



BELGIUM

TECHNICAL ASSISTANCE REPORT- REVENUE ADMINISTRATION GAP ANALYSIS PROGRAM – THE VALUE ADDED TAX

May 2023

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TECHNICAL ASSISTANCE REPORT

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Revenue Administration Gap Analysis Program –
The Value Added Tax

April 2023

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Revenue Administration Gap Analysis Program – The Value Added Tax

Eric Hutton, Polina Prokof'yeva



Technical Assistance Report

April 2023

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ABBREVIATIONS & ACRONYMS

FAD	Fiscal Affairs Department
IMF	International Monetary Fund
RA-GAP	Revenue Administration GAP Analysis Program
VAT	Value-added Tax
V-GEM	VAT – Gap Estimation Model

EXECUTIVE SUMMARY

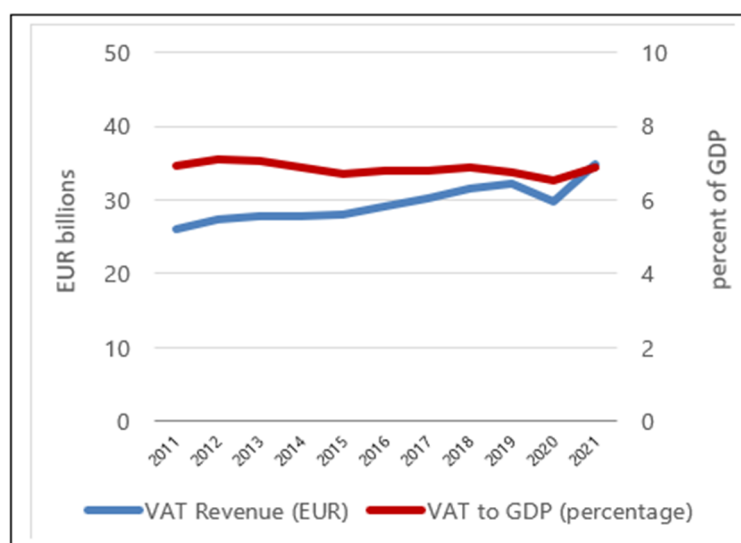
This report presents the results of applying the RA-GAP VAT gap estimation methodology to Belgium for the period 2011-2021. The Revenue Administration Gap Analysis Program (RA-GAP) methodology employs a top-down approach for estimating the potential Value-Added Tax (VAT) base, using statistical data on value-added generated in each sector. There are two main components to this methodology for estimating the VAT gap: 1) estimate the potential VAT collections for a given period; and 2) determine the accrued VAT collections for that period. The difference between the two values is the VAT gap.

RA-GAP provides estimates of the two components of the tax gap: the compliance gap and the policy gap. The compliance gap is the difference between the potential VAT that could have been collected given the current policy framework and actual accrued VAT collections. The policy gap is the difference between the overall tax gap and the compliance gap. In order to put the level and trends of the compliance gap into context, it is also necessary to analyze the level and trends of the overall tax gap and the policy gap.¹

Main Findings

VAT collections have, on average, remained relatively stable in real terms over the period 2011 through 2021, the period under review for this report, at around 7 percent of GDP (Figure 1). There was a slight decline between 2012 and 2015, which coincides with a period during which some minor policy adjustments were made, and there was a drop in revenue in 2020 related to the pandemic. Revenues in 2021 were, however, back to roughly the same level they were in 2011.

Figure 1. Value-Added Tax Revenues

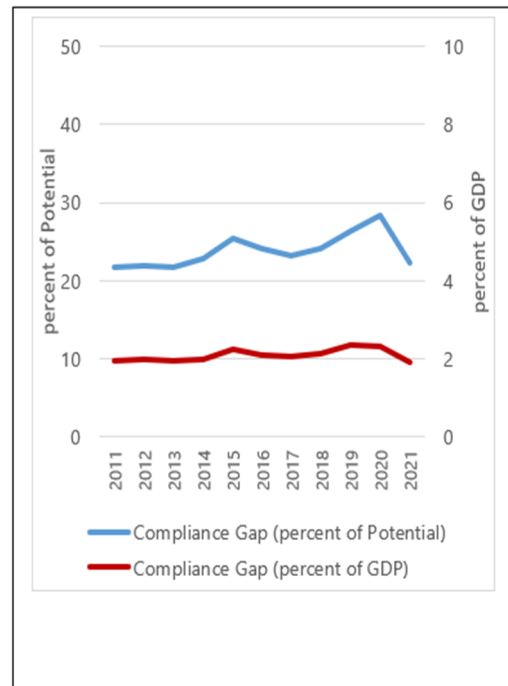


Source: IMF staff calculations.

¹ The compliance gap is further broken down into a collection and assessment gap, while the policy gap is broken down into an expenditure and efficiency gap. The measure for the compliance gap is also compared against estimates using other methodologies.

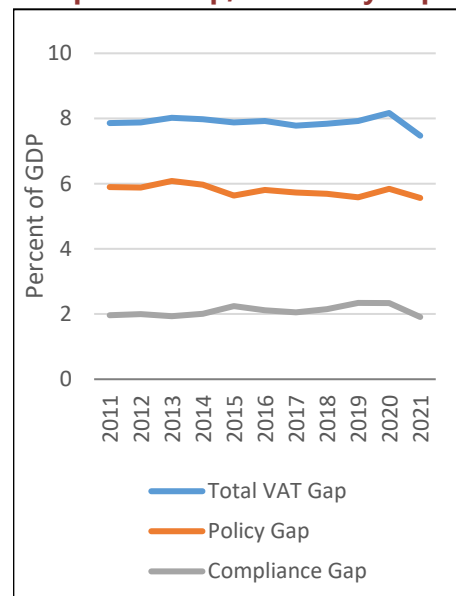
Like the VAT revenues, the compliance gap, as a percent of GDP, has appeared to be largely stable over the period 2011 to 2021 at around 2 percent of GDP (Figure 2). The compliance gap as a percent of potential shows a bit more volatility, with perhaps just a slight upward trend, starting off the period at around 21 percent, then ending the period at around 22 percent. The peak that appears in 2015 corresponds with a change in the series of the statistical data used to estimate the potential VAT base, and so this change could be related to that. The more significant increase that occurs in 2019 and 2020 is related to the cash effect of some of the relief provisions provided to taxpayers which resulted in deferred payments, in particular advance payments were made non-obligational in December 2020, shifting those revenues to January 2021.²

Figure 2. Value-Added Tax Compliance Gap



The total VAT gap, including the policy gap, has also been mostly stable, apart from an apparent sharp drop in 2021 from around 8 percent of GDP to a level closer to 7 percent (Figure 3). This drop in 2021 is the result of reductions in both the policy and compliance gaps for this period. It is of interest that the policy gap shows an increase in 2019 to 2020 and then a decrease from 2020 to 2021 because during this period the only policy change of significance was a decrease in the VAT rate for restaurant and catering services, which would have a positive increase in the policy gap, so this was offset by the negative effect of an increase in the overall proportion of the taxable portion of the potential tax base—for example a decrease between 2020 and 2021 in the relative size of the public sector.

Figure 3. Value-Added Tax Gap, Compliance Gap, and Policy Gap

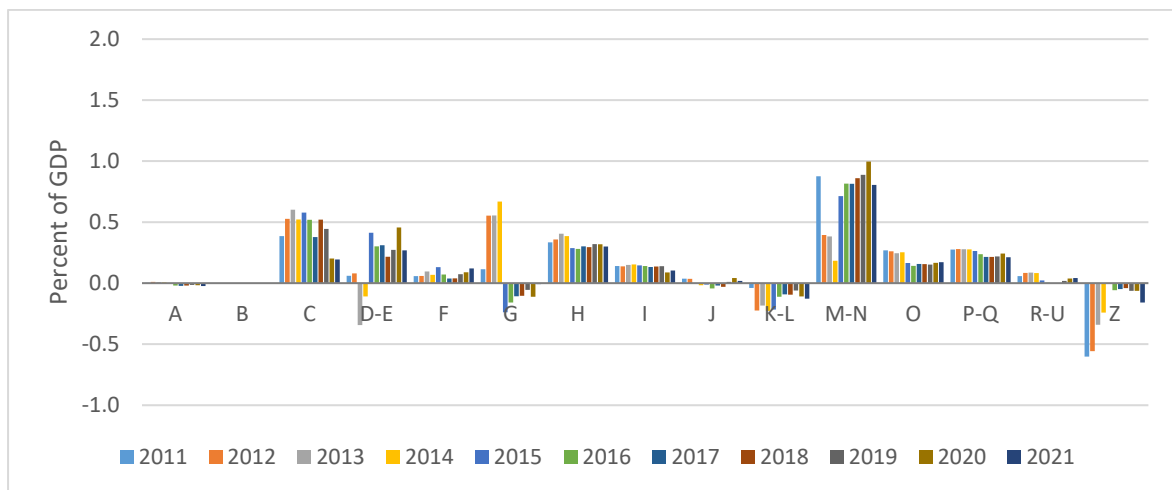


Source: IMF staff calculations

² In December 2019 these advance payments consisted of 3.1-3.4 billion euros. In December 2020 some taxpayers still paid these advance payments (±800 million euros).

