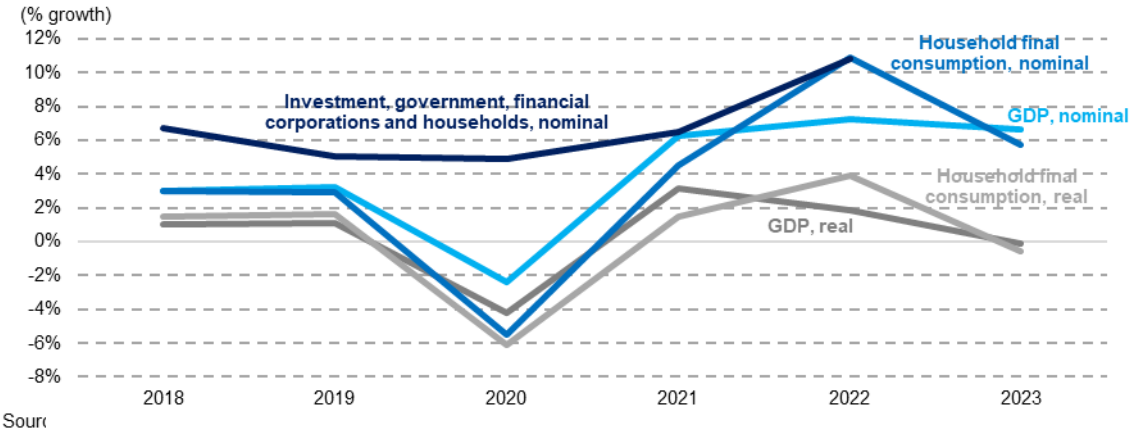
Source: own elaboration based on Eurostat.

Figure 123: DK: Growth in key macroeconomic drivers (% growth, 2018–2023)



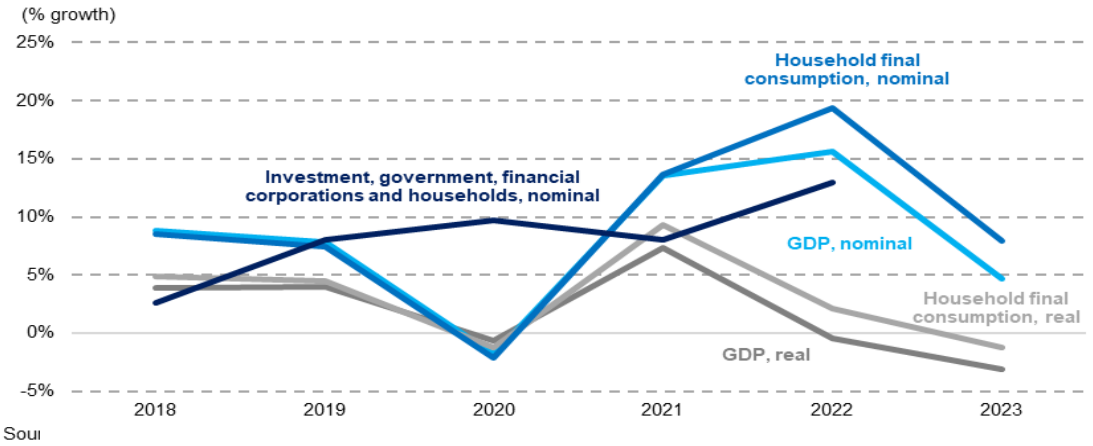
Source: own elaboration based on Eurostat.

Figure 124: DE: Growth in key macroeconomic drivers (% growth, 2018–2023)



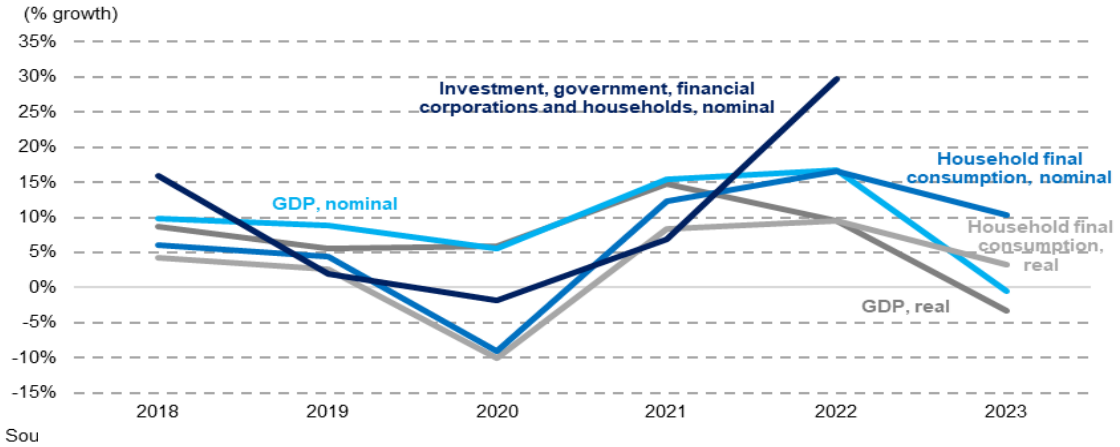
Source: own elaboration based on Eurostat.

