



Office Memorandum

May 15, 2014

To: Members of the Executive Board

From: The Secretary

Subject: **Republic of Estonia—Technical Assistance Report—Revenue Administration Gap Analysis Program—The Value-Added Tax Gap**

Attached for the **information** of Executive Directors is a technical assistance report on the revenue administration gap analysis program—the value-added tax gap in the Republic of Estonia.

Questions may be referred to Mr. Thackray, FAD (ext. 37952).

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Fiscal Affairs Department



ESTONIA

**REPORT OF THE FINDINGS FROM THE
REVENUE ADMINISTRATION GAP ANALYSIS PROGRAM—
THE VALUE-ADDED TAX GAP IN ESTONIA**

Mick Thackray and Junji Ueda

January 2014

Mr. Thackray of the Fiscal Affairs Department (FAD) Revenue Administration Gap Program (RA-GAP) visited Estonia in May 2013, to deliver a Technical Assistance mission. During this mission, he presented the RA-GAP value-added tax (VAT) gap model to the Estonian Tax and Customs Board (ETCB), and worked with ETCB analysts, including Mr. Ivar Laur, to identify the data required for the RA-GAP model and to conduct some preliminary analysis. Mr. Laur works within the Intelligence Department of the ETCB, and produces VAT compliance gap estimates and associated analysis for their annual Basic Strategy Analysis and as part of their risk assessment process.

Between May 2013 and November, the RA-GAP Program used data provided by the ETCB and Estonian Statistical Agency to estimate the VAT compliance gap in Estonia. Mr. Thackray visited the ETCB in Tallinn, with Mr. Ueda also of the RA-GAP Program, in December. The purpose of the visit was for them, with assistance from the ETCB, to use the RA-GAP methodology to estimate the Estonian VAT compliance Gap.

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ABBREVIATIONS AND ACRONYMS

| | |
|--------|--|
| CASE | Center for Social and Economic Research (Poland) |
| EC | European Commission |
| EIER | Estonian Institute for Economic Research |
| ETCB | Estonia Tax & Customs Board |
| HMRC | Her Majesty's Revenue & Customs (UK) |
| MTIC | Missing Trader Intra-Community (fraud) |
| NPISH | Nonprofit institutions serving households |
| RA-GAP | Revenue Administration GAP Analysis Program |
| VAT | Value-added tax |
| WAR | Weighted Average Rate (of VAT) |



ESTONIA

REVENUE ADMINISTRATION GAP ANALYSIS PROGRAM

REPORT: The Value-Added Tax Gap in Estonia

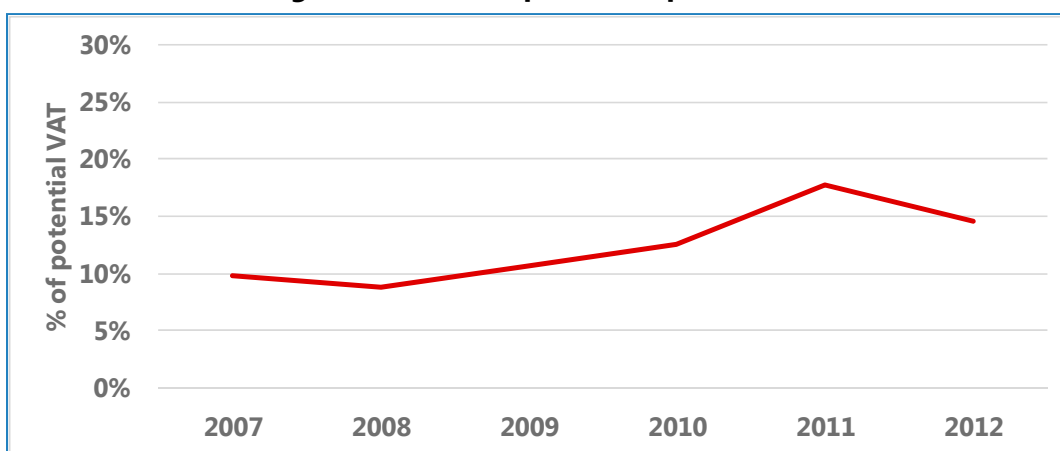
EXECUTIVE SUMMARY

This report presents the results of applying the Revenue Administration Gap Analysis Program VAT gap estimation methodology to Estonia for the period 2007–12. The methodology employs a top-down approach for estimating the potential VAT base, using statistical data on value-added generated in each sector. There are two main components to this methodology for estimating the VAT compliance gap: 1) estimate the potential net VAT collections for a given period, and 2) determine the accrued net VAT collections for that period. The difference between the two values is the compliance gap.

The Estonian Tax and Customs Board have been estimating their VAT and other tax compliance gaps since 2004. These estimates and associated compliance and risk analysis, all produced by the ETCB Intelligence Department, are used to set strategic priorities and identify risks and potential targets for tactical operations.

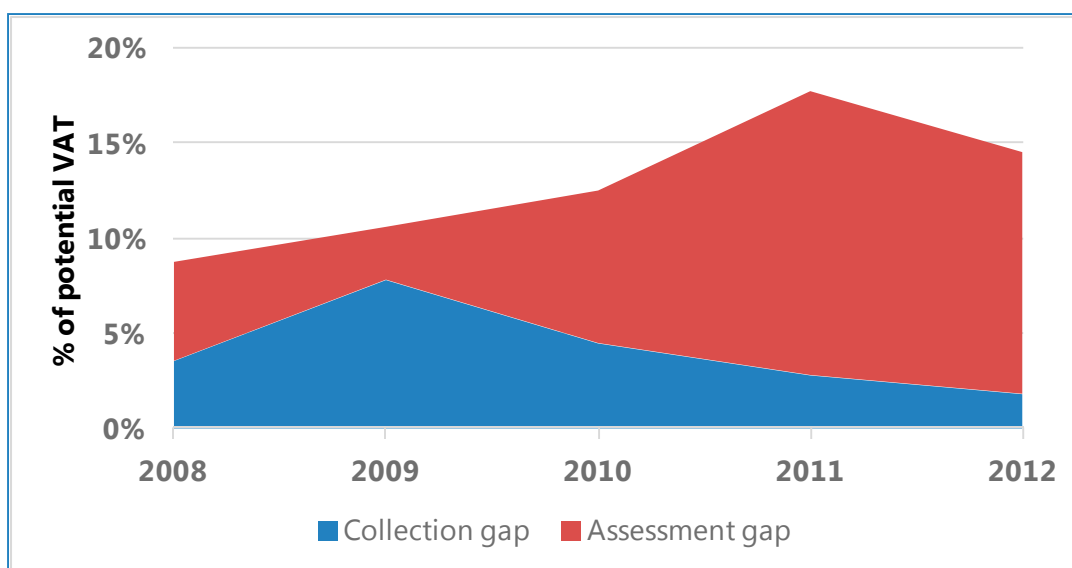
Between 2009 and 2012, VAT receipts failed to keep pace with nominal GDP and final consumption growth, due to a growing compliance gap. This is observed in VAT compliance gap estimates produced by RA-GAP, Center for Social and Economic Research (CASE),¹ and the ETCB. In particular, over the period 2008–11, the VAT compliance gap almost doubled and losses increased by over €150 million (Figure 1).

¹ "Study to quantify and analyse the VAT Gap in the EU-27 Member States" Final Report TAXUD/2012/DE/316 for the European Commission, TAXUD, by CASE – Center for Social and Economic Research (Project leader) and CPB Netherlands Bureau for Economic Policy Analysis (Consortium leader).

Figure 1. VAT Compliance Gap, 2007–12

Source: Staff estimates.

Within the overall VAT compliance gap, the assessment gap in Estonia increased from 2009–11, while the collections gap grew until 2009² and then decreased (Figure 2). The decrease of collections gap followed the introduction of automated management and sanctions of debt in 2010. The level is now low by international standards.

Figure 2. Compliance, Assessment, and Collection Gaps, 2008–10

Source: staff estimates.

² ETCB implemented a major change to their accounting in 2009, and their handling of excess credit returns. Although the accruals method used by RA-GAP should take into account much of the disruption from these changes, it is possible that some timing effects remain in the data and the 2009 collections gap is over-stated (which would mean that the assessment gap is under-stated).

The VAT compliance gap is by far the largest tax gap in Estonia, and ETCB tax gap analysis indicates that Missing Trader Intra-Community (MTIC) frauds are the largest contributor to the VAT compliance gap. ETCB produce a comprehensive tax gap analysis for their annual Basic Strategy Analysis covering most of the principal taxes in Estonia. The strategic priority for ETCB enforcement and compliance is to identify and prevent MTIC frauds, with improved to customer service to minimize compliance burdens for compliant businesses.

Observations and possible follow-up action

ETCB's approach of using comprehensive tax gap analysis to inform both strategic and tactical decisions represents very good practice. Their analysis is fit for purpose in this regard. However, there are ways by which they could improve and extend their analysis, as follows:

- Use of RA-GAP's preferred VAT gap model for potential VAT and accrued collections, to improve the reliability of VAT compliance gap estimates, and in particular their estimated year-on-year changes
- Micro-level analysis of trends in VAT declarations and adjustments to monitor potential risks of taxpayer manipulation to avoid automated debt management and credit risk assessment
- Increased use of longitudinal data analysis in risk profiles to monitor potential risks of ETCB's increasing reliance of automated tax administration processes
- Annual publication of (nonoperationally sensitive) ETCB tax gap estimates, to facilitate their use in public debate on the relative scale of tax compliance losses and appropriate counter-measures
- In the absence of sufficient quantitative data for a dividend tax gap estimate, ETCB might consider qualitative research in the form of a structured conversation with tax experts to determine the likely scale of this tax gap.