The compliance gap appears to be largely concentrated in the Professional and Managerial Services sector (Figure 4). The data on the sector of activity for taxpayers came from two different sources for this chart—the years 2011 to 2014 draw upon the information in the taxpayer registry, while the data for years 2015–2021 uses information provided by the statistics office. A further differentiation between the two periods is that a breakdown of collections at customs by sector was not available for the 2011 to 2014, and so these collections all had to be lumped into the “Z: unknown” sector. Due to these issues, the inferences about the sectoral allocation are largely based on the results for the period 2015–2021. This data points to a compliance issue in professional and management services (lawyers, accounts, head office activities, etc.) and then also a possible issue in manufacturing. The results on the distribution of the compliance gap by sector are not to be considered definitive, only suggestive, and so further analysis needs to be conducted (review of the distribution of audit results for example) to corroborate or refute these findings and to find possible causes for the noncompliance in these sectors—this analysis on its own cannot determine the cause of the noncompliance.

Figure 4. The Compliance Gap by Sector



Sector Code	Sector Description	Sector Code	Sector Description
A	Agriculture, Forestry, Fishing	J	Information, Communication
B	Mining, Extraction	K-L	Finance, Insurance, Real Estate
C	Manufacturing	M-N	Professional/Management
D-E	Utilities	O	Public Sector
F	Construction	P-Q	Education, Health Care
G	Trade	R-U	Other Services
H	Transportation	Z	Unknown/unprovided
I	Hospitality		

Sources: IMF staff calculations.

I. BACKGROUND

1. **The IMF RA-GAP program provides a comprehensive quantitative analysis of the gap between potential revenues and actual collections, known as the compliance gap.** The program is conducted by the Revenue Administration Divisions of the Fiscal Affairs Department, initially focusing on gap analysis of the value-added tax (VAT). The RA-GAP model uses an approach that allows for a breakdown of the compliance gap by sector of economic activity, thereby helping revenue administrations monitor and identify what is contributing to this gap.³

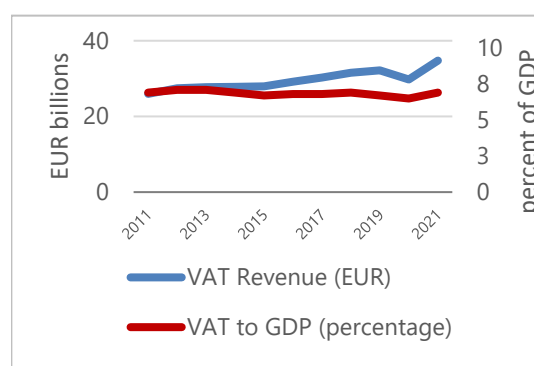
2. **This report presents an estimate of the level and recent trends of the tax gap for VAT in Belgium using the RA-GAP approach.** Available national account data was used to estimate the potential revenues under the current VAT legislation. These potential VAT revenues are then compared with collection data. The difference between potential revenue and actual collections represents the compliance gap—the degree of non-compliance of taxpayers.

A. Value-Added Tax Revenue Performance

3. **Belgium has had a fairly stable VAT policy framework over the past decade.** The VAT was first introduced in 1971 at a standard rate of 18 percent. Currently, the standard rate is 21 percent with special rates of 6 and 12 percent that are applied to select goods and services. There have only been a few minor changes to the policy framework over this period, most recently, as a response to the pandemic, changes to the rates for certain pandemic related products such as face masks and vaccines were made, nothing that would significantly impact revenues.⁴

4. **VAT collections as a percent of GDP have remained relatively stable over the period 2011 to 2021. (Figure 5).** Measured as a percent of GDP, revenues were at around 6.9 percent in 2011, were at their lowest at 6.5 percent in 2020, but then rebounded back to 6.9 percent in 2021. Nominal VAT collections were increasing over the period except for 2020. VAT revenues increased from 26.0 billion euros in 2011 to 32.2 billion euros in 2019. In 2020, VAT collections declined by 2.4 billion euros, but then were back up to 34.8 billion in 2021.⁵

Figure 5. Value-Added Tax Revenues



Source: IMF staff calculations.

³ A list of definitions for a number of the conceptual and practical terms related to the VAT gap used in this report are laid out in Appendix II.

⁴ Some more significant changes have been made since 2021, notably in regards to the treatment of electricity and gas, but these, of course, do not affect the results for the periods considered in this report.

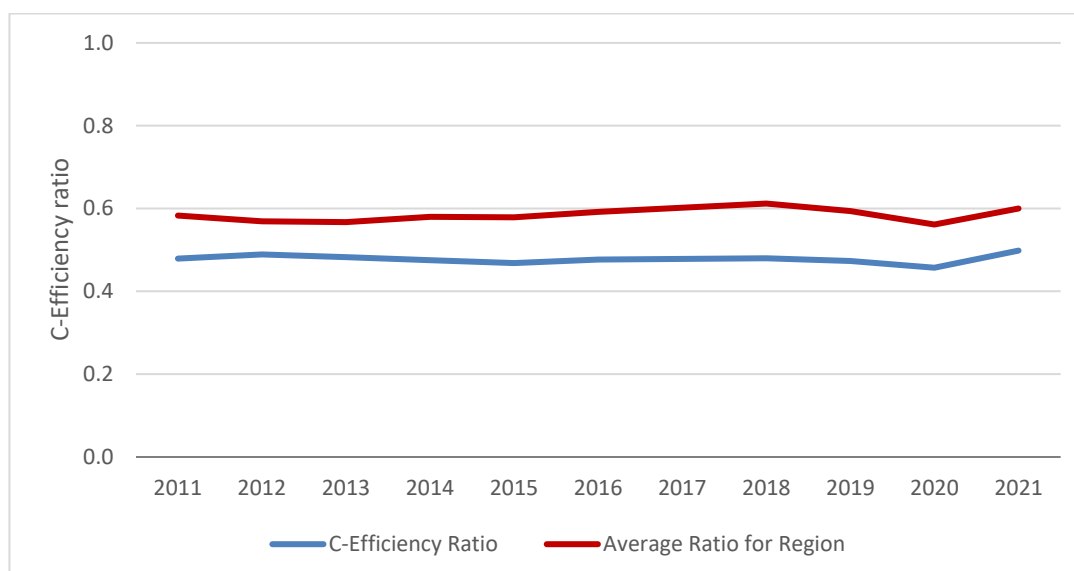
⁵ Data for all charts in this report is contained in Appendix I

B. Relative VAT Performance

5. **The c-efficiency ratio can be used to analyze the relative performance of VAT revenues while accounting for differences in the standard rate.** The c-efficiency ratio is calculated from VAT revenues, the VAT standard rate, and final consumption aggregates to indicate the overall performance of VAT revenues. It presents the ratio of actual VAT collections to the theoretical revenues under a perfectly enforced tax levied at the standard rate on all final consumption without any exemptions. The yearly changes in c-efficiency ratio can be decomposed into several factors: changes in the compliance gap, changes in the effects of VAT expenditures (deviations from the application of the standard rate), changes in the share of total final consumption represented by nontaxable consumption, and timing effects of cash payments and refunds.

6. **C-efficiency in Belgium was lower than the average for the European⁶ countries over the period 2010-2020 (Figure 6 and 7).** The average c-efficiency for European countries was relatively stable from 2011 to 2015 but showed a moderate increase between 2016 and 2019. C-efficiency in Belgium remained relatively unchanged. Over the period 2011-2021, the average c-efficiency in Belgium was 0.48 compared to the region's average of 0.58. C-efficiency in Belgium is negatively affected due to the large size of the public sector in the country; countries with large public sectors in general will tend to have lower c-efficiency levels all else being equal, as the large public sector results in a higher proportion of final consumption which is not subject to VAT.

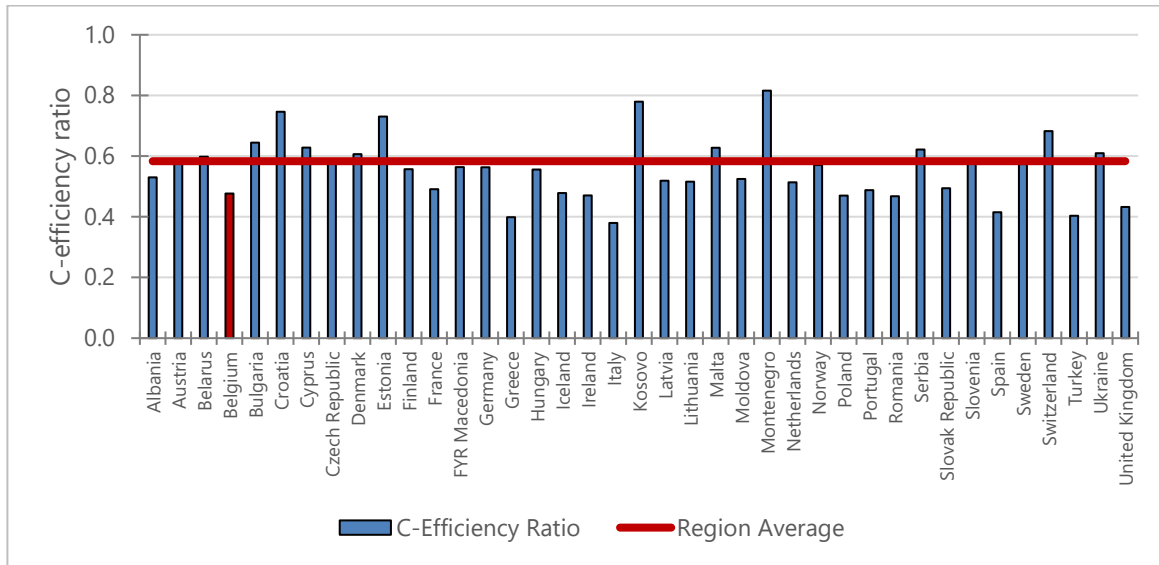
Figure 6. C-Efficiency for Belgium Compared to Average for European Countries



Source: IMF staff calculations.