Figure 125: EE: Growth in key macroeconomic drivers (% growth, 2018–2023)



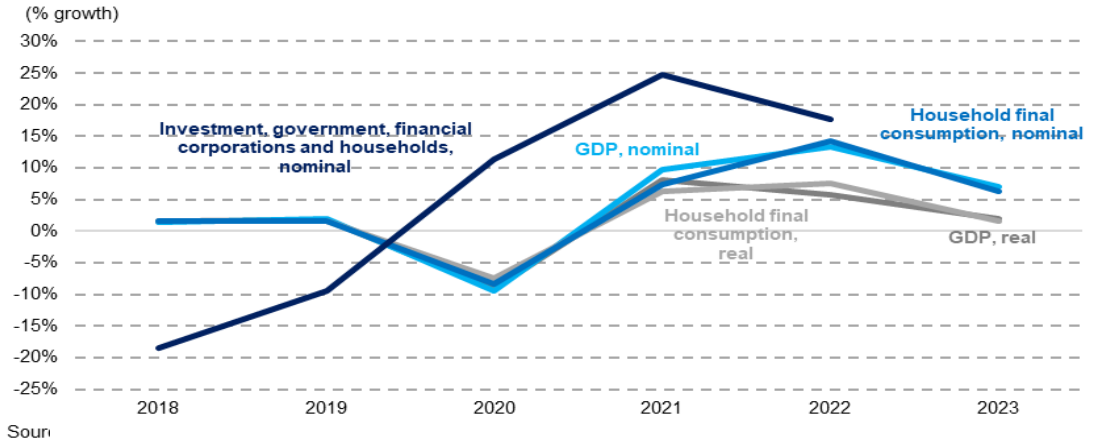
Source: own elaboration based on Eurostat.

Figure 126: IE: Growth in key macroeconomic drivers (% growth, 2018–2023)



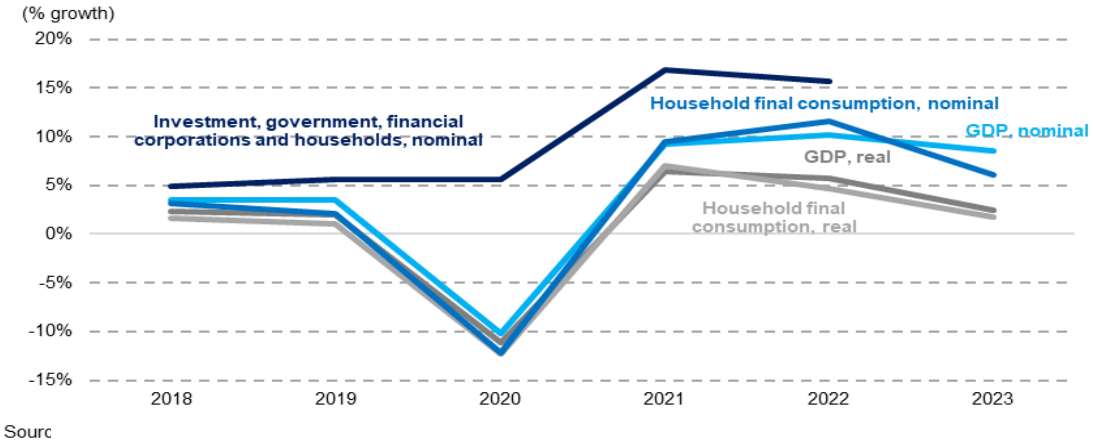
Source: own elaboration based on Eurostat.

Figure 127: EL: Growth in key macroeconomic drivers (% growth, 2018–2023)



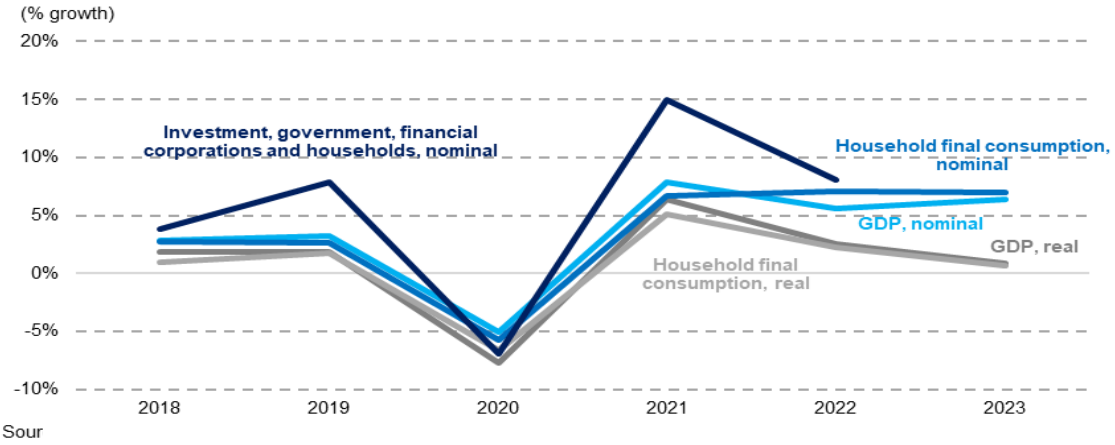
Source: own elaboration based on Eurostat.