I. BACKGROUND

1. **The IMF RA-GAP program.** The RA-GAP Program, conducted by the Fiscal Affairs Department's Revenue Administration Divisions, provides revenue administrations with an estimate and quantitative analysis of the gap between potential and actual collections, referred to as the compliance gap. The RA-GAP program aims to provide an evaluation of the overall compliance gap for a specific tax, and a breakdown by economic sectors of this gap, to help revenue administrations monitor and identify what is contributing to this gap.³

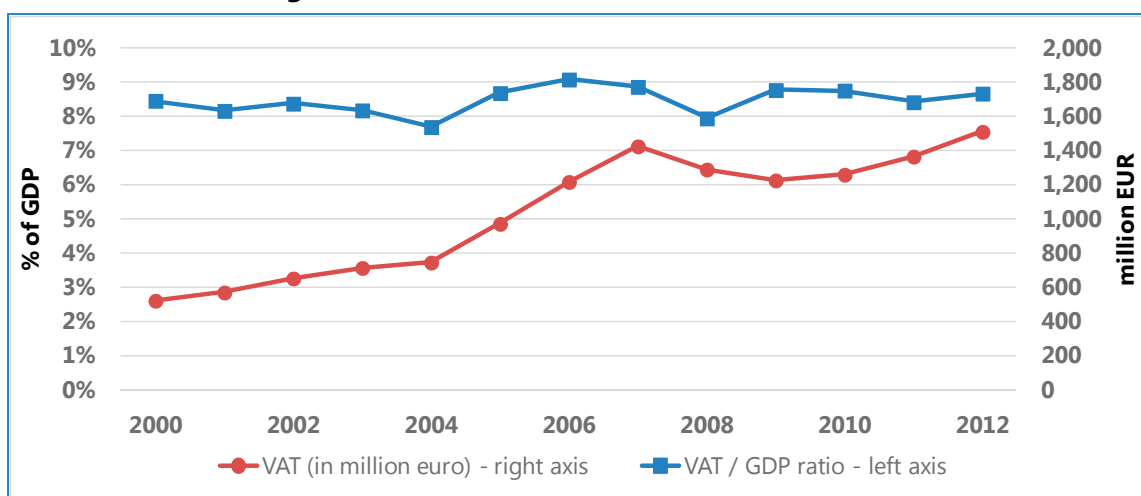
2. **In Estonia, tax gap analysis has been conducted by the ETCB from 2004, including VAT, and is used for strategic risk assessment to improve administrative efficiency and effectiveness.** ETCB recognizes the necessity to test its model for tax gap analysis by referring to RA-GAP approach, since its VAT gap analysis has been based on a simplified consumption base approach. The main purposes of this report are to:

1. provide estimates of the VAT compliance gap in Estonia using the RA-GAP approach;
2. review the ETCB's analysis methodology and results; and
3. review the ETCB's use of tax gap analysis in risk assessment and their annual Basic Strategy Analysis exercise.

A. Value-Added Tax Revenue Performance

3. **VAT revenues measured as a percent of GDP in Estonia have been between 8 percent and 9 percent since 2000.** Until 2007, nominal revenues increased, but during the recession in 2008 and 2009, receipts decreased (Figure 3). In 2009, the reduced VAT rate for medicines and other products was increased from 5 percent to 9 percent in January, and the standard rate was increased from 18 percent to 20 percent in July. Reflecting both the changes in VAT legislation and recent economic growth, nominal revenues have been increasing after 2009, while the ratio to GDP has been either level or slightly declining.

³ The model and methodology used in assessing the VAT gap are detailed in Appendix I.

Figure 3. Value-Added Tax Revenues, 2000–12

Source: Eurostat.

4. **Between 2009 and 2012, nominal GDP and final consumption grew by 25 percent, but actual collections⁴ increased by 23 percent and declarations by just 16 percent.** Potential VAT revenue would be expected to grow by more than GDP and final consumption, reflecting the increase of statutory rates in 2009. However, actual VAT collections data by Eurostat increased by just 23 percent (from €1,224 million to €1,508 million), and declared VAT increased by only 16 percent (from €1,336 million to €1,551 million). This discrepancy between the trends of overall economic activities and VAT revenues indicates that there has been a likely expansion in the overall compliance gap in VAT.

5. **ETCB monitoring and analysis indicates strongly that the putative widening of the compliance gap is likely due to increasing MTIC fraud.** This particular form of VAT repayment fraud is endemic within EU member states, generally committed by organised criminal gangs. ETCB's internal intelligence and bottom-up tax gap analysis (below) that MTIC frauds have increased toward 2011 provides evidence of this.

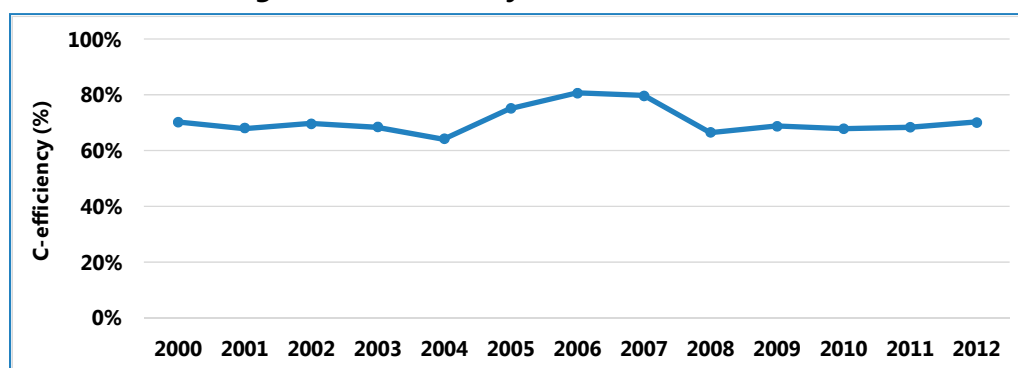
6. **This report focuses on the VAT gap during the period between 2007 and 2012.** Results from RA-GAP preferred VAT gap approach will be used to estimate the VAT compliance gap for Estonia, and compared with other estimates.

⁴ As reported in Eurostat (see below for a discussion of receipts reporting).

7. **C-efficiency provides a more relevant measure of the generation of VAT in relation to economic aggregates than the simple ratio of receipts to GDP.** VAT is a tax on final consumption, and final consumption by households is generally the largest part of the tax base for VAT; so, in principle, a movement in VAT receipts as a share of GDP could be explained by a change in the standard VAT rates and the relative share of final consumption to GDP. The c-efficiency measure is used to control for such effects. But other components of expenditure, such as intermediate consumption by government and exempt industries also contribute to net VAT receipts and consequently c-efficiency measure.

8. **C-efficiency in Estonia is generally higher than the EU average due to the broad coverage of its VAT, with limited reduced rates and exemptions.**⁵ The increase in the c-efficiency ratio between 2005 and 2007 (Figure 4) reflects the expanding VAT revenues relative to final consumption. This is due to the relative increases in gross fixed capital formation by exempted sectors in economic booms.⁶ After 2008, the c-efficiency ratio decreased and stayed at about the same level, even though gross fixed capital formation has been increasing recently.

Figure 4. C-Efficiency for Estonia, 2002–12



Sources: Eurostat; and staff calculations.

⁵ Commonly used as a measure of the efficiency of VAT revenue mobilisation for a given country's economic level and composition, c-efficiency is defined as the ratio of VAT receipts to final consumption, divided by the main VAT rate. It provides a more relevant measure of the generation of VAT in relation to economic aggregates than the simple ratio of receipts to GDP because VAT is a tax on final consumption, and final consumption by households is generally the largest part of the tax base for VAT; so, in principle, a movement in VAT receipts as a share of GDP could be explained by a change in the standard VAT rates and the relative share of final consumption to GDP. The c-efficiency measure is used to control for such effects. But other components of expenditure, such as intermediate consumption by government and exempt industries also contribute to net VAT receipts and consequently c-efficiency measure.

⁶ VAT charged on inputs to exempt sectors (their intermediate consumption) is generally not recoverable as input tax credits, and so represents net VAT receipts due.

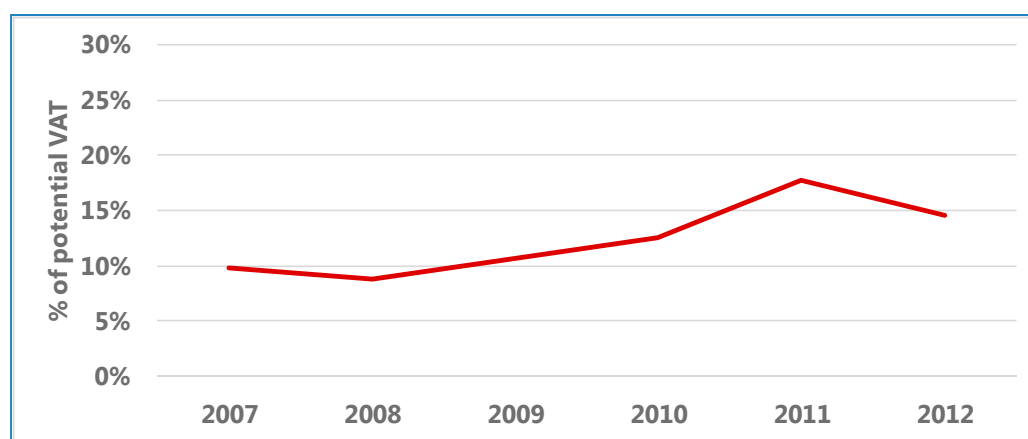
II. ESTIMATION AND EVALUATION OF THE VALUE-ADDED TAX GAP

9. **Estimating the VAT compliance gap.** The VAT compliance gap for a particular year is the difference between revenues actually collected and the potential revenues that could have been collected given the policy framework that was in place during that year. The RA-GAP approach was used to estimate the compliance gap for the years 2007 to 2012 in this report. The potential VAT revenues were estimated using detailed national accounts data published by the Estonian national statistics agency for the period 2007 to 2009, when supply and use tables are available. These estimates were extrapolated to 2012 using the published value added growth numbers for each sector. For VAT actual collections, tax returns data between 2007 and 2012 provided by ETCB to RA-GAP was used to calculate collections on an accruals basis as at May 2013.⁷

A. The Value-Added Tax Compliance Gap in Estonia

10. **The estimated VAT compliance gap for Estonia increased over the period 2007–12, particularly in the period 2008–11 (Figure 5).** The compliance gap as measured at May 2013 shows a trend increase over the period 2007–12. In the period 2008 to 2011, the compliance gap rose by nearly 10 percentage points, almost doubling in size.