⁶ Based on data for countries within the IMF Europe Area Department's administrative region.

Figure 7. Average C-Efficiencies in Europe over the period 2011-2020



Source: IMF staff calculations.

7. The purpose of a comprehensive tax gap analysis is to account for factors that may affect c-efficiency. Multiple factors can affect the level, and changes to the level, of c-efficiency and therefore, while the c-efficiency indicator is useful for comparative performance analysis, it has limitations as a diagnostic indicator. A low level of c-efficiency is not necessarily an indicator of VAT performance problems. The factors that affect the level, and changes to the level, include compliance, and the VAT policy framework, but it is also affected by the composition of the tax base – as mentioned above a country with a very high level of public expenditures would tend to have a lower c-efficiency value. Tax gap analysis allows for a more nuanced examination into tax revenue performance and the factors that are affecting that performance.

II. ESTIMATES OF THE VALUE-ADDED TAX GAP

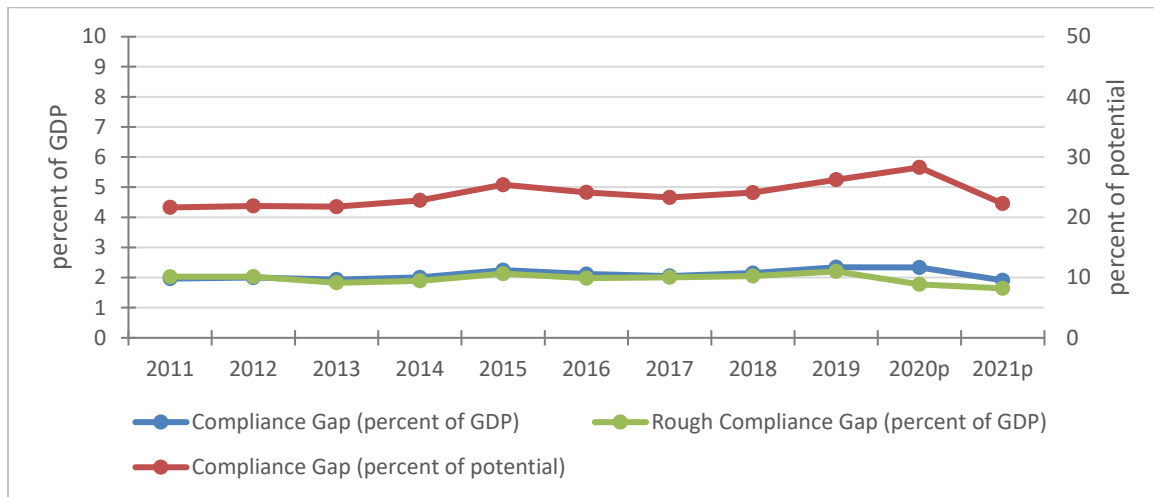
8. The VAT gap for a particular year is the difference between revenues collected for a given year and the potential revenues that could have been collected given the economic activity that took place during that year. The RA-GAP approach was used to estimate the VAT gap for the years 2011-2021 in this report. Potential VAT revenues were estimated using detailed national accounts data published by the national statistics agency.

A. The Compliance Gap

9. The compliance gap is the difference between the potential VAT given the current policy framework and actual VAT revenue. The compliance gap thus directly measures the performance of a revenue administration in collecting the tax due from taxpayers. As estimates for the compliance gap must rely on statistical data to determine the level of Potential VAT, the estimates will have an error margin similar to that for the underlying statistics. It is therefore generally more useful to use estimates of the compliance gap to assess *trends* in compliance, rather than the *level*.

10. The compliance gap has fluctuated over the period, but on average has remained relatively constant at just over 20 percent of potential (Figure 8). This has translated into a gap of around two percent of GDP. There have been two periods where the compliance gap has increased: in 2015 and in 2020. The apparent increase in the compliance gap in 2015 corresponds with the timing of a change in the methods used to generate the statistical data used in estimating the potential VAT, so this one-time, short-lived increase could be an artefact of the change in the statistical methodology. The large increase in the estimated compliance gap in 2020, reaching close to 30 percent of potential, of course coincides with the COVID pandemic. This apparent spike in the compliance gap could be partially due to a “cash” effect, where taxpayers might have taken advantage of deferred payment schemes introduced to reduce the impact on business of the pandemic. While the RA-GAP method dictates using accruals based measures of VAT collections, limitations in the IT systems prevented the production of such a measure and so the compliance gap is being measured using reported collections, which are not fully on an accruals basis, as a proxy for accrued collections.

Figure 8. The Compliance Gap



Source: IMF staff calculations.

The Assessment and Collection Gaps

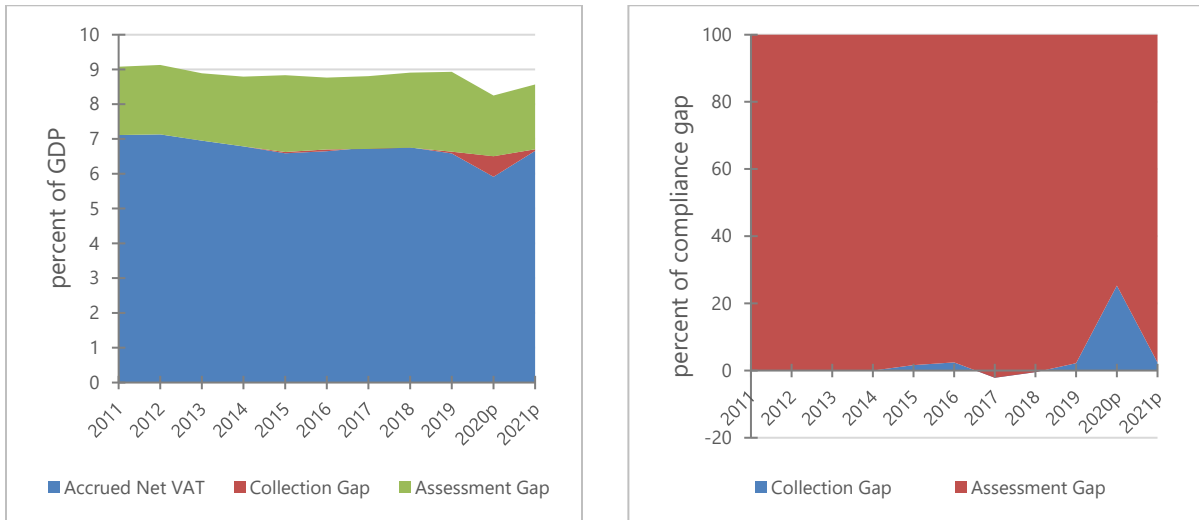
11. The compliance gap can be broken down into an *assessment gap* and a *collection gap*. The assessment gap is the difference between the estimated VAT that should have been declared (i.e., potential VAT collections under existing VAT policies) and the VAT which has been declared or assessed. The collections gap is the difference between VAT declared or assessed and the VAT actually paid. The collections gap, in other words, represents known outstanding debt by taxpayers, while the assessment gap represents taxable activity that the administration has not assessed. These two gaps are also sometimes referred to as the known portion of the compliance gap (the collections gap) and the unknown portion of the compliance gap (the assessment gap).⁷

12. The great majority of the overall compliance gap was attributable to the assessment gap - but the collection gap could not be properly measured (Figure 9). It is generally the case in most countries that the assessment gap is much higher than the collection gap – the latter represents identified liabilities that can be subject to enforcement action, whereas the former represents unidentified liabilities. This was found to be the case in Belgium. 2020 is notable in these charts in that in this case there is an apparent spike in the collection gap, indicating that the collections fell off even though the assessed VAT due did not. As discussed earlier, this is in part a cash effect, wherein deferred payments that were allowed to be made for obligations from 2020 are not able to be correctly aligned with the period of accrual – this would be a direct result of the relaxation of the obligations to make advance payments that occurred in December 2020, shifting those collections into 2021. This also appears to have partially been the

⁷ These basic measures, with compliance gaps in general, do not take into account uncollectible arrears. This would include arrears written off for cases of bankrupt businesses for example. As such, the collections gap will tend to overstate the amount of potential gain to be achieved from further closing the identified portion of the tax gap. In other words, there might be some normal, or even optimal, nonzero state for the collections gap.

case in 2015-2016, where we can see in the chart on the right in Figure 9 that the collection gap rises slightly in 2015 and 2016, but then goes *negative* for 2017, indicating that more payments were received than were assessed, which is typically the result of an issue in comparing cash collections (payments less refunds) against the accrued obligations (tax declared and assessed). To properly measure the collection gap data on the collections on an accrual basis is necessary, but this data could not be produced at this time due to system reporting limitations.