Figure 128: ES: Growth in key macroeconomic drivers (% growth, 2018–2023)



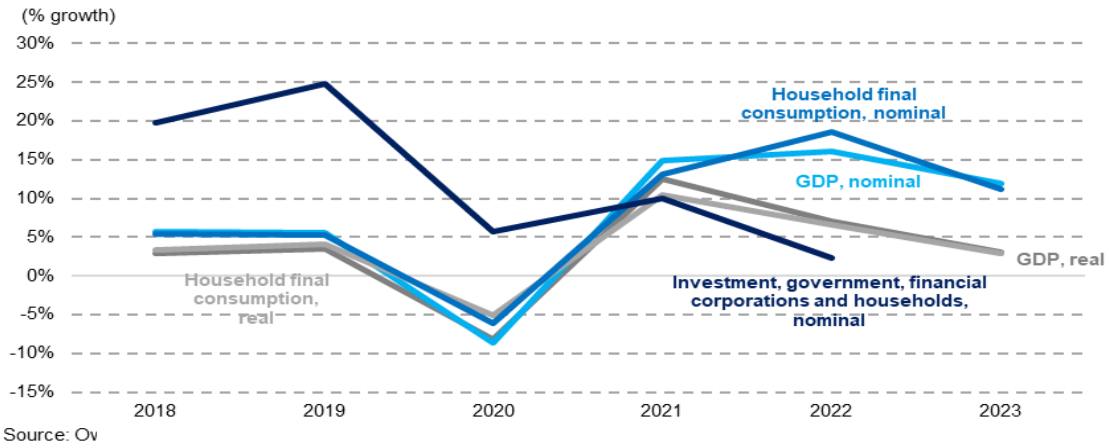
Source: own elaboration based on Eurostat.

Figure 129: FR: Growth in key macroeconomic drivers (%growth, 2018–2023)



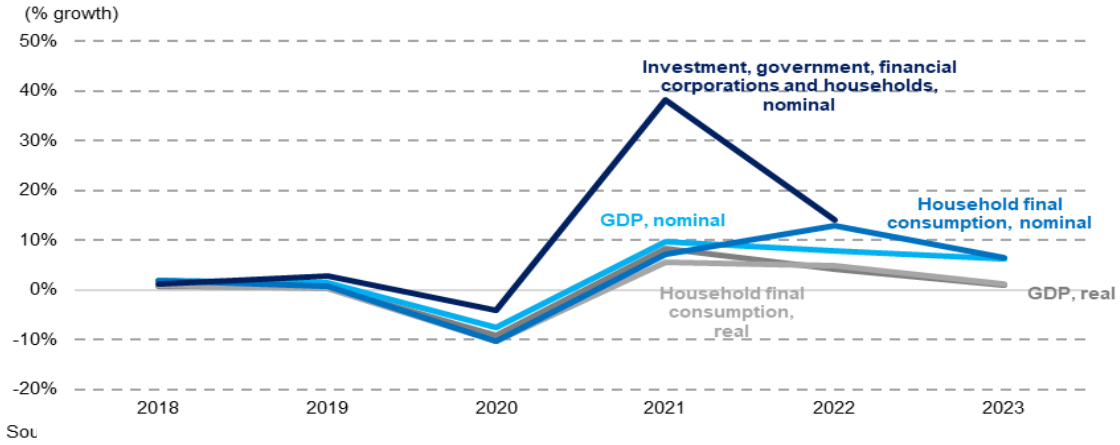
Source: own elaboration based on Eurostat.

Figure 130: HR: Growth in key macroeconomic drivers (% growth, 2018–2023)



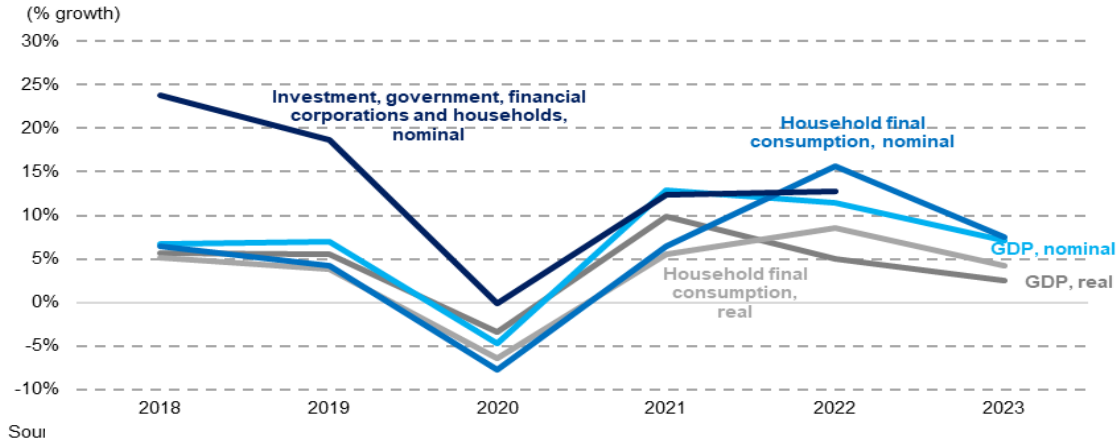
Source: own elaboration based on Eurostat.