Figure 5. VAT Compliance Gap, 2007–12



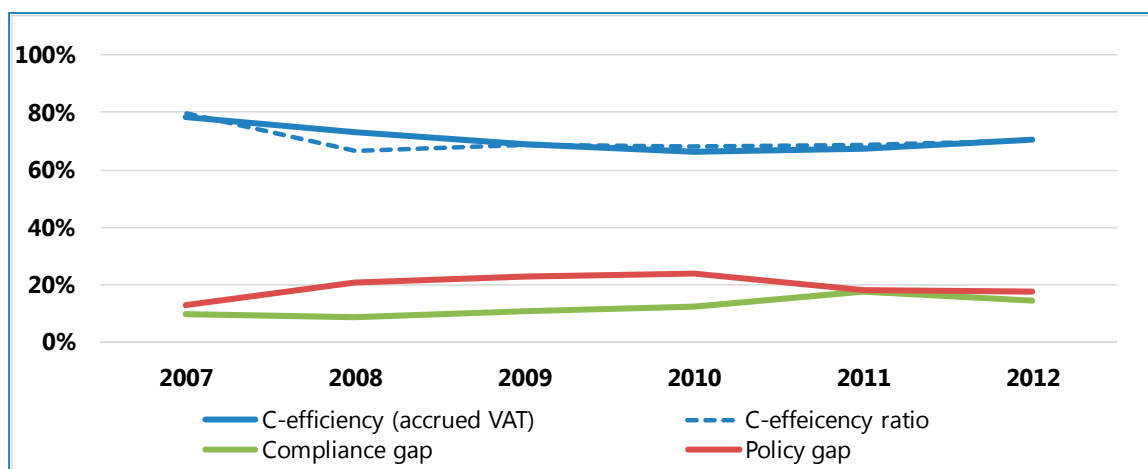
Source: Staff estimates.

⁷ This date was determined by the timing of the data extract for VAT returns and payments used in the RA-GAP model to determine accrued collections.

B. The Compliance Gap Compared to C-Efficiency

11. **The declining trend in the c-efficiency ratio over the period 2007–12 can be largely explained by changes in the compliance gap.** A decomposition of c-efficiency into compliance and policy gaps shows a relatively constant policy gap over the period between 2007 and 2012, while the compliance gap has been increasing so that it is now approaching the level of policy gap (Figure 6).

Figure 6. Policy and Compliance Gaps, 2007–12



Sources: Eurostat; and staff estimates.

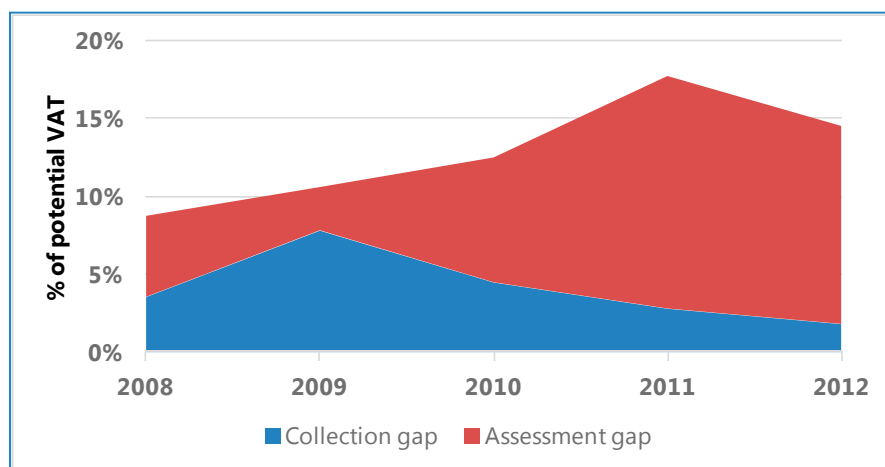
C. The Assessment and Collection Gaps

12. **The compliance gap can be decomposed into two portions, an assessment gap and a collections gap.** The collections gap is the difference between the actual VAT and the total amount of VAT declared or assessed as due from taxpayers, while the assessment gap is the difference between the amount of VAT declared or assessed and the potential VAT. Sometimes these two gaps are referred to as the identified portion of the compliance gap (the collections gap) and the unidentified portion (the assessment gap).⁸

⁸ 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.

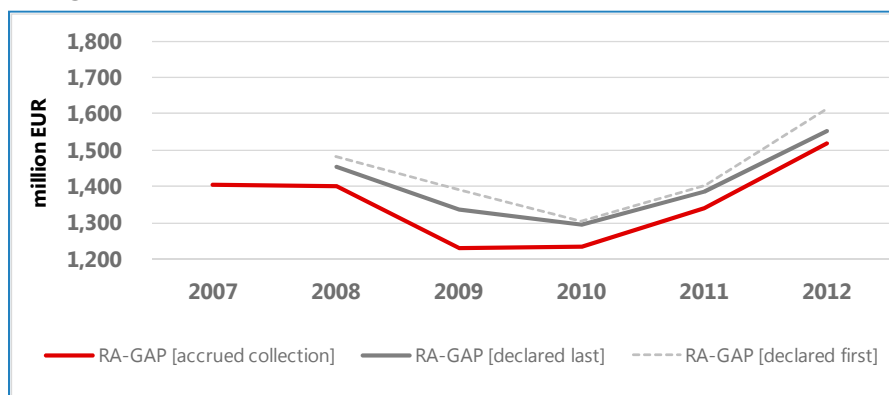
13. **The assessment gap in Estonia increased from 2009–11, while the collections gap grew until 2009⁹ and then decreased (Figure 7).** The decrease of collections gap means that the differences between declared VAT and collected VAT have become narrower, ie that new debt arising on returns and assessments has been getting smaller year by year (Figure 8). The reduction of collections gap followed the introduction of automated management and sanctions of debt in 2010.

Figure 7. Compliance, Assessment and Collection Gaps, 2008–12



Source: Staff estimates.

Figure 8. Declared and Collected Value-Added Tax, 2008–12



Sources: Estonian Tax and Customs Board data; and RA-GAP staff calculations.

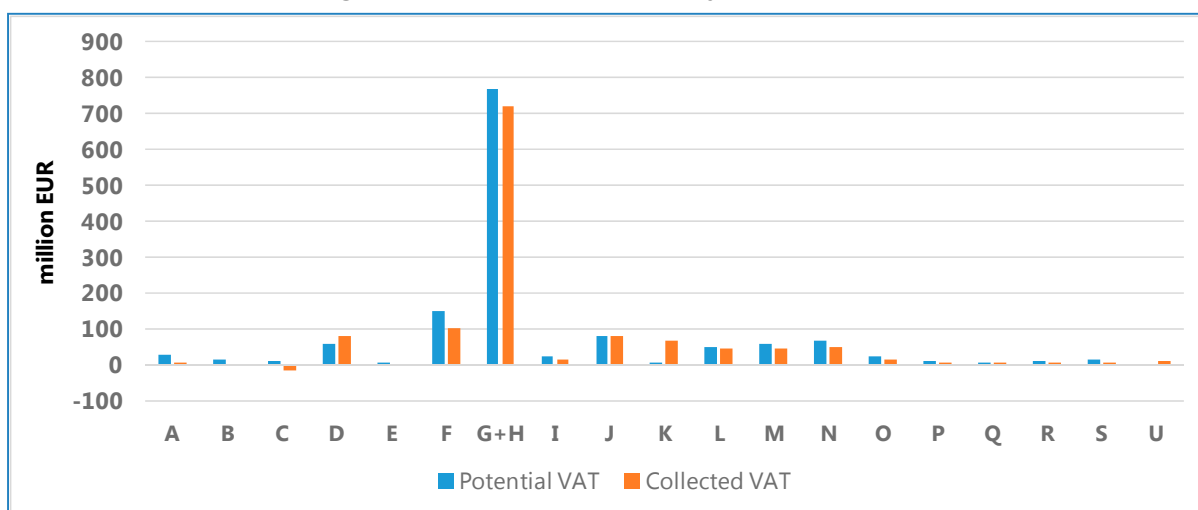
⁹ ETCB implemented major changes to their accounting in 2009, and to their handling of excess credit returns. Although the accruals method used by RA-GAP should take into account much of the disruption from these changes, it is possible that some timing effects remain in the data and the 2009 collections gap is over-stated (which would mean that the assessment gap is under-stated).

D. The Compliance Gap by Sector

14. **The distribution of the VAT base between industrial sectors is very much skewed in Estonia.** Over 60 percent of VAT is collected in the wholesale and retail sector. This is remarkably concentrated, and reflects a large share of imported goods in final consumption in the Estonian economy.

15. **The sectors identified by the RA-GAP model as having significant compliance gaps accord with ETCB risk assessments.** The absolute values of compliance gaps are larger in the Agriculture, Forestry and Fishery (sector A), Construction (sector F), Wholesale, Retail and Transportation Services (sector G and H) and Professional Services (M) sectors. These sectors also appear to be the major positive contributors to the overall compliance gap in 2009 (Figure 9). It has been confirmed that this assessment fits closely to ETCB's own assessment, using bottom-up analysis and risk assessment.