Figure 9. The Assessment and Collection Gap



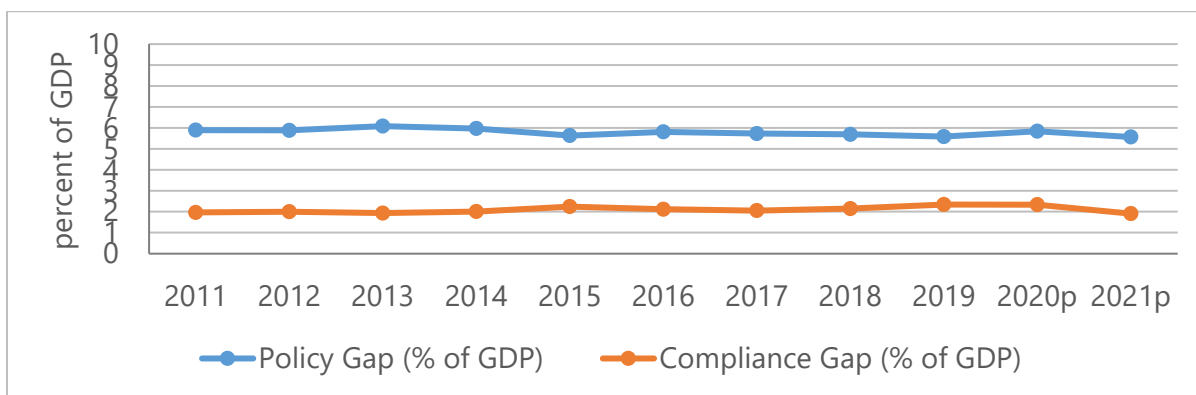
Source: IMF staff calculations.

B. The Policy Gap

13. The *policy gap* is the difference between the potential VAT if all final consumption were taxed at the current standard rate and the potential VAT given the current policy framework. The size of the policy gap is affected by two factors: changes in the policy structure, and changes in the composition of the tax base. In other words, the policy gap may increase or decrease without any explicit changes in policy; if there is a shift in final consumption from items subject to standard-rated VAT to exempt or reduced rate items the policy gap will increase.

14. While the policy gap dropped slightly in 2015 it was not significant and has remained fairly constant at around 6 per cent of GDP (Figure 10). While there have been a few adjustments in VAT policy over the period, these have for the most part been rather small adjustments to the treatment of small categories of goods or services, nothing which has results in too significant a change in the potential yield for the VAT.

Figure 10. The Policy Gap and the Compliance Gap



Source: IMF staff calculations.

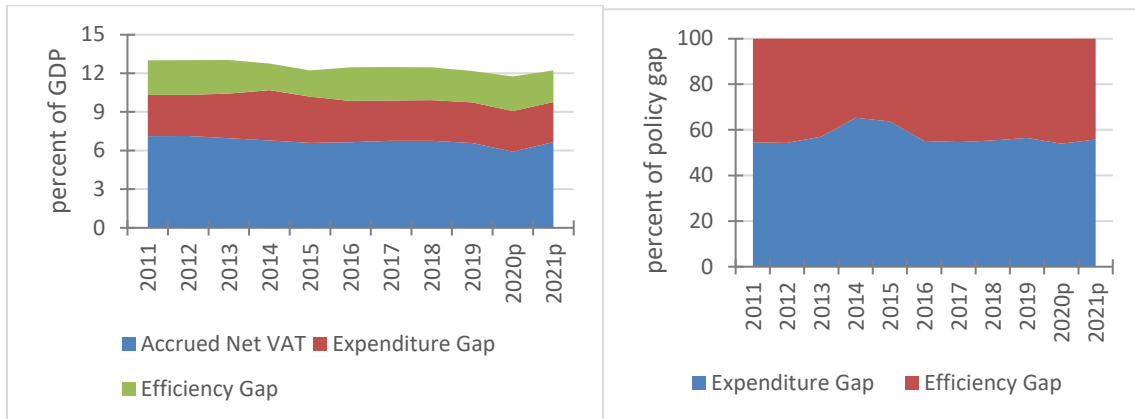
The Expenditure and Efficiency Gap

15. The policy gap can be broken down into an *expenditure gap* and an *efficiency gap*.

The expenditure gap is the difference between the potential VAT where most of final consumption is taxed at the standard rate, but where a set of minimal standard exemptions are maintained, and the potential VAT given the current policy framework. In other words, the expenditure gap is the component of the policy gap due to tax expenditure decisions. The efficiency gap is the difference between the potential VAT if all final consumption were taxed at the current standard rate and the potential VAT where most of final consumption is taxed at the standard rate, but where a set of minimal standard exemptions are maintained.⁸ In other words, the efficiency gap is the portion of the policy gap that results from the typical VAT exemptions necessary due to pragmatic considerations in the design of a VAT. Another way to look at these two measures is that these two components divide the policy gap into the portion where revenue mobilization opportunities exist (the expenditure gap) and the portion where there is little opportunity for revenue mobilization (the efficiency gap).

⁸ The set of minimum exemptions includes: maintaining the exemption for financial services, which is typical of almost all VATs in the world; retaining the current treatment of the public sector, since changes to the treatment of the public sector might yield revenue changes in the VAT model but would actually be netted out by equivalent changes to public expenditures; and maintaining the exemption for housing, as this is a common characteristic of almost all VATs in the world, and the measurement of housing in national accounts includes imputed rents which are not actual market transactions and so would not be subject to VAT in any case. It should be noted that the EU's sixth directive prescribes a broader set of exemptions than the list included here; this normative structure is not meant to be a policy prescription but is simply an attempt to establish a baseline value in line with international norms.

Figure 11. The Efficiency and Expenditure Gap



Source: IMF staff calculations.

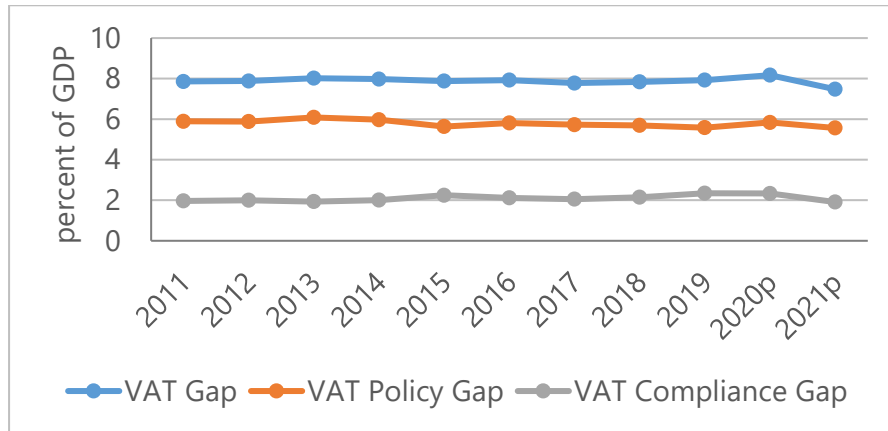
16. The changes in the policy gap might have had more to do with changes in the efficiency gap over the period (Figure 11). Changes in the efficiency gap generally come about due to changes in the relative size of the public sector than they do from explicit changes to tax policy. The model shows that there was a definite contraction in the size of the efficiency gap in 2014 and 2015, which corresponds to the initial slight drop in the overall policy gap. This corroborates the conclusion that the small changes in VAT policy that have occurred over the period have not themselves significantly affected potential VAT revenues.

C. The Overall Value-Added Tax Gap

17. Combining the policy gap and the compliance gap into the overall VAT gap yields an indicator of overall revenue performance. The overall VAT gap can either be measured directly, as being difference between the potential VAT if all final consumption were taxed at the current standard rate and actual VAT revenue or derived by combining the policy and compliance gaps.

18. The overall VAT gap has remained constant at around 8 percent of GDP for the period, with perhaps a slight drop in 2021 (Figure 12). The slight increase in the compliance gap in 2015 is offset by the slight decrease in the policy gap, leading to a relatively level overall value.

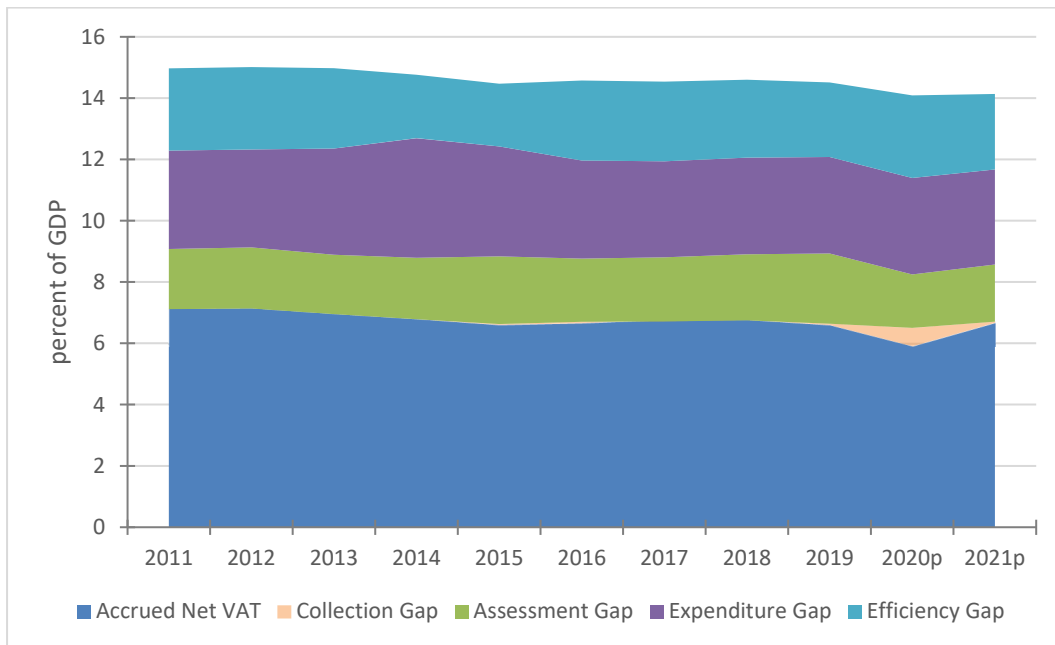
Figure 12. The VAT Gap, the Compliance Gap, and the Policy Gap



Source: IMF staff calculations.