Figure 131: IT: Growth in key macroeconomic drivers (% growth, 2018–2023)



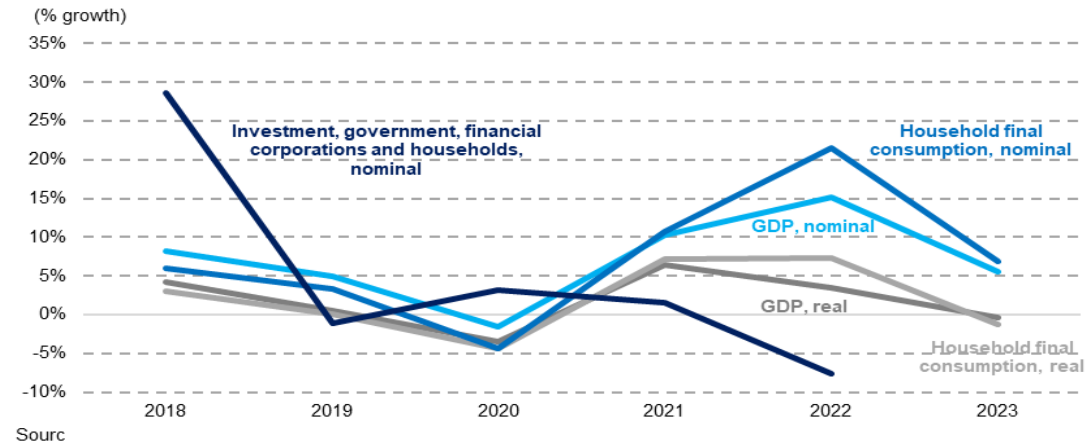
Source: own elaboration based on Eurostat.

Figure 132: CY: Growth in key macroeconomic drivers (% growth, 2018–2023)



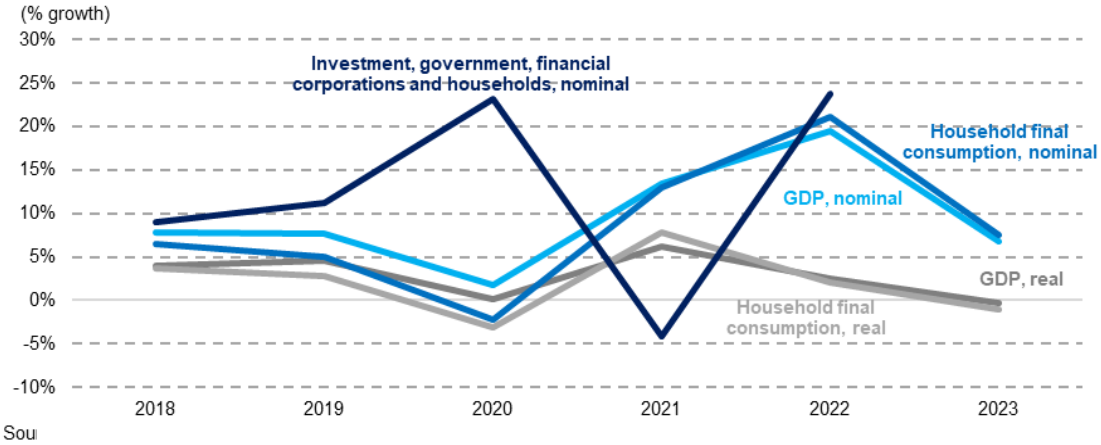
Source: own elaboration based on Eurostat.

Figure 133: LV: Growth in key macroeconomic drivers (% growth, 2018–2023)



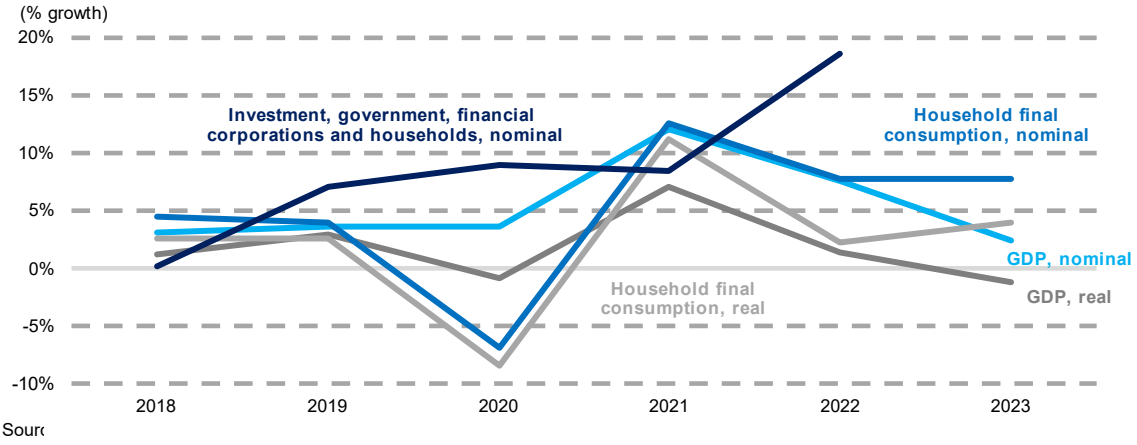
Source: own elaboration based on Eurostat.