Figure 9. Compliance Gaps by Sector, 2009

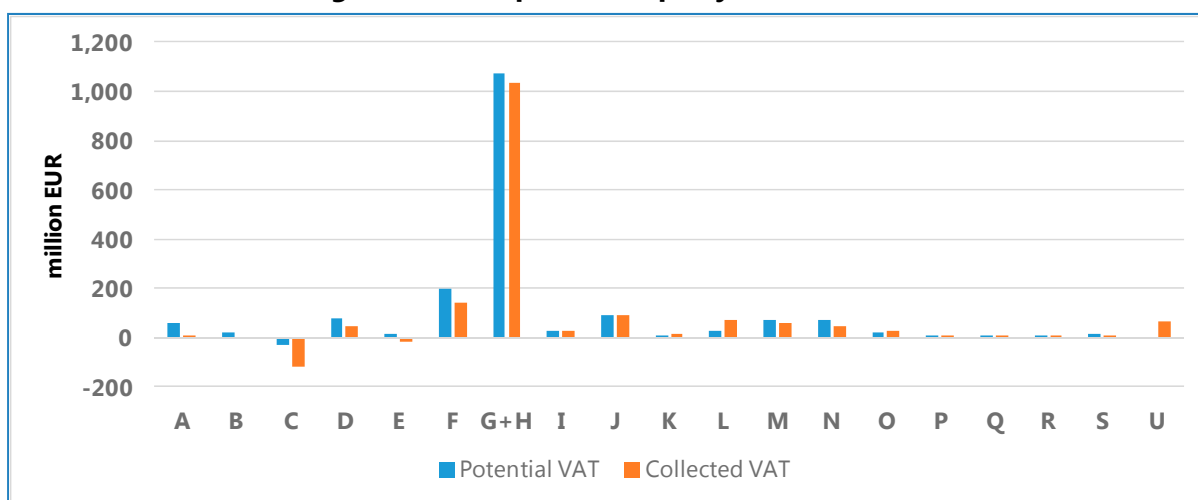


| | | | |
|----------|--|----------|---|
| A | Agriculture, forestry and fishing | K | Financial and insurance activities |
| B | Mining and quarrying | L | Real estate activities |
| C | Manufacturing | M | Professional, scientific and technical activities |
| D | Electricity, gas, steam and air conditioning supply | N | Administrative and support service activities |
| E | Water supply, sewerage, waste management and remediation activities | O | Public administration and defence; compulsory social security |
| F | Construction | P | Education |
| G | Wholesale and retail trade; repair of motor vehicles and motorcycles | Q | Human health and social work activities |
| H | Transportation and storage | R | Arts, entertainment and recreation |
| I | Accommodation and food service activities | S | Other service activities |
| J | Information and communication | U | Unknown |

Source: Staff estimates.

16. **The size of compliance gaps by sector in 2012 was similar to 2009 (Figure 10).** The difference between 2009 and 2012 estimates is largest in the Manufacturing Sector (C). This may indicate behavioral changes in the sector, or changes in the relative size of exported products to value added produced in the sector (which possibly results in overestimates of potential VAT). Since the potential VAT numbers in 2012 are estimated based on the assumption that the ratio of potential VAT to value added is constant through time, it is worth clarifying them using detailed data.

Figure 10. Compliance Gaps by Sector, 2012

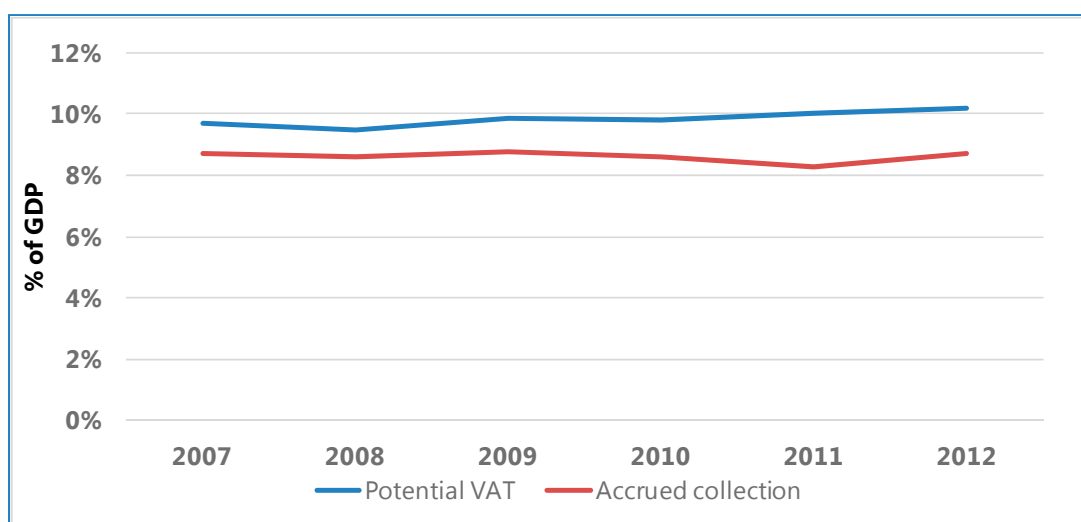


| | | | |
|----------|--|----------|---|
| A | Agriculture, forestry and fishing | K | Financial and insurance activities |
| B | Mining and quarrying | L | Real estate activities |
| C | Manufacturing | M | Professional, scientific and technical activities |
| D | Electricity, gas, steam and air conditioning supply | N | Administrative and support service activities |
| E | Water supply, sewerage, waste management and remediation activities | O | Public administration and defence; compulsory social security |
| F | Construction | P | Education |
| G | Wholesale and retail trade; repair of motor vehicles and motorcycles | Q | Human health and social work activities |
| H | Transportation and storage | R | Arts, entertainment and recreation |
| I | Accommodation and food service activities | S | Other service activities |
| J | Information and communication | U | Unknown |

Source: Staff estimates.

E. Changes in the Potential Value-Added Tax and the Actual Value-Added Tax

17. **The increase in the compliance gap after 2009 in Estonia is the result of relatively weak growth of actual VAT receipts compared to potential VAT growth.** The actual VAT, as a percentage of GDP, fell from 2009 to 2011, while the potential VAT slightly increased (Figure 11).

Figure 11. Potential and Actual Value-Added Tax, 2007–12

Source: Staff estimates.

Potential value-added tax

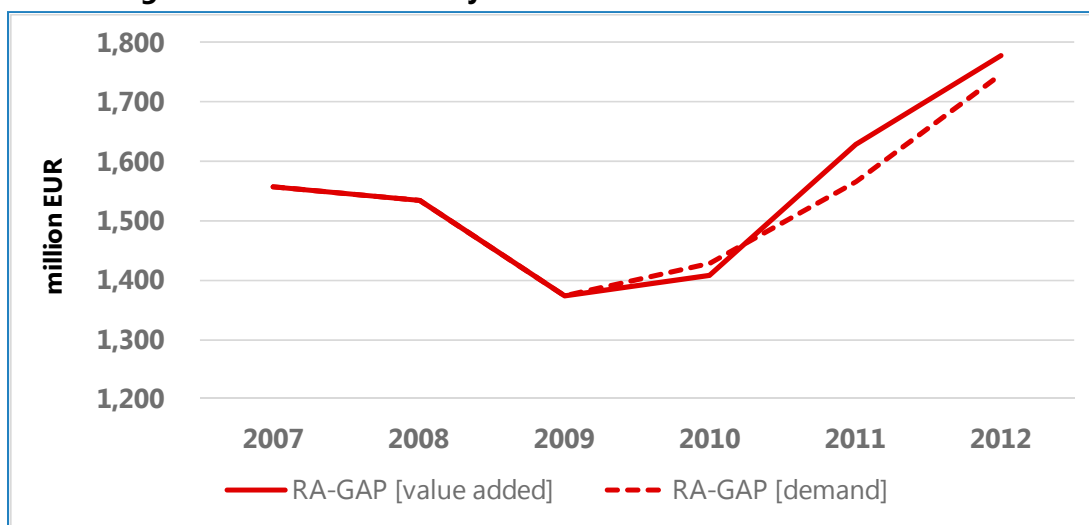
18. **The wholesale and retail sector and construction sector contributed most to the growth of potential VAT during the period.** This was because of their high growth rates and relatively large ratios of potential VAT to value added produced. Changes in potential VAT come either from changes in the economic tax base or from changes in the policy structure.¹⁰ In this case it would appear that economic forces were the primary driver behind the increase.

19. **Potential VAT revenues after 2009 are estimated by using the growth rates of value-added in each sector.** The use of forecast projections for years after 2009 is inevitable if the VAT compliance gap is to be estimated for these years, because detailed supply-use tables are not available for those later years. Potential VAT revenues might alternatively be estimated using the growth rate of demand components. The implicit assumption for this approach is that the ratio of VAT to components such as the final consumption expenditure of households and gross fixed capital formation of government and exempted sectors are stable through time. The results based on the alternative approach indicate that the growth of potential VAT is lower than when using the value added approach but the two series do converge toward 2012 (Figure 12), which confirms the

¹⁰ Potential VAT for each year is estimated by applying the statutory policy structures for those years to economic data on each sector's purchases and sales; a macroeconomic reproduction of how the VAT actually operates at the taxpayer level. A full description of the model used is provided in Appendix I (below).

strong growth of potential VAT revenues after 2009. The residual differences between the results from the two forecast methods do show that the choice of forecast method can affect the final result. In principle, the value-added method should give more reliable results at the sector level, but could miss the impact of changes to the proportion of economic activity represented by imports and exports (which the demand method would pick up). On balance, the theoretical advantages of the value added method, and its consistency with the general RA-GAP approach, were felt to outweigh the advantages of the demand-led approach.