19. The largest component of the overall VAT gap is the expenditure gap, but the efficiency and assessment gaps are also significant contributors (Figure 13). Of these, only the assessment and expenditure gaps present revenue mobilization opportunities, as the exemptions behind the efficiency gap cannot realistically be removed. As noted above, the collection gap was generally nonexistent throughout the period examined.

Figure 13: Actual Value-Added Tax and Components of the Gap

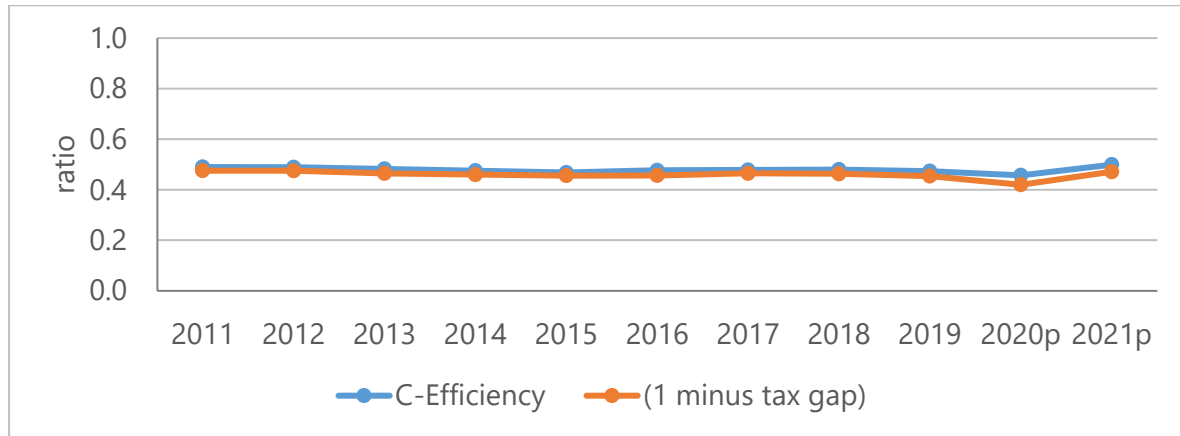


Sources: IMF staff calculations.

20. The trends and changes to the level of the estimated VAT gap are consistent with the observed c-efficiency ratio (Figure 14). Observed c-efficiency should equal to one minus

the total VAT gap, i.e. $(1 - \text{VAT gap})$ or $(1 - \text{policy gap}) \times ((1 - \text{compliance gap})^9$. This serves as a measure of assurance that the overall VAT gap estimates have been estimated correctly. In this case there is a strong level of consistency between the two measures, apart from the year 2020.

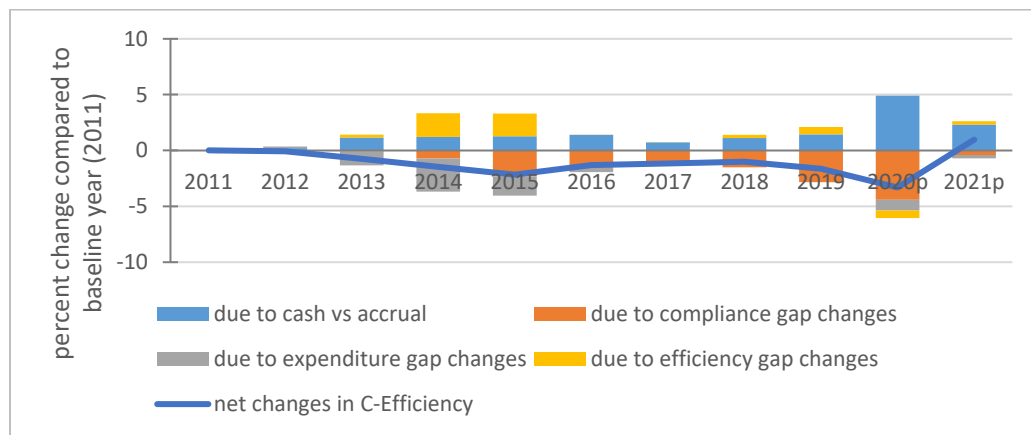
Figure 14. One minus the Value-Added Tax Gap versus the C-efficiency Ratio



Source: IMF staff calculations.

21. There have been minor fluctuations in c-efficiency as compared to the 2011 value (Figure 15). For the most part these variations have been small, largely less than two percent, with the changes to the compliance gap tending to decrease the level of c-efficiency, but with that influence being offset by the minor differences between the levels of official VAT and the level of VAT collections arrived at using the micro data (a rough approximation of the impact of cash versus accruals-based measures for revenue).

Figure 15. Impact of the Tax Gap Components on C-Efficiency



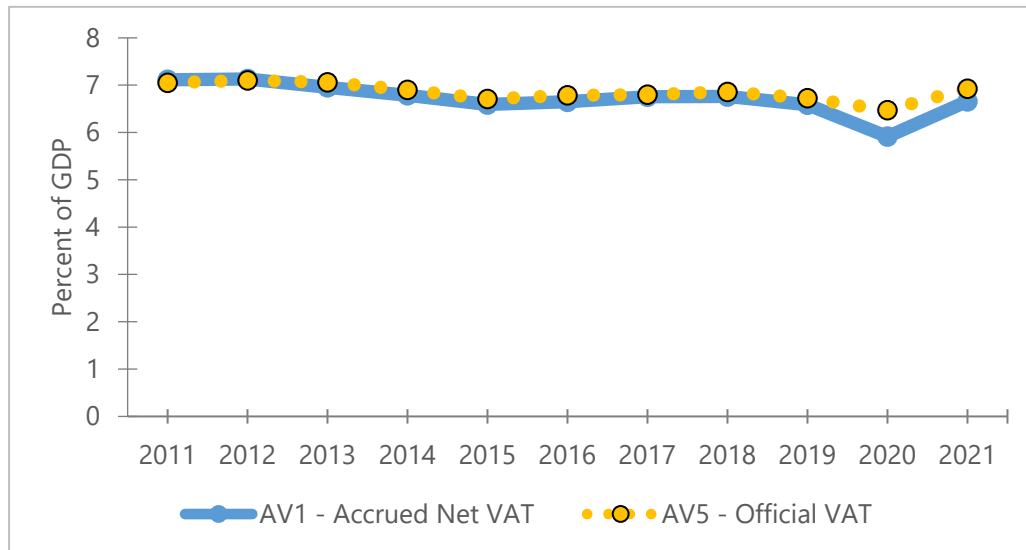
Sources: IMF staff calculations.

⁹ See *The Anatomy of the VAT*, Michael Keen, IMF, 2013. Link: <https://www.imf.org/external/pubs/ft/wp/2013/wp13111.pdf>

Box 1. Measurement of Actual Value-Added Tax

The RA-GAP approach to estimating the compliance gap employs an accrual measurement for actual VAT; that is using micro-level taxpayer data to associate the tax with the relevant tax period, rather than with the payment period. This is done to better match the economic activity declared by the taxpayer (as provided on their VAT declaration) and corresponding payments to the economic activity as recorded in the statistical data. In the long run, cash values for revenue should average out with the accrued values (ignoring penalties and interest). In the short run cash performance tends to be more volatile than accruals.

Figure 16. RA-GAP Accrual Measurement and Official Values for Value-Added Tax Collections



Sources: IMF staff calculations.

Differences between accrual and cash values are largely driven by cash management issues: timing of debt collections and refund payments, and excess credit carry-forward mechanisms (wherein excess VAT credit is not immediately refunded but is used as a credit towards future VAT or other tax obligations). There is a tendency for the cash measure to be pro-cyclical. Cash collections improve and excess credit carry forwards accumulate during periods of economic growth, and cash collection worsens, and excess credit is drawn down in periods of decline. Inflation can also play a role in differing accruals and cash measures. Due to the lag between tax periods and payment deadlines, severe inflation produces lower ratios of cash collections to economic activity compared to the accrued collections to economic activity.

In this case, however, a proper accrual measure could not be performed using the micro data. There was still, however, a notable difference between the measure for actual VAT constructed from the micro data and the official VAT revenue figures for 2020. This is likely the result of the relaxation in December 2020 of the obligation for taxpayers to make advance payments, which results in the dip in the AV1 figure for 2020, but this has been smoothed out for the AV5 indicator as this change in the advance payment scheme was accounted for in its construction (i.e., it was constructed using a time lagged approximation of accrued collections).