Figure 134: LT: Growth in key macroeconomic drivers (%growth, 2018–2023)



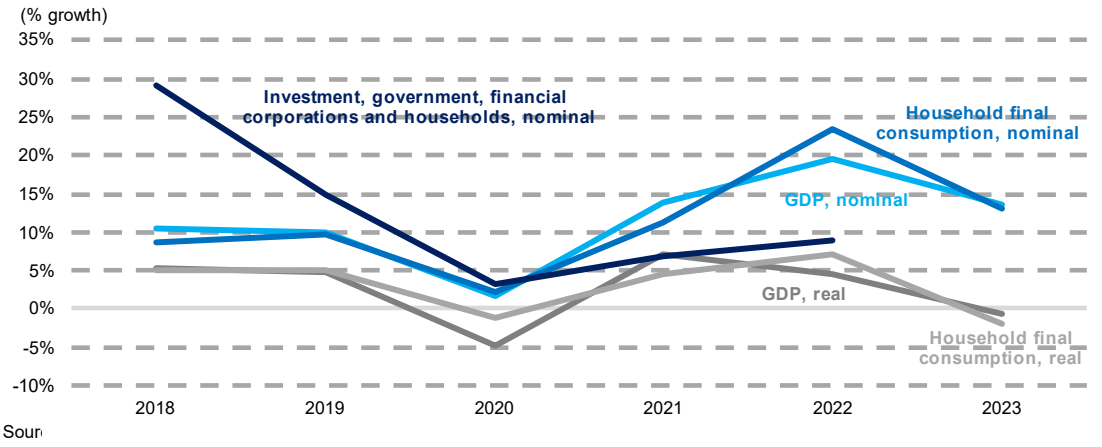
Source: own elaboration based on Eurostat.

Figure 135: LU: Growth in key macroeconomic drivers (% growth, 2018–2023)



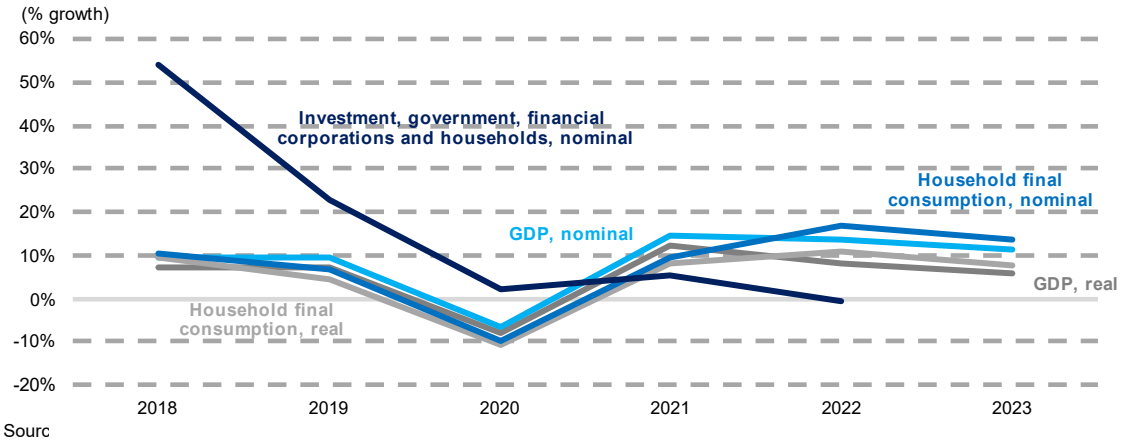
Source: own elaboration based on Eurostat.

Figure 136: HU: Growth in key macroeconomic drivers (% growth, 2018–2023)