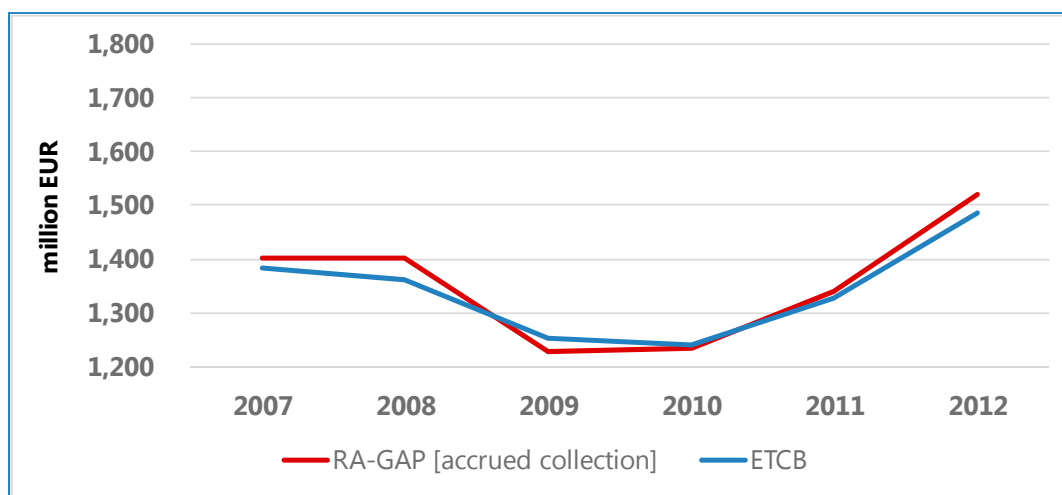
Figure 12. Alternative Projections of Potential Value-Added Tax



Source: Staff estimates.

Actual value-added tax

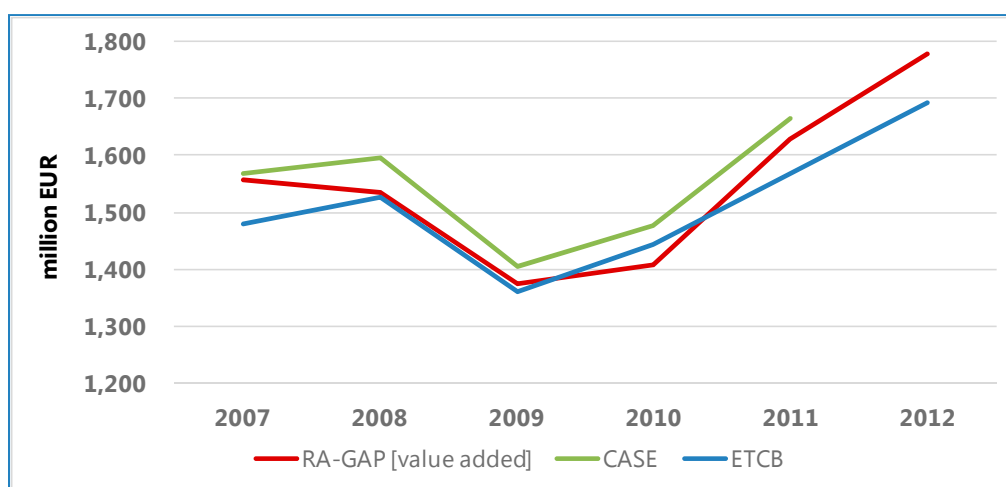
20. **Comparison of the cash-based VAT revenues provided by ETCB to the accrued collections indicates that in the 2008 recession, taxpayers delayed cash payments, which reduced cash receipts and accumulated debt (Figure 13).** In addition, taxpayers ran down their excess credit carry forward balances, using them to pay current liabilities, which will also have reduced cash—as opposed to accrued—collections. The RA-GAP approach to tax collections data is to reallocate receipts from the date on which they are paid to the periods for which they are paid. That is, the RA-GAP approach is measure accrued collections rather than cash receipts. In the long-run, cash values for revenue should average out with the accrued values (ignoring penalties and interest), but the cash values have shown a higher volatility as compared to the economic activities to which the RA-GAP collections are tied. This may make it difficult to capture the underlying trends of compliance gaps if they are calculated on a cash basis.

Figure 13. Accrued and Cash Collections, 2007–12

Sources: Estonia Tax and Customs Board; and staff estimates.

F. Comparison of RA-GAP Results with Other Measures

21. **RA-GAP estimates of potential VAT are generally consistent with estimates produced by ETCB and CASE (Figure 14).** This is to be expected because all models are based on the same national accounts data, which has been balanced to ensure consistency between the various versions of GDP.

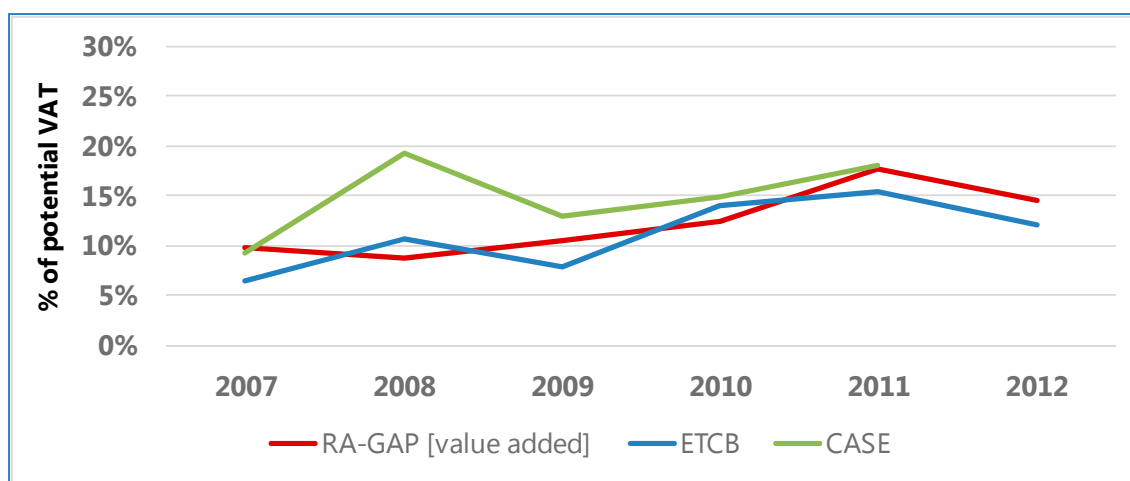
Figure 14. Potential Value-Added Tax, 2007–12

Source: Country authorities; Center for Social and Economic Research; and staff calculations.

22. **RA-GAP estimates of the compliance gap from 2007–09 are smoother than ETCB and CASE estimates, because the latter use cash collections that distort the**

underlying compliance trend. Because the compliance gap is the difference between two large numbers (potential VAT and actual collections) apparently small differences between those numbers are magnified in the VAT compliance gap estimates from the three sources. In particular the ETCB and CASE VAT gap estimates are more volatile year by year than RA-GAP equivalents (Figure 15), especially in the period 2007–09. Mainly, this difference in the volatility is a consequence of the timing effects in the cash receipts series used by ETCB and CASE (above), which will have distorted the underlying trend in the compliance gap.

Figure 15. Value-Added Tax Gap Estimates, 2007–12



Sources: Country authorities; Center for Social and Economic Research; and staff calculations.

23. The simplified VAT gap model used by ETCB may cause modeling differences between estimated potential VAT and the real potential VAT from economic activities.

The ETCB model simplifies the tax base for VAT in Estonia, by calculating the potential VAT revenues on final consumption by households and nonprofit institutions serving households (NPISH) from national accounts data from the Weighted Average Rate (WAR) of VAT calculated by the Estonian national statistics agency.¹¹ The results of this method may cause deviations from potential VAT revenues reflecting economic activities for the following reasons:

¹¹ The Weighted Average Rate of VAT (WAR) is a harmonised (and heavily stylized) calculation of EU member states' respective VAT bases, estimated by all member states as part of their Own Resources accounts for contributions to the EC.

1. **Inconsistency between tax base and applied (average) tax rate.** WAR values are calculated in accordance with a detailed classification of tax base activities, including intermediate consumption and gross fixed capital formation by exempt sectors, and excluding final consumption exempted from VAT. Applying the WAR value to all final consumption by households and NPISH without considering intermediate consumption and gross fixed capital formation in exempt sectors leads to biases in both directions in the VAT gap estimates.
 2. **Timing issue.** The WAR for year X is calculated using VAT rates for year X applied to expenditure patterns for year X-2. During times of economic stability, to use WAR for year X as a proxy of the effective VAT rate applied to the calculated tax base in year X may be a reasonable approach, holding the composition of spending constant over a two year lag period. However, during times of rapid economic change when the composition is likely to change, this approach will likely bias the estimate of potential VAT.
 3. **Use of purchasers' prices and basic prices.** ETCB uses final consumption at purchasers' prices, which include VAT. However, the calculation the VAT base should exclude VAT, and its inclusion will give an upward bias to the results.
24. **The net effect of these opposing biases appears to have been relatively neutral for 2007–09.** This provides some support for the current practice of using ETCB VAT gap model to provide strategic risk assessments, in that it produces reasonable estimates of the overall scale of the compliance gap. However, because the biases noted above are not quantified, they increase the uncertainty in the final estimates, particularly in assessing year on year changes.

III. EXISTING TAX GAP ANALYSIS FOR ESTONIA

A. Use of Tax Gap Analysis in the Estonian Tax and Customs Board

25. **In Estonia, the authorities produce comprehensive tax gap analysis within the ETCB.** The Intelligence Department of the ETCB is responsible for producing and compiling estimates not only of the VAT compliance gap, but of the compliance gaps for other Heads of Duty that the ETCB administer. Appendix II contains descriptions of the methods used by ETCB to estimate Estonian tax gaps. Appendix III briefly details current risk assessments for each tax. This analysis underpins ETCB's risk management, being used not only to determine

strategic priorities but to improve and measure operational performance. In addition it is used in ETCB's fiscal monitoring, working closely with the Ministry of Finance.

26. **Analyses of the various tax gaps in Estonia are part of ETCB's annual Basic Strategy Analysis exercise.** In December each year, ETCB reviews its strategic priorities and determines business plans and performance targets for the coming year. The Intelligence Department's tax gap analysis forms a central part of this analysis, presenting the relative scale and trends of compliance gaps for the different taxes, allowing ETCB to optimize their resource allocation in terms of tax gap closure.