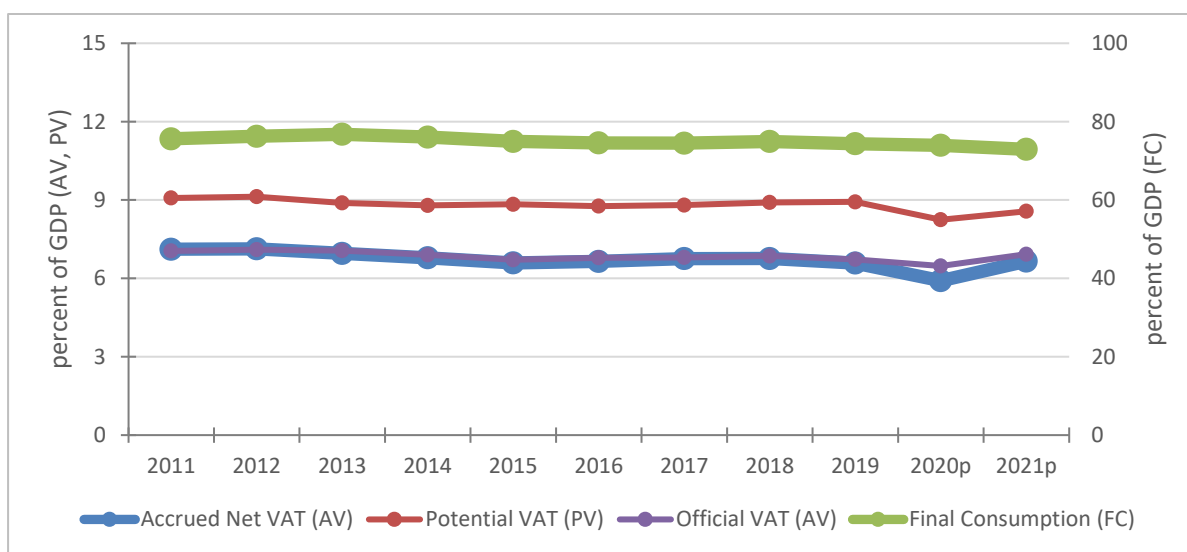
III. FURTHER ANALYSIS OF THE COMPLIANCE GAP

A. Potential and Actual Value-Added Tax

22. It is not enough to understand how compliance has been changing, it is also necessary to understand why it may have been changing. While an understanding of how the compliance gap has been changing over time is useful in evaluating the overall performance of a revenue administration, it does not necessarily assist an administration in understanding how to address any compliance issues. This section of the report includes some additional breakdowns of factors which affect the compliance gap in order to better understand what might be contributing to the changes in the compliance gap.

23. Potential VAT dropped slightly from 2012 to 2013, then remained constant until a big drop in 2020 (Figure 17). Potential VAT dropped from slightly over 9 percent of GDP in 2011 and 2012, to slightly under in 2013. Final consumption, which is a major component of the potential VAT base also fell slightly in this period. There was a slight recover of potential VAT in 2018 and 2019, even though there was no similar recovery in final consumption, which indicates that there could have been a shift in the relative consumption of taxable vs exempt supplies. In 2020 the drop in potential VAT that occurred, which is not reflected in a drop in final consumption, is an indicator that final consumption was being buoyed up by components not in the VAT base, e.g., public goods.

Figure 17. Potential and Actual Value-Added Tax



Sources: IMF staff calculations.

B. Potential and Actual Value-Added Tax by Sector

24. The largest component of potential VAT is in the trade sector, but this is closely followed by the professional and managerial services sector, both of which also contributes the bulk of actual VAT (Figure 18). For the actual VAT series, the breakdown by

sector is based on different sources for the sector codes for taxpayers for the periods 2011-2014 and for 2015-2021. For the latter period data on the sector codes of taxpayers as codified by the statistical authorities was available to use, providing a more reliable linkage to the breakdown of economic activity by economic sector as estimated for the national accounts. In addition, for the period 2011-2014, as microdata for Customs collections was not available, aggregate collections could only be attributed to the "Z" sector (taxpayers for which a sector code was not available) which significantly contributes to the difference in the sectoral allocation between the two periods.

Figure 18. Trends in Potential and Actual Value-Added Tax by Sector

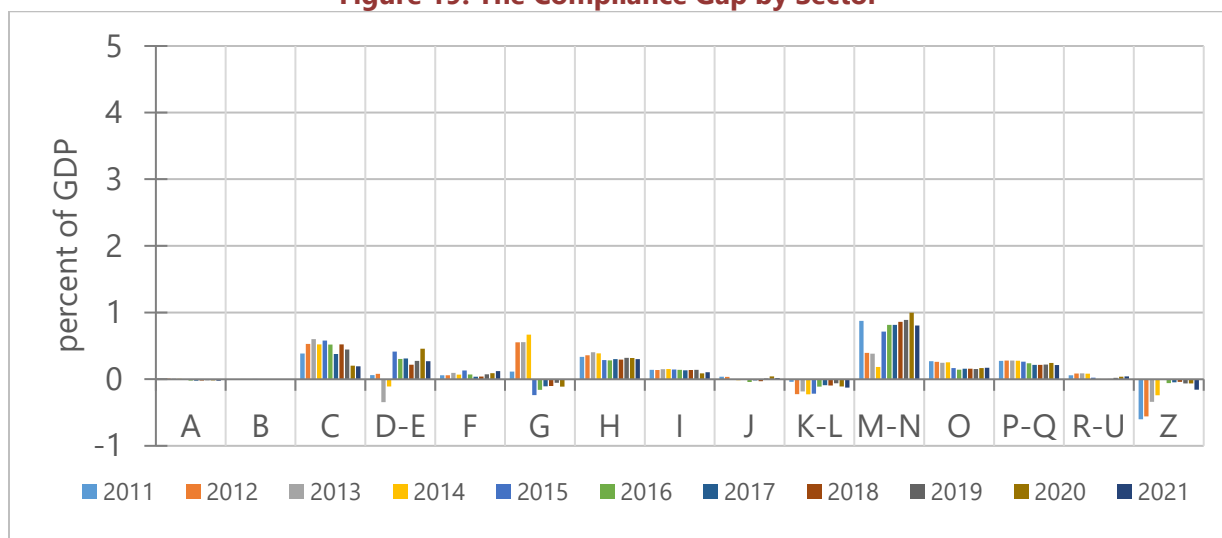


Source: staff calculations

C. The Compliance Gap by Sector

25. **The compliance gap appears to be the highest in the professional and managerial services sector (Figure 19).** The inclusion of a lot of white space in this chart is intentional, it is there to illustrate the size of these gaps relative to potential and actual VAT. As stated above, the sectoral distribution of actual VAT is more reliable for the period 2015-2021, and so the focus should be on these results. For this period, the gap is clearly the highest in the M-N sector, which would include accountancy services, legal services, and corporate head office functions. These activities do tend to have issues with non-compliance in many countries (the other common sectors being construction, retail trade, and hospitality services). Due to the imprecision in the gap estimation exercise, results are only considered significant when they exceed a half percent of GDP, indicating that the gap is not all that significant in any other sector, although the manufacturing sector comes close to this threshold. For the M-N sector, the gap becomes significant due to the relatively large size of this sector in the Belgian economy (which is related to Belgium's position as being the seat of the European Commission and so attracts a lot of these type services), and so any level of non-compliance in the sector quickly becomes notable. These results are not a sufficient indicator of a compliance issue in a particular sector, they only are intended to provide an indication that further investigation is warranted.

Figure 19. The Compliance Gap by Sector



Sector Code	Sector Description	Sector Code	Sector Description
A	Agriculture, Forestry, Fishing	J	Information, Communication
B	Mining, Extraction	K-L	Finance, Insurance, Real Estate
C	Manufacturing	M-N	Professional/Management
D-E	Utilities	O	Public Sector
F	Construction	P-Q	Education, Health Care
G	Trade	R-U	Other Services
H	Transportation	Z	Unknown/unprovided
I	Hospitality		

Sources: IMF staff calculations.

IV. OTHER FINDINGS AND OBSERVATIONS

A. Tax Expenditure Estimates

26. The RA-GAP VAT Gap Estimation Model (V-GEM) can be used to produce tax expenditure estimates (Table 1). To produce the VAT gap estimates, and the breakdown of those estimates into the constituent gap components (policy gap and compliance gap) the V-GEM is designed to estimate the revenue potential from various policy frameworks; the policy gap, for instance compares the difference in revenue potential between a “comprehensive” policy structure and the current policy structure. This framework can then be used to compare the difference in revenue potential between any two possible policy structures, as such it can be used to compare the revenue potential for the current structure against a structure where one aspect of the current structure is removed, a particular exemption for instance. This provides a cost estimate for that policy measure, which is what constitutes a tax expenditure estimate. While typically a tax expenditure estimate report, or budget, might provide estimates of policy measures at a highly granular level, the expenditure estimates produced here will be at a level aggregated related to the type of policy treatment in question (e.g., exemptions, versus reduced rates) and the general area of the tax base affected (e.g., food stuffs versus hospitality services). In addition, two estimates for each tax expenditure element are provided; one where the cost of the measure is calculated assuming an environment of full compliance, and one where the current average level of compliance is applied to the estimate; this secondary estimate is provided in acknowledgement that removing a particular tax expenditure would yield less revenue in reality than modelling might suggest, as the current cost of the expenditure is likely already being reduced due to non-compliance. As with any tax expenditure estimate, the individual elements cannot be added together to produce the overall policy gap, as this would result in some double counting of costs; for example, the cost associated with having a general threshold under which businesses are not required to register for the VAT would overlap with the costs of most of the other expenditures.