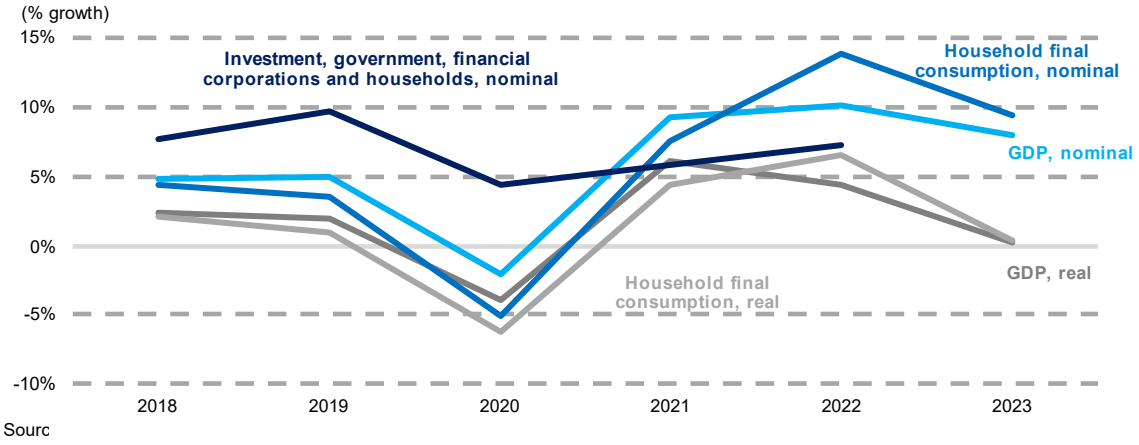
Source: own elaboration based on Eurostat.

Figure 137: MT: Growth in key macroeconomic drivers (% growth, 2018–2023)



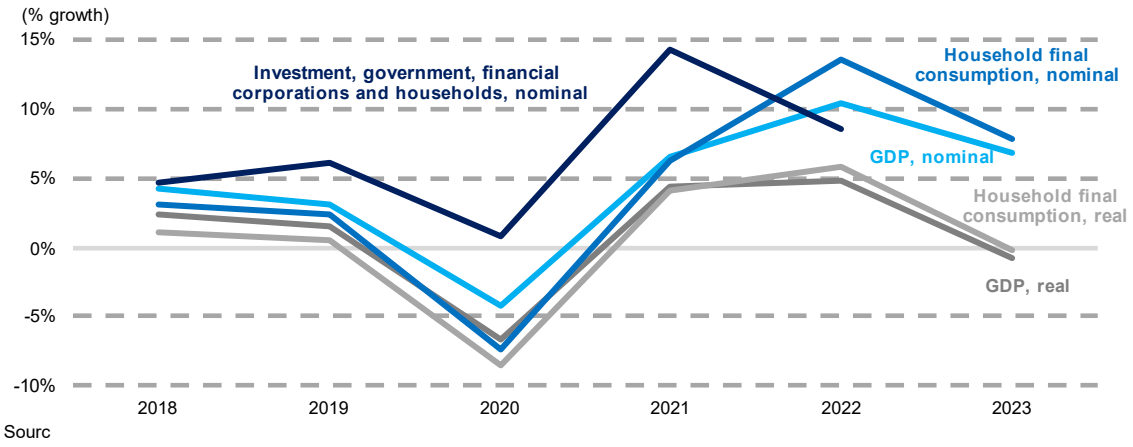
Source: own elaboration based on Eurostat.

Figure 138: NL: Growth in key macroeconomic drivers (% growth, 2018–2023)



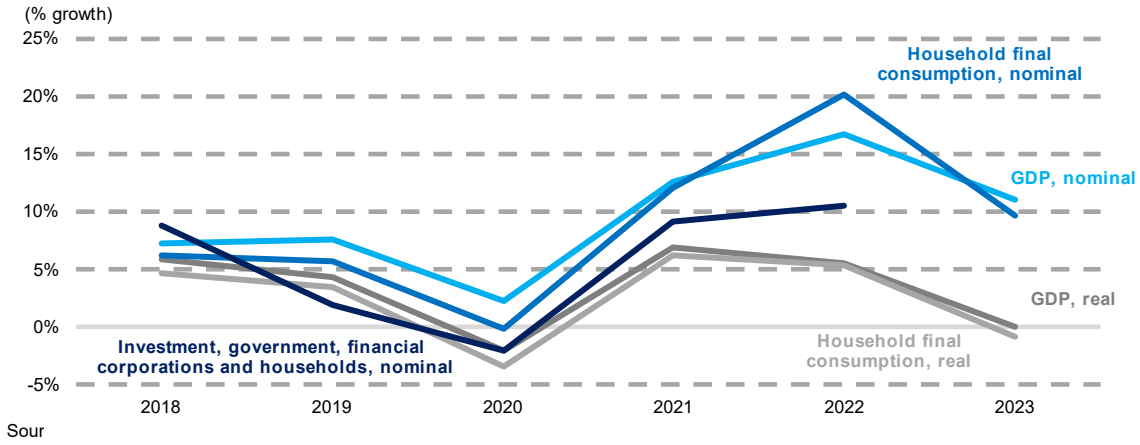
Source: own elaboration based on Eurostat.