27. **Tax gap analysis is used to determine operational targets for ETCB.** The Intelligence Department uses bottom-up tax gap analysis and risk assessments expressed in tax gap terms to identify targets by behavior and by individual taxpayer. For example, companies declaring nonviable value-added margins are deemed to be at risk of VAT evasion and referred for further investigation by audit teams. Similarly, ETCB are making increasing use of 'soft interventions,' for example education visits and pre-return audits, the effectiveness of which is evaluated in tax gap terms.

28. **The performance of ETCB officials is evaluated by observed tax gap closure.** The performance of operational teams is measured in tax gap terms—i.e., outcomes rather than inputs (for example, audit resources) or outputs (for example, number of interventions and assessments). When interventions have been made, the operational teams evaluate their performance by monitoring the tax receipts from the businesses concerned over the following year compared to a matching control group of businesses that did not have any such intervention. In principle, this allows the ETCB to express results not just as direct additional revenue yield but as revenue losses prevented by indirect deterrence and prevention effects. Because such evaluation is necessarily lagged, audit teams also use direct yield measures as a leading indicator of their effectiveness.

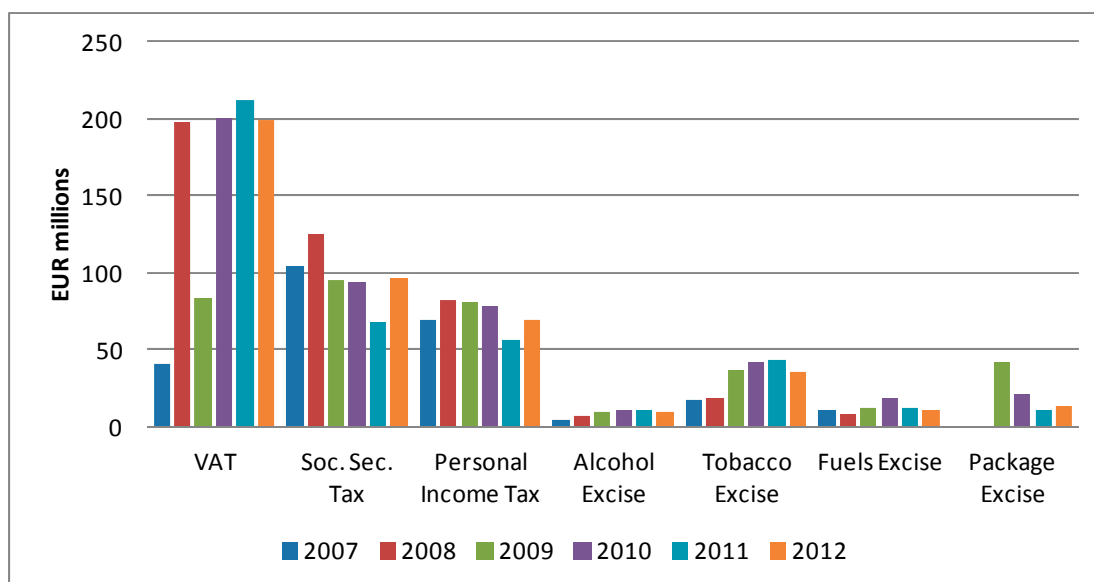
29. **ETCB tax gap estimates are used freely in public in Estonia.** Although there is no formal publication of ETCB tax gap analysis as is the case for some other tax administrations (for example, Her Majesty Revenue and Customs (HMRC) in the United Kingdom, Australian Tax Office, and the Internal Revenue Services in the United States), the results are made freely available. In particular, they are used by the authorities to frame the debate on tax administration, which currently has a high profile in Estonia due to their need to maintain an appropriate fiscal balance. The results are most often quoted when new counter-measures

against major compliance threats are proposed or implemented by the Estonian government.¹²

B. Basic Strategy Analysis 2013

30. **The 2013 Basic Strategy Analysis contained estimates of compliance gaps for the period 2007–12.** The 2013 Basic Strategy Analysis exercise was completed at the beginning of December 2013, containing tax gap estimates for the principal taxes in Estonia for the period 2007–12. Figure 16 shows the amounts of estimated losses. In terms of the amount of tax lost, the VAT compliance gap is by far the largest compliance gap in Estonia, by ETCB's assessment accounting for about euros (EUR) 200 million of total tax gap losses of €433 million in 2012, i.e., almost half of the overall tax gap.

Figure 16. Estonia Tax and Customs Board Estimated Tax Gaps 2007–12



Source: Country authorities.

¹² A striking contemporary example is the current government proposal to introduce the mandatory filing of detailed lists of transactions leading to input tax credits by VAT taxpayers in Estonia. There are fears that this could be excessively burdensome for legitimate businesses, but the government argues that the measure is required and proportionate given the estimated scale of MTIC fraud in Estonia.

IV. FURTHER WORK REQUIRED

31. **Given the scale of the estimated compliance gap, complementary ‘bottom-up’ tax gap analysis is appropriate, and should continue.** The ETCB Intelligence Department is already investing considerable analytical resources to monitoring the highest risk taxpayers, and to identifying new risks whether through the risk assessment of VAT credit returns or the identification of anomalous sub-groups within the taxpayer population.

32. **ETCB assess the ongoing threat and level of organized MTIC repayment fraud as by far the largest compliance risk, having caused very significant past losses; and further counter measures are appropriate.** ETCB tax gap analysis, focused on assisting the authorities in identifying and dealing with MTIC fraud, suggests that counter-measures implemented since 2011 have been successful in reducing the level of MTIC losses. This conclusion is supported by the top-down estimates of the Estonian VAT gap by ETCB and RA-GAP. However, MTIC is endemic within European VAT regimes, and Estonia’s extensive international trade and the structure of its economy render it especially attractive to organized MTIC fraudsters, and so further counter measures will be necessary (and are in the process of being introduced by the authorities (below)).

33. **The very low level of the collection gap in Estonia creates potential compliance risks that should be monitored.** The collection gap in Estonia was already low—around 2–3 percent of net VAT receipts—when automated debt management and late payment sanctions were introduced in 2010. These measures have reduced the collection gap even further so that it is now extremely low. Although this in itself is no bad thing, it does introduce two potential compliance risks:

- The current very low levels of new debt may be a reflection of overly burdensome sanctions that are distorting business cash flow decisions.
- Currently, taxpayers may avoid some of the sanctions by not filing their returns until they can afford to pay, or even by filing nil returns, and then filing adjusted returns when they have the cash flow to meet their obligations. This perverse incentive could lead to lower filing compliance as taxpayers ‘game’ the system, or even perhaps to lower receipts if taxpayers file lower returns and then fail to file the necessary adjustments until they are caught by audit or other intervention.

34. **There is not yet evidence of large scale abuse of filing and enforcement processes, but the risk should be monitored.** The ETCB have also introduced simplified processes for taxpayers to follow to manage their tax payments when they are experiencing problems with cash flow. Notwithstanding this, the authorities are aware of an increase in the filing of zero-returns, which may be an early indication of the filing risk crystallizing. They therefore need to introduce periodic monitoring of the risk by analyzing emerging patterns of filing behavior, particularly if taxpayers begin regularly to adjust previously filed returns upwards (see also below).

35. **RA-GAP analysis of detailed VAT returns showed that, in aggregate, most recent versions of returns show a systematic reduction of VAT liabilities relative to the originally filed returns.** (In Estonia, all corrections and assessments against declared liabilities are shown in taxpayer records as adjustments to filed returns.) This is an unusual finding. Generally subsequent adjustments to filed returns tend to increase liabilities, as a consequence of audit or other revenue authority interventions. ETCB have uncovered cases in which taxpayers gradually reduce their liabilities (or increase their credit claims) by a series of relatively small individual adjustments. This deliberate ‘salami-slicing’ of credit adjustments is believed to represent attempts by taxpayers to avoid audits that would be triggered by ETCB’s risk profiles if they made the credit claim in a single amount.

36. **There is not yet evidence of large scale attempts to get round risk profiling through ‘salami slicing’ VAT credits,¹³ but the risk needs to be monitored.** As above, ETCB is aware of this potential risk, and periodic monitoring of it through the analysis of taxpayer adjustments needs to be introduced.

37. **Tax gap analysis and risk analysis of taxpayer returns and adjustments needs to be carried out on the micro returns data.** The filing and enforcement risks noted above will have opposing effects on the overall level and direction of adjustments to returns. The first risk is that taxpayers declare less tax than is due, and then adjust their returns upwards to the true liability when their cash flow allows it. The second is that taxpayers will persistently reduce their declared tax liability (perhaps to the point where net credits become due) for one or more tax periods, so as to avoid risk profiling. The analysis therefore

¹³ This refers to the practice of avoid an audit of a VAT credit return or adjustment by deliberately disaggregating it into several, individually much smaller, credit claims or adjustments, typically all submitted (online) in a short time period. The assumption being made is that each individual claim or adjustment will be too small to trigger risk profile thresholds, and the thresholds are not applied to cumulative changes.

needs to examine the distribution of such adjustments over time, so as to identify taxpayers persistently adjusting their liabilities up or down, and extreme cases.

38. **ETCB's increasing reliance on e-filing and more automated payment and administration processes increases the need for sophisticated risk profiling and assessment techniques.** In general, the use of e-filing and more automated, on-line processes is recommended to tax administrations as a means of increasing both efficiency and customer service standards. However, such systems do increase the risk that taxpayers who are determined to evade or defraud tax will seek to avoid authorities' attention by filing returns that are manipulated to be just within risk profile parameters or even to meet benchmarked norms exactly. ETCB will need to review periodically their micro-level returns data to look for signs of such manipulation of declarations—for example, bunching of returns around risk profile boundaries or too precise matching to benchmarks. They should also extend their risk profiles to include longitudinal analyses of persistent behavior patterns.

39. **ETCB have the capacity to use quantitative analytical techniques to further improve their risk profiles and assessments.** The authority has the advantage of high quality analytical data for taxpayer returns and adjustments, and quantitative analysts with the necessary skills and experience to conduct distributional analyses of the data.