27. The costliest tax expenditure is the reduced rates for foods, coming in between 0.8 and 1.0 per cent of GDP (Table 1). Food items are typically one of the highest costing tax expenditures under a VAT, given the importance of their value in final consumption. The next costliest tax expenditures are also rather typical, being those related to construction real estate and housing, which, again, is to be expected due to the importance of these purchases in final consumption. At around the same level of this though is the combined cost of the reduced rates all the “other goods and services”, which is largely comprised of agricultural inputs, medical devices, and transportation services. The next largest expenditure would then be the reduced rate for hospitality services (hotels and restaurants).

Table 1. Estimated Cost of Tax Expenditure Categories for 2021

Policy Gap Component	Policy Structure Type	Tax Base Component	Tax Expenditures (full compliance, % of GDP)	Tax Expenditures (current avg compliance, % of GDP)	
Expenditure Gap	Base Adjustment	Input Tax Credit Restrictions	(0.1)	(0.1)	
		Capital Goods Credit Restrictions	-	-	
		Presumptive Input Credits	0.0	0.0	
		Withholding	(0.0)	(0.0)	
	Exemptions	Food	0.1	0.1	
		Hospitality Services	0.1	0.1	
		Construction, Real Estate, Real Estate Services	0.6	0.4	
		Non-margin-based Insurance, Finance	0.3	0.2	
		Private Education, Health Services	0.1	0.1	
		Other Goods & Services	0.1	0.1	
		Reduced, Zero Rating	Food	1.0	0.8
			Utilities/Energy	0.2	0.1
	Hospitality Services		0.5	0.4	
	Construction, Real Estate, Real Estate Services		0.3	0.2	
	Private Education, Health Services		0.1	0.1	
	Other Goods & Services		0.6	0.5	
	Non-Taxable Gap	Base Adjustment	Export/Import of Services to Non-Residents/Residents	0.0	0.0
Exemptions		Threshold	0.0	0.0	
		Margin-Based Finance, Life Insurance	0.6	0.5	
		Public Services	3.6	2.8	
		Other Non-Market Services (Religious Orgs, Unions, etc)	0.4	0.3	
		Other Non-Market Output	-	-	
Reduced, Zero Rating		International Transport	0.2	0.1	

Sources: IMF staff calculations.

B. Other Observations and Remarks.

28. The study was limited due to the unavailability of historical customs collections data. To manage data storage costs a decision had been made to delete older customs record data from all systems, and no archival record was maintained. To partially reduce the impact of this issue, aggregated data was used for the period 2011-2014 and included in the results with data for taxpayers without a known sector code. A review of data retention policies should be conducted because the loss of this data has ramifications beyond the impact on this limited study, it severely limits the ability of the revenue authority, and the Ministry of Finance, in engaging in other studies on taxpayer behavior, such as is required in developing certain compliance risk management models. A modern revenue administration should consider data as a critical resource, and should have management, retention, and protection policies which properly reflect the value (current and potential) of this data.

29. The collection gap could not be assessed due to limitations in the revenue administration's data systems. To properly assess the collection gap, or the level of taxpayer arrears at a given point in time, the information technology systems and databases need to be able to produce a proper accruals-based measurement of tax collections. This can be a challenge in system that use a rolling taxpayer account balance system unless that system also methodologically records and stores the nature of each adjustment to that balance. While the system can provide information on the amount of taxes in arrears, it cannot currently report on the age of those arrears. In considering the design of any possible new data platform, or in considering possible significant reforms to the current system, this aspect of the design should be part of the consideration.

V. APPENDIXES

Appendix I. Data Tables for Included Figures

Table 1. Data for Figures 1 and 5: Value-Added Tax Revenues

Year	VAT Revenue Billions (LCU)	VAT to GDP (percentage)
2010	25.26	6.96
2011	25.98	6.91
2012	27.42	7.10
2013	27.74	7.06
2014	27.80	6.90
2015	27.95	6.71
2016	29.18	6.78
2017	30.25	6.80
2018	31.55	6.86
2019	32.18	6.73
2020	29.76	6.52
2021	34.78	6.87

Table 2. Data for Figure 6: C-Efficiency for Belgium Compared to Average for European Countries

Year	C-Efficiency Ratio	Average Ratio for Region
2010	0.49	0.58
2011	0.48	0.58
2012	0.49	0.57
2013	0.48	0.57
2014	0.48	0.58
2015	0.47	0.58
2016	0.48	0.59
2017	0.48	0.60
2018	0.48	0.61
2019	0.47	0.59
2020	0.46	0.56
2021	0.50	0.60

Table 3. Data for Figure 7: Average C-Efficiencies in Europe over the period 2010-2020

Country	C-Efficiency Ratio
Albania	0.53
Austria	0.59
Belarus	0.60
Belgium	0.48
Bulgaria	0.64
Croatia	0.75
Cyprus	0.63
Czech Republic	0.58
Denmark	0.61
Estonia	0.73
Finland	0.56
France	0.49
FYR Macedonia	0.56
Germany	0.56
Greece	0.40
Hungary	0.56
Iceland	0.48
Ireland	0.47
Italy	0.38
Kosovo	0.78
Latvia	0.52
Lithuania	0.52
Malta	0.63
Moldova	0.52
Montenegro	0.82
Netherlands	0.51
Norway	0.57
Poland	0.47
Portugal	0.49
Romania	0.47
Serbia	0.62
Slovak Republic	0.49
Slovenia	0.59
Spain	0.41
Sweden	0.57
Switzerland	0.68
Turkey	0.40
Ukraine	0.61
United Kingdom	0.43

Table 4. Data for Figures 2 and 8: Compliance Gap

Year	Compliance Gap (percent of Potential)	Compliance Gap (percent of GDP)
2011	21.64	1.96
2012	21.89	2.00
2013	21.76	1.93
2014	22.81	2.01
2015	25.40	2.24
2016	24.14	2.12
2017	23.28	2.05
2018	24.10	2.15
2019	26.24	2.34
2020	28.30	2.33
2021	22.28	1.91

Table 5. Data for Figure 9: The Assessment and Collection Gap
(In percent of GDP)

Year	Accrued Net VAT	Collection Gap	Assessment Gap
2011	7.11	0.00	1.96
2012	7.13	0.00	2.00
2013	6.95	0.00	1.93
2014	6.79	0.00	2.01
2015	6.59	0.04	2.21
2016	6.65	0.05	2.07
2017	6.76	-0.04	2.09
2018	6.76	-0.01	2.16
2019	6.58	0.05	2.29
2020	5.91	0.59	1.74
2021	6.66	0.05	1.86

(In Percent of Compliance Gap)

Year	Collection Gap	Assessment Gap
2011	0	100
2012	0	100
2013	0	100
2014	0	100
2015	1.6	98.4
2016	2.41	97.59
2017	-2.14	102.14
2018	-0.5	100.5
2019	2.2	97.8
2020	25.3	74.7
2021	2.38	97.62

Table 6. Data for Figures 3, 10 & 12: The Tax Gap, Compliance Gap, and Policy Gap
(In percent of GDP)

Year	Total VAT Gap	Policy Gap	Compliance Gap
2011	7.86	5.89	1.96
2012	7.88	5.88	2.00
2013	8.02	6.09	1.93
2014	7.98	5.97	2.01
2015	7.88	5.63	2.24
2016	7.92	5.81	2.12
2017	7.78	5.73	2.05
2018	7.84	5.69	2.15
2019	7.93	5.58	2.34
2020	8.17	5.84	2.33
2021	7.47	5.56	1.91

Table 7. Data for Figure 11: The Efficiency and Expenditure Gap
(In percent of GDP)

Year	Accrued Net VAT	Expenditure Gap	Efficiency Gap
2011	7.11	3.21	2.68
2012	7.13	3.19	2.69
2013	6.95	3.47	2.62
2014	6.79	3.90	2.07
2015	6.59	3.59	2.05
2016	6.65	3.20	2.61
2017	6.76	3.13	2.60
2018	6.76	3.15	2.54
2019	6.58	3.15	2.43
2020	5.91	3.15	2.69
2021	6.66	3.10	2.46

(In percent of policy gap)

Year	Expenditure Gap	Efficiency Gap
2011	54.48	45.52
2012	54.26	45.74
2013	57.01	42.99
2014	65.32	34.68
2015	63.70	36.30
2016	55.09	44.91
2017	54.63	45.37
2018	55.35	44.65
2019	56.42	43.58
2020	53.93	46.07
2021	55.73	44.27

Table 8. Data for Figure 13: Actual Value-Added Tax and Components of the Gap
(In percent of GDP)