Figure 139: AT: Growth in key macroeconomic drivers (% growth, 2018–2023)



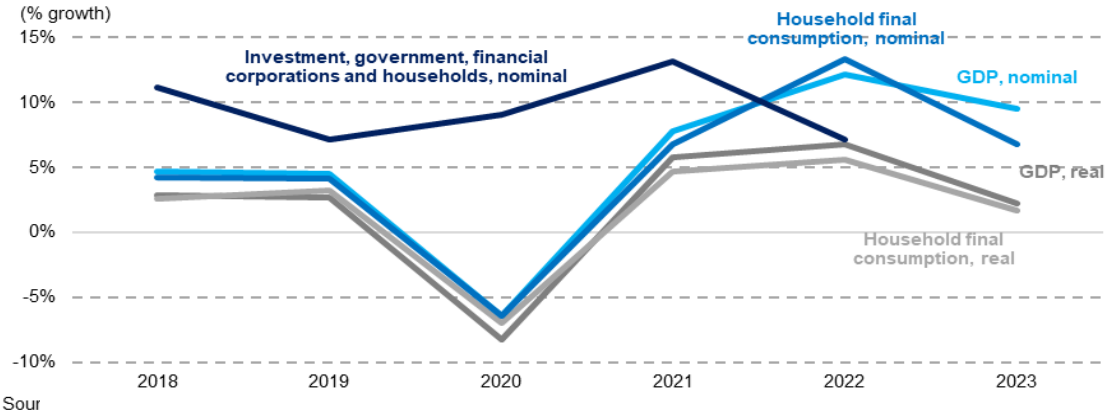
Source: own elaboration based on Eurostat.

Figure 140: PL: Growth in key macroeconomic drivers (% growth, 2018–2023)



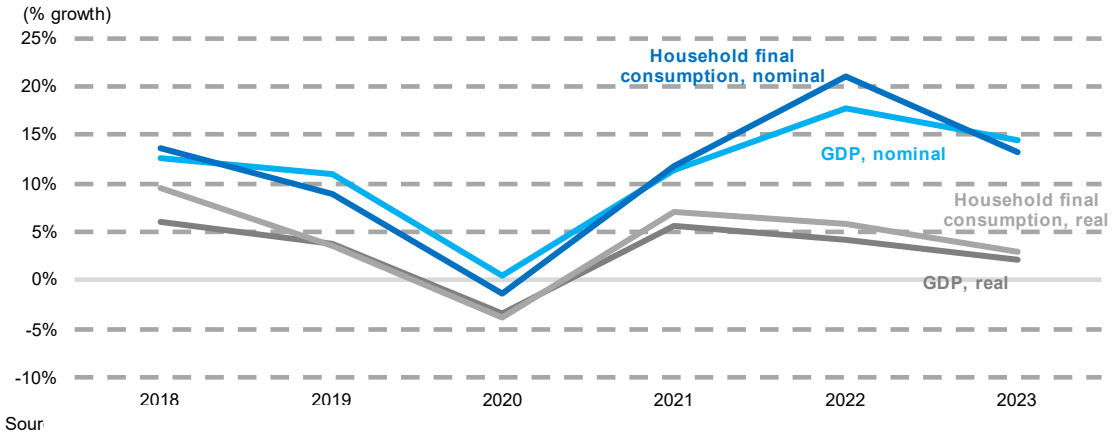
Source: own elaboration based on Eurostat.

Figure 141: PT: Growth in key macroeconomic drivers (% growth, 2018–2023)



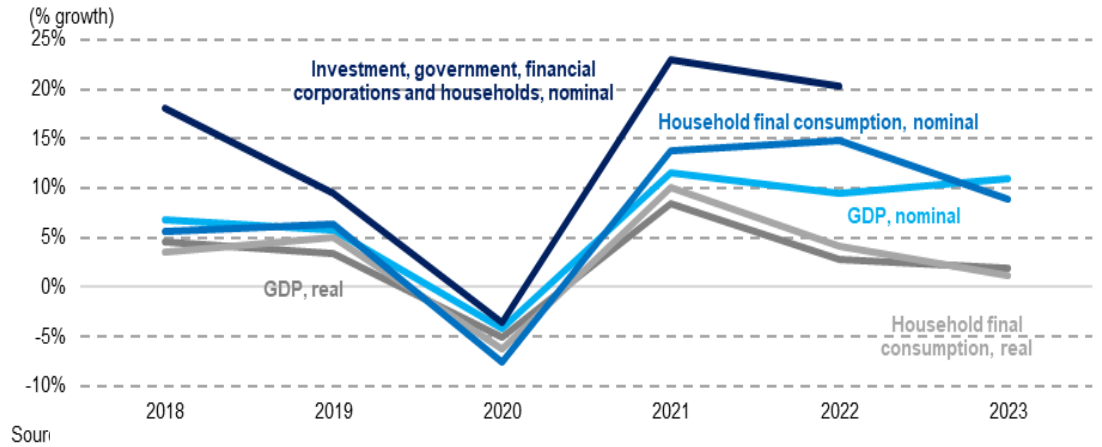
Source: own elaboration based on Eurostat.