40. **ETCB should consider refining its VAT gap model to reduce the potential impact of its simplifying assumptions on estimated year-on-year changes to the gap.** As a risk assessment of the overall level of the compliance gap and means of identifying major changes, the current VAT gap model used by ETCB fulfills its functions in that it provides a reasonable assessment of the level of the gap. It also has the advantage of being relatively quick and simple to calculate. However, the simplified structure of the model¹⁴ means that it implicitly assumes a constant relationship between the relative contributions of individual components of the VAT base to each other over time. In times of economic change, this assumption is unsafe and can distort the results. The ETCB method also measures collections on a cash basis, which creates the risk of timing effects distorting the time series.

41. **The RA-GAP approach to estimating the VAT gap would improve both the reliability of ETCB's top-down VAT gap analysis and its diagnostic power.** The RA-GAP model is more complex and requires more analytical resources to calculate than ETCB's

¹⁴ This is discussed further in Appendix II (below).

current VAT gap model. However, because it mimics the VAT chains leading to final consumption, it enables the overall gap to be decomposed to individual industrial sectors, which improves its diagnostic power. The comparison between the Statistical Board's estimates of economic activities used in RA-GAP potential VAT calculation and actual tax returns in sectors with large compliance gaps will provide better insights about further necessary actions. Together with the use of accrued collections in place of cash receipts, the detailed form of the model reduces its sensitivity to distortions from economic changes and timing effects.

Appendix I. The RA-GAP Model and Methodology

A. Introduction

RA-GAP aims at estimating potential tax revenues from macroeconomic data, and finding out the magnitude of gap by comparing it to appropriately evaluated actual tax revenues. In order to analyze the gap, the best way is to break down both revenue data into economic sectors and trace the trend of gap through time. This enables us to capture the reasons for fluctuations in the overall gap indicator, whether due to changes in potential revenue or to compliance issues in specific sectors.

The difference between the potential revenue under the current tax rules with full compliance and the actual revenue is called a compliance gap. RA-GAP will treat this gap as a representative indicator, and analyze its level and changes. Other indicators based on hypothetical tax legislation and the analyses of effects due to changes in tax policies ('policy gap' in RA-GAP) will be provided as supplementary components to help to explain the level and changes of potential revenues and gaps.

The general approach of the RA-GAP methodology is to estimate the size of the compliance gap on a *top-down* basis. That is, it sets out to estimate the total size of compliance losses by comparing actual VAT collections to potential VAT collections estimated from economic statistics covering the whole of the VAT tax base. The critical advantages of this approach are that (a) it should cover all compliance losses, whether or not they have been separately identified; and (b) the results can be compared to the costs of tax expenditures and reliefs as barriers to revenue mobilization. The alternative, *bottom-up*, approach of estimating losses of each behavioral component of the compliance gap individually may also be used to help identify drivers of the total gap.

Estimating potential value-added tax revenue

Potential tax revenue can be generally calculated as the sum of the product of potential tax bases and corresponding statutory tax rates. For VAT, there are several approaches to estimate the tax bases from macroeconomic statistics, e.g. from simply taking final consumption or by capturing the ends of VAT chains by looking at demand data.

In the RA-GAP, the aim is to deal with each sector's value added, i.e., output minus input, as VAT tax bases. Tracking value added by each sector along the line of production chains is exactly how VAT due is actually determined. In addition, in real VAT systems there are a large number of different treatments for commodities and sectors, such as exemption and the application of different tax rates. This approach enables us to directly reflect such systems in the estimation of overall potential tax revenues. It also carries an advantage that sectoral potential revenues can be easily estimated and matched to actual sectoral tax collections in the analysis, which enables the identification of causes of the level and changes to the overall gap.

It may be possible to adopt other approaches, such as using detailed household surveys and demand data, depending on the nature and quality of available data in a specific country. The worth of any method depends on the quality of data, and alternative approach might produce more reliable estimate if the used data are more reliable than the value added approach.

It should be noted that any approaches using macroeconomic statistics have error margins—due to simplifications in modeling and difficulty in measuring the full impact of the shadow economy. In addition, this kind of top-down approach in estimating potential revenues carries an inherent risk of overestimating potential VAT within the extant tax law because of tax avoidance activities and other questions of legal interpretation. Those may be technically complying with tax rules, but the reduction of revenue cannot easily be captured in the estimation. Without a specific adjustment, it would therefore be included in the compliance gap number, even though it requires a policy response or litigation, not administrative measures.

Determining the corresponding actual value-added tax revenue

The next step is to measure the amount of actual VAT collections. Tax is obviously collected in cash and all tax authorities record yearly cash collections, netting out payments and refunds during the period. However, in the analysis of RA-GAP, it is important to compare the potential tax revenue with the amount actually collected out from that potential in order to trace correctly the relative changes in compliance. Since cash collection in a specific period does not necessarily correspond to the tax due that accrued in the same period, it is necessary to allocate the cash collection data to the periods in which tax due actually accrued.

In general, yearly cash collection is the most eye-catching data, not least because total receipt of cash payments is one of the most reliable data. The RA-GAP approach will use cash collection data, but it will link collected tax revenue and underlying economic activities. This can be achieved through fully utilizing the vast volume of individual tax return and payment records available to tax authorities. This procedure helps us to capture the real trend of the compliance gap without the effects of concurrent lags in payments and refunds. Where appropriate, the RA-GAP estimates will be reconciled to cash-based estimates so as to allow tax administrations to better understand this linkage.

The tax collection data will be sorted out into sectors in the economy, and compared to the potential revenues for each sector. Using sectoral or institutional collections data will help us to understand trends, by considering specific features. A comparison of potential VAT receipts against actual collections for each individual sector also allows us to identify those sectors with larger compliance gaps, and thus some insight as to the nature and placement of noncompliance in the country.

It would be also useful to take into account assessment data showing amounts assessed but not yet collected at specific points. Such data will also help analyzing the causes of changes in compliance level, and may give useful information of a need for streamlining systems such as investigation, assessment and enforcement.

Relative size of 'compliance gap' to 'policy gap'

RA-GAP will treat a compliance gap as a representative indicator, and analyze its level and changes. As a further analysis, the magnitude of the compliance gap can be compared with the impact of policy measures, by using the indicators based on hypothetical tax legislation and the analyses of effects due to changes in tax policies. RA-GAP will provide this indicator as a 'policy gap'. This analysis can provide policy makers and administrators with a perspective on necessary actions for revenue mobilization.

B. Measuring Potential Revenues for a Value-Added Tax

The RA-GAP employs a model designed to estimate the taxable value-added across all sectors of the economy. The approach is similar in structure to the method individual taxpayers use to determine their individual liabilities. The tax liability for an individual taxpayer is determined by the amount they pay customs on their imports, plus the VAT they must charge on their output sold domestically (exports being zero-rated), less the VAT they paid on their inputs. The value-added model works with statistical data available through national accounts supply-use tables, or input-output tables, to estimate the potential amount of tax on imports by a sector, plus the tax applicable to the output of a sector, less the amount of input tax credit due the sector.¹⁵

The potential revenues model

The value-added based potential revenues model is:

$$PV^s = \sum_c (M_c^s \times \tau_c) \times r^s + \left[\sum_c (Y_c^s - X_c^s) \times \tau_c \right] \times r^s - \left[\sum_c (N_c^s + I_c^s) \times \tau_c \right] \times r^s \times (1 - e^s) \times \eta_c^s$$

Where,

PV^s = the potential net VAT for a sector,

M_c^s = imports by sector s of commodity c ,

Y_c^s = output by sector s of commodity c ,

¹⁵ An alternate model structure for estimating the potential revenues for a VAT is to use statistical data on final consumption to determine the VAT paid by the end consumer, and then add an estimate of the amount of final VAT borne by exempt businesses using statistics on intermediate demand. In theory both methods should yield similar results, as they are both theoretically identical definitions of the potential tax base. This equivalence is similar to the basic National Accounts identity:

$$C [+G] = Y - I - X + M [-G]$$

The consumption based approach to estimating the base would be represented by the left-hand side of the equation, with the value-added based approach represented on the right hand-side. "G" is appearing as potentially being on either side of the equation, as its location, for a VAT gap model, would depend on the precise treatment of government - whether they have to pay tax on their purchases, and so more closely relate to final consumption, or whether they are not subject to the VAT and so are excluded from the potential VAT base.

X_c^s = exports by sector s of commodity c ,
 N_c^s = intermediate demand (consumption) by sector s of commodity c ,
 I_c^s = investment by sector s of commodity c ,
 τ_c = the VAT rate that applies to commodity c (zero if zero-rated or exempt),
 η_c^s = the proportion of input tax credits for commodity c by sector s allowed to be claimed,
 r^s = the proportion of output for a sector produced by registered businesses, and
 e^s = the proportion of output for a sector which is exempt output.

Values for each of these variables are determined as follows:

Y, X, M, N, and I: Data for these variables is obtained from their respective components in statistical supply-use (or input-output) tables. The data for the external trades, X and M, require some adjustment before being input into the model; this adjustment is described below.

τ_c : This is the first of the two “policy variables” in the model. The values for τ_c are obtained from the tax rate structure for each commodity, except for trade services. The explanation and method for the trade services are described below. For the calculation of hypothetical revenues under reference tax structure, the standard rate is assigned to the full vector τ_c , apart from those supplies typically exempted internationally (margin-based financial services, life insurance, and residential rents).