Year	Accrued Net VAT	Collection Gap	Assessment Gap	Expenditure Gap	Efficiency Gap
2011	7.11	0.00	1.96	3.21	2.68
2012	7.13	0.00	2.00	3.19	2.69
2013	6.95	0.00	1.93	3.47	2.62
2014	6.79	0.00	2.01	3.90	2.07
2015	6.59	0.04	2.21	3.59	2.05
2016	6.65	0.05	2.07	3.20	2.61
2017	6.76	-0.04	2.09	3.13	2.60
2018	6.76	-0.01	2.16	3.15	2.54
2019	6.58	0.05	2.29	3.15	2.43
2020	5.91	0.59	1.74	3.15	2.69
2021	6.66	0.05	1.86	3.10	2.46

Table 9. Data for Figure 14: One minus the Value-Added Tax Gap and C-efficiency Ratio

Year	Inverse VAT Gap	C-Efficiency
2011	0.48	0.49
2012	0.48	0.49
2013	0.46	0.48
2014	0.46	0.48
2015	0.46	0.47
2016	0.46	0.48
2017	0.46	0.48
2018	0.46	0.48
2019	0.45	0.47
2020	0.42	0.46
2021	0.47	0.50

Table 10. Data for Figure 15: Impact of the Tax Gap Components on C-Efficiency
(In percent of change over previous year)

Year	Change due to Cash vs Accrual	Change due to Compliance Gap Changes	Change due to Expenditure Gap Changes	Change due to Efficiency Gap Changes	Total Change in C-Efficiency
2011	0.00	0.00	0.00	0.00	0.00
2012	0.21	-0.15	0.15	0.00	-0.08
2013	1.15	-0.08	-1.27	0.25	-0.75
2014	1.22	-0.73	-2.96	2.11	-1.46
2015	1.26	-2.32	-1.72	2.04	-2.17
2016	1.39	-1.55	-0.39	0.01	-1.30
2017	0.72	-1.00	-0.05	0.02	-1.16
2018	1.10	-1.52	0.00	0.29	-1.00
2019	1.42	-2.85	0.03	0.64	-1.64
2020	4.91	-4.42	-0.97	-0.67	-3.30
2021	2.32	-0.41	-0.30	0.29	0.97

Table 11. Data for Figure 16: RA-GAP Accrual Measurement and Official Values for Value-Added Tax Collections
(In percent of GDP)

Year	AV1 – Accrued Net VAT	AV5 - Official VAT
2011	7.11	7.05
2012	7.13	7.10
2013	6.95	7.06
2014	6.79	6.90
2015	6.59	6.71
2016	6.65	6.78
2017	6.76	6.80
2018	6.76	6.86
2019	6.58	6.72
2020	5.91	6.47
2021	6.66	6.92

Table 12. Data for Figure 17: Potential and Actual Value-Added Tax
(In percent of GDP)

Year	Potential VAT (current policy structure)	Actual VAT (accruals)
2011	9.08	7.11
2012	9.13	7.13
2013	8.89	6.95
2014	8.79	6.79
2015	8.83	6.59
2016	8.76	6.65
2017	8.81	6.76
2018	8.91	6.76
2019	8.93	6.58
2020	8.25	5.91
2021	8.57	6.66

Table 13. Data for Figure 18: Potential and Actual Value-Added Tax by Sector
(In percent of GDP)

PV1% Potential VAT - Current Policy Structure (% of GDP)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C	0.60	0.70	0.80	0.80	0.70	0.60	0.60	0.60	0.50	0.30	0.40
D-E	0.70	0.60	0.30	0.30	0.60	0.60	0.60	0.50	0.50	0.60	0.60
F	0.00	0.00	0.10	0.10	0.10	0.00	-0.10	-0.10	-0.10	-0.10	0.00
G	3.30	3.40	3.40	3.50	3.40	3.40	3.50	3.50	3.50	3.10	3.40
H	0.30	0.30	0.40	0.40	0.30	0.30	0.30	0.30	0.30	0.30	0.30
I	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.10	0.10
J	0.60	0.60	0.50	0.50	0.50	0.50	0.50	0.50	0.60	0.60	0.60
K-L	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
M-N	2.20	2.10	2.00	1.90	2.00	2.10	2.20	2.30	2.30	2.30	2.20
O	0.30	0.30	0.30	0.30	0.20	0.20	0.20	0.20	0.20	0.20	0.20
P-Q	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
R-U	0.20	0.20	0.20	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.10
AV1% Accrued Net VAT (% of GDP)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02
B	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
C	0.22	0.21	0.21	0.26	0.10	0.10	0.19	0.09	0.10	0.09	0.17
D-E	0.60	0.52	0.60	0.40	0.15	0.28	0.27	0.30	0.26	0.12	0.36
F	-0.01	-0.01	-0.01	0.02	-0.06	-0.09	-0.09	-0.12	-0.13	-0.14	-0.16
G	3.20	2.84	2.81	2.79	3.60	3.60	3.56	3.61	3.51	3.25	3.46
H	-0.01	-0.01	0.00	0.00	0.00	0.03	0.00	0.00	-0.02	-0.04	-0.04
I	0.15	0.16	0.17	0.17	0.15	0.16	0.16	0.16	0.16	0.06	0.01
J	0.53	0.54	0.52	0.51	0.54	0.55	0.54	0.56	0.57	0.57	0.58
K-L	0.36	0.48	0.48	0.52	0.55	0.41	0.41	0.42	0.41	0.43	0.46
M-N	1.34	1.72	1.66	1.68	1.30	1.30	1.38	1.40	1.38	1.29	1.42
O	0.02	0.02	0.03	0.03	0.06	0.05	0.06	0.08	0.08	0.07	0.07
P-Q	0.04	0.05	0.06	0.06	0.08	0.08	0.09	0.09	0.09	0.08	0.08
R-U	0.10	0.09	0.10	0.10	0.13	0.13	0.14	0.14	0.12	0.09	0.09
Z	0.60	0.56	0.34	0.24	0.00	0.06	0.05	0.04	0.06	0.06	0.16

Table 14. Data for Figures 4 and 19: The Compliance Gap by Sector
(In percent of GDP)

Sector	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.4	0.5	0.6	0.5	0.6	0.5	0.4	0.5	0.4	0.2	0.2
D-E	0.1	0.1	-0.3	-0.1	0.4	0.3	0.3	0.2	0.3	0.5	0.3
F	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1
G	0.1	0.6	0.6	0.7	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.0
H	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
I	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
K-L	0.0	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
M-N	0.9	0.4	0.4	0.2	0.7	0.8	0.8	0.9	0.9	1.0	0.8
O	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2
P-Q	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
R-U	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Z	-0.6	-0.6	-0.3	-0.2	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.2

Table 15. National Accounts Statistics Summary over the period 2011-2021
(Millions lcu)

Year	Gross Domestic Product	Final Consumption	GFCF	Imports	Exports
2011	375,967.80	284,201.80	86,511.60	303,768.30	303,396.10
2012	386,174.70	294,447.10	88,673.00	310,258.70	310,501.80
2013	392,880.00	301,629.50	87,113.30	308,514.90	311,649.50
2014	403,003.30	306,463.90	91,908.30	318,300.90	321,600.70
2015	416,701.40	312,334.50	95,688.90	318,306.80	324,215.70
2016	430,085.30	320,644.00	100,114.20	336,479.00	341,615.10
2017	445,050.10	331,582.80	103,601.00	365,579.40	370,203.40
2018	460,050.80	344,668.00	108,676.30	383,752.10	382,208.50
2019	478,645.00	355,916.30	116,213.90	391,408.90	394,415.70
2020	459,826.30	340,051.70	111,258.50	357,441.30	365,317.00
2021	502,311.60	366,385.20	121,497.30	431,041.10	436,322.70

Source: OECD.

Appendix II. Definitions of VAT Gap terms

Components of the VAT gap

The total VAT gap is the sum of the compliance and policy gaps, which measure revenue losses due to taxpayer non-compliance and policy reliefs respectively. The RA-GAP approach uses the same analytical model to estimate both components, which can be broken down as shown below. The components of the VAT gap are illustrated in the subsequent chart.

Overall VAT gap The difference between the potential VAT if all final consumption were taxed at the current standard rate and actual VAT revenue. The overall VAT gap is the sum of the *compliance* gap and the *policy* gap.

Compliance gap The difference between the potential VAT given the current policy framework and actual VAT revenue. The compliance gap is the sum of the *assessment* gap and the *collection* gap.

Assessment gap The difference between potential collections, given the current policy framework, and the VAT declared or assessed.

Collection gap The difference between VAT declared or assessed and actual VAT revenue collected.

Policy gap The difference between the potential VAT if all final consumption were taxed at the current standard rate and the potential VAT given the current policy framework. The policy gap is the sum of the *expenditure* gap and the *non-taxable* gap.

Expenditure gap The difference between the potential VAT where most of final consumption is taxed at the standard rate, but where a set of minimal standard exemptions are maintained, and the potential VAT given the current policy framework.

Non-taxable gap The difference between the potential VAT if all final consumption were taxed at the current standard rate and the potential VAT where most of final consumption is taxed at the standard rate, but where a set of minimal standard exemptions are maintained. Also known as the *efficiency* gap.

C-efficiency The ratio of actual VAT to potential VAT if all final consumption were taxed at the current standard rate. C-efficiency can be expressed as:

$$c - efficiency = (1 - compliance\ gap) \times (1 - policy\ gap)$$

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