Figure 142: RO: Growth in key macroeconomic drivers (% growth, 2018–2023)



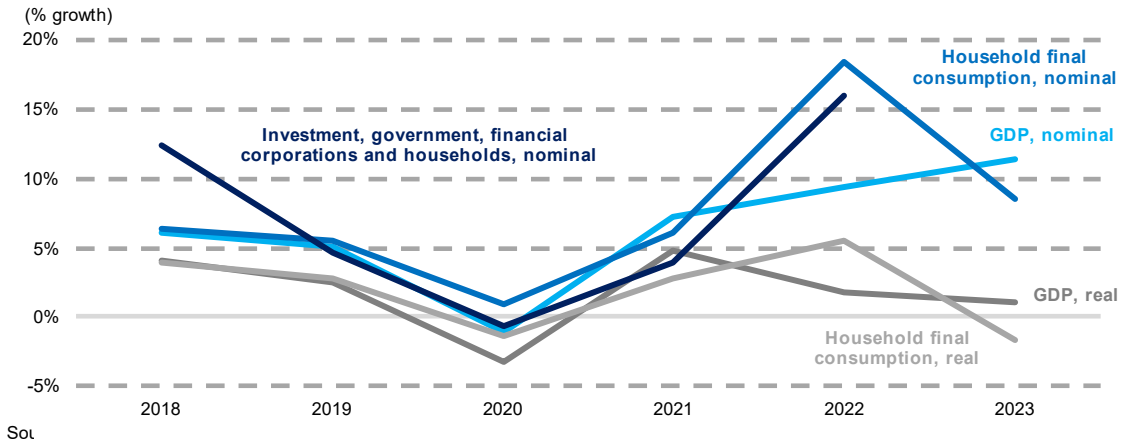
Source: own elaboration based on Eurostat.

Figure 143: SI: Growth in key macroeconomic drivers (% growth, 2018–2023)



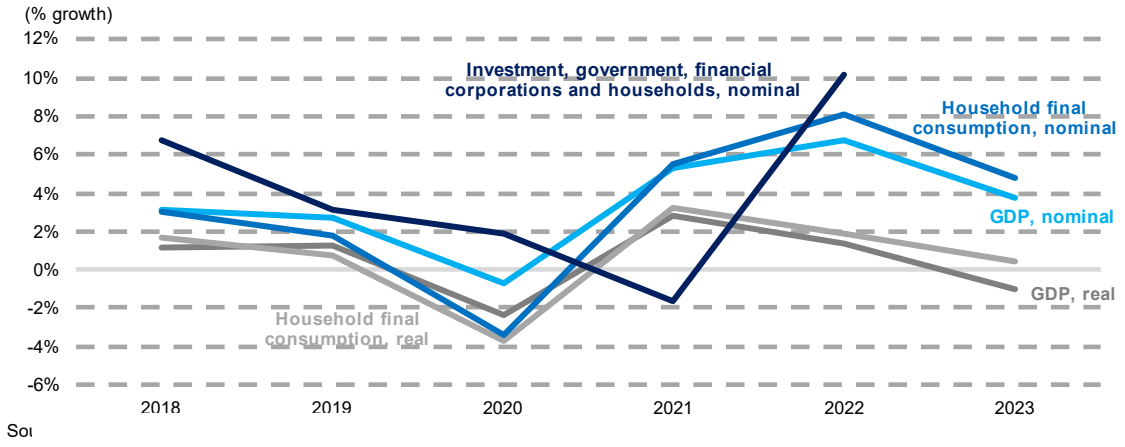
Source: own elaboration based on Eurostat.

Figure 144: SK: Growth in key macroeconomic drivers (% growth, 2018–2023)



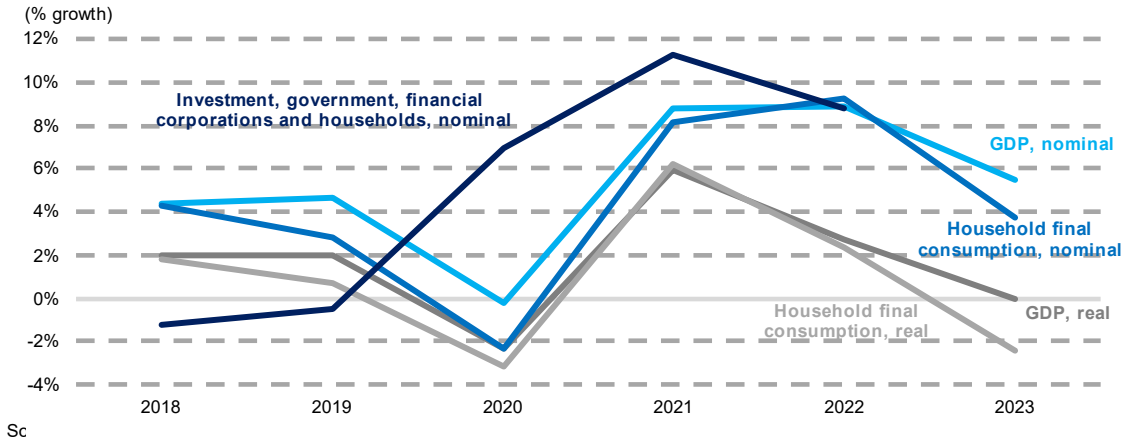
Source: own elaboration based on Eurostat.

Figure 145: FI: Growth in key macroeconomic drivers (% growth, 2018–2023)



Source: own elaboration based on Eurostat.

Figure 146: SE: Growth in key macroeconomic drivers (% growth, 2018–2023)



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Source: own elaboration based on Eurostat.

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