η_c^s : This is the second policy variable in the model. The values in estimating current potential revenues are determined by any specific statutory limitations on input tax credits, such as a general disallowance of input tax credits for restaurant meals; such a disallowance would be indicated by a value of 0 for the commodity of restaurant meals across all sectors; the default value is 1. All values in η_c^s are set to 1 for the calculation of revenues under reference tax structure.

r^s : Estimates for the values for r^s are determined in conjunction with the authorities, possibly making use of business licensing data, or Customs transactions data.¹⁶

e^s : The proportion of output for a sector which is taxable is a function of τ_c . The values for e^s are determined by comparing the value of exempt output in a sector to the total output of the sector. That is $e^s = \sum_c (Y_c^s \times \tau'_c) / \sum_c (Y_c^s)$, where τ'_c is a vector which distinguishes whether commodity c is exempt ($\tau'_c = 1$) or taxable ($\tau'_c = 0$).¹⁷

¹⁶ There is an assumption here that the same value of r^s applies across Y, X, I, and N. It can be shown that this assumption is only of consequence if there are any significant difference between the level of r^s for Y and X. As the level of r^s is generally fairly close to one, the results are not that sensitive to this assumption. As such, while it might be more technically correct to come up with separate values for Y and X, this would likely greatly increase the time and effort required to construct the model with no discernible difference in the final results.

¹⁷ This assumes that the proportion of inputs to output used in producing the taxable supplies and nontaxable supplies is identical. While this is most likely not the case for any individual taxpayer, many jurisdictions use just such an apportionment rule to determine the allowable amount of input tax credits for businesses making split supplies (taxable and exempt supplies). In such case this model treatment would exactly coincide with the statutory requirement. In jurisdictions where taxpayers are allowed to apportion their supplies based on actual use, e^s could be determined by tax return data on the proportion of input tax being creditable to those sectors with exempt output—presuming the required information is being captured on the return.

Adjustments for Variables X and M

Adjustments to the raw statistical data for exports and imports as supplied by the supply-use tables (or input-output table) are necessary. Specifically the values for exports needs to be adjusted to remove the value of domestic consumption by nonnationals, and the value of consumption abroad by nationals which is included in the values for imports needs to be removed.¹⁸

Determining the weighted average statutory rate for the output of the trade sector

To determine the value for τ_c applicable to the retail and wholesale trade services, a weighted average statutory rate is determined based on the trade margins by commodity type. This rate is determined as follows:

$$\tau_T = \sum_{c'} (\tau_{c'} \times K_{c'}) / \sum_{c'} (K_{c'}) ,$$

where,

τ_T = the weighted average statutory rate for the trade services commodities,

$\tau_{c'}$ = the statutory rate for commodity c' , where c' includes all commodities but the trade services commodities, and

$K_{c'}$ = is the trade margins associated with commodity c' .

Accommodating complexities in the policy structure

While the two policy variables τ_c and η_c^s can be used to model most policy structures, there are some structures which they are able to accommodate. There are too not uncommon circumstances in particular which either requires adjustments to the inputs into the model, or adjustments to the structure of the model:

- a) a tax structure that has provisions which relate to a sector as a whole, as opposed to a particular type of supply or commodity; for example an exemption which applies to the financial sector instead of particular financial services; and
- b) a tax structure that has special provisions for particular types of transactions; for example the zero-rating of certain otherwise taxable business-to-business transactions.

¹⁸ In a best case scenario the supply and use tables will specifically include the data used for these out these special categories of imports and exports (domestic consumption by nonnationals, and consumption abroad by nationals) making it simple to adjust the tables to the definitions for VAT purposes. In cases where this specific data is not available, an approximation can be made by removing values for the import or export of services which are typically consumed at the place of supply—such as hotel and restaurant supplies, and local transportation supplies.

Sector specific tax rates

Sector specific tax rates can be accommodated by using a sector by commodity matrix of tax rates, τ_c^s , instead of the simple vector in commodity space, τ_c , for the treatment of the tax to be applied to output, and in the computation of input tax credits. The simple τ_c vector of rates would still apply against imports.

The calculation of e^s also needs to be adjusted in such cases. Instead of using $\sum_c (Y_c^s \times \tau_c')$, to determine e^s , as specified in the equation above, the calculation would include the term $\sum_c (Y_c^s \times \tau_c^{s'})$, where $\tau_c^{s'}$ is a matrix of specific vector of ones and zeros, with one indicates an exempt commodity c for sector s – so $\tau_c^{s'}$ would have a vector of zeros for any exempt sectors.

Transaction specific treatments

Dealing with transaction specific treatments, where a different rate schedule might apply to a supply depending on the nature of either the supplier or recipient generally requires additional data on the value of these supplies. These specific treatments cannot, in fact be accommodated in the model and must be dealt with on the data side. There are two classes of these types of transactions, taxpayer-to-taxpayer transactions, and taxpayer-to-final consumer transactions. These two classes of transactions require separate treatments.

1) Taxpayer-to-taxpayer transactions

There are two potential solutions to deal with this circumstance: split the commodity into two component commodities based on their tax treatment, or to ignore such transactions. To split a commodity requires adding a new commodity to the supply use tables and to the policy variables. Adjustments to both the output and input variables would be needed. This treatment requires data on the value of these transactions.

It is also possible to simply ignore these transactions. These transactions have no net impact on the overall gap estimate; they only impact the value of the gap at the sectoral level. The gap for one sector in the transaction will include some of the gap which should be allocated to the other sector.

2) Taxpayer-to-final consumer transactions

Again special tax treatments under this category require treatment on the data side. In this case the final estimate of the potential VAT from the retail sector would need to be reduced by external estimates of the cost of the tax expenditure.

C. Measuring Actual Collections

The RA-GAP measures actual tax collections from the same economic activities upon which potential revenues are estimated. It requires reallocation of cash collection data into the periods in which tax due actually accrued.¹⁹ These reallocated data are called ‘accrued collections,’ formulated as follows:

$$AV^S = C^S + P^S - R^S (+ OP^S)$$

Where,

AV^S = accrued VAT collections for the period,

C^S = collections at customs in the period,

P^S = payments received for the period,

R^S = excess credit accrued for the period, and

OP^S = payments offset by excess credit (excess credit carried forward to offset tax due, or excess credit accrued for the period used to offset tax owing for the past periods).

Values for each of these variables are determined as follows:

C^S : Collections at customs in the period, by sector, are obtained from the customs declaration database. Declaration data necessary to determine these amounts includes: the value of VAT payments on imports, the date of entry for the declaration the payment is associated with, and the sector of activity for the taxpayer making the declaration.

P^S : Payments received for a period is obtained from the payments transaction database. The data needed from the payment transactions database would include: the value of VAT payments made (exclusive of interest or penalties), the date of payment, the tax period for which the payment is for, and the sector of the taxpayer who made the payment.

R^S : To determine the amount of excess credit in a tax period, data from the tax returns database is required.²⁰ The data to be extracted would include: the value of excess credit, the tax period the excess credit return was submitted for, the date of filing for the return, and the sector of activity of the taxpayer who filed the return.²¹

¹⁹ While in the long run cash collections and accrual cash collections should balance out, there can be wide variations between the two for a given period, as cash collections will include arrears collections from other periods and the stock of arrears changes.

²⁰ While the transactions database may include data on actual refunds paid, data on the value of excess credits accrued in a period will be needed in order to properly measure the accrued collections. If the excess credit is used to offset other tax obligations, it should be recognized as a reduction in net VAT collections.

²¹ In order to properly measure excess credit for a given period, it may be necessary to compute it from some of the fundamental line items on the return, rather than using the reported value for net tax owing. The proper computation of net tax for the period should be: output tax on supplies made in the period, plus any self-assessed VAT on imports, minus VAT paid on inputs used in making taxable supplies. If this value does need to be recomputed, it will need to be computed on a taxpayer by taxpayer basis.

OP^s: This variable only applies in jurisdictions where taxpayers are required, or allowed, to carry excess credit generated in one period forward for use against any obligations in the next period, in place of a refund request, or to offset past tax liabilities by excess credit. These data would again need to be obtained from the tax return database, in addition to the related tax period, and the sector of the taxpayer.²²

There are a few additional nuances to the tax return and payments data necessary to consider when completing gap estimates, which are discussed below.

D. Measuring and Reporting the Compliance Gap

The compliance gap, as stated above, is measured by the current potential collections, as determined in step 1, minus the actual collections, as determined in step 2. As the value for accrued collections will change over time, the value for the gap will change over time. There are two general measures that RA-GAP uses in order to provide standardized static measures of the compliance gap which can be used comparatively over time, and across jurisdictions:

- 1) the compliance gap at the time of filing; and
- 2) the compliance gap at the time of Estimation.

The methods for measuring these two indicators, specifically the data considerations, are provided below. In addition there are some other measures which could be conducted dependent on data availability.

The compliance gap at the time of filing

The compliance gap at the time of filing is measured at the original filing/payment deadline. In measuring the accrued collections, data for P^s , R^s , and OP^s are filtered to only select payments and returns received before their appropriate deadlines. The tax return data selected for R^s and OP^s is the data as originally submitted by the taxpayer.²³ This measure for the gap will not change over time, and provides a basis for comparison as to how the gap evolves over time as the administration collects on arrears and yields additional assessments.

²² The amount of excess credit used to offset tax owing is generally not recorded explicitly on either the return or in the return database. The method for determining this value is: if the net tax owing (as determined above) is greater than zero, and the excess credit carried forward is greater than zero then the amount of excess credit used as a tax payment is either the net tax owing, if the excess credit carried forward is greater than the net tax owing, or the excess credit carried forward, if the net tax owing is greater than the excess credit carried forward.

²³ Most tax administration information systems keep track of the original values on a tax return, plus all subsequent changes. As the notion with this compliance gap measure is to attempt to measure only voluntary compliance, then it is important that the return values used not reflect any subsequent assessment actions by the authorities.

The compliance gap at the time of estimation

The compliance gap at the time of estimation is measured using the latest available data for returns filed, assessment values, and collection and refund payment values. Ideally this measurement would occur annually using the annual anniversary of the last filing/payment deadline for a tax year. Data for the variable P^s is filtered to select payments made by that date. The tax returns data for variables R^s and OP^s is the current assessed values for the data as of that date.²⁴ This value will change from year to year, but the value as measured at a particular point in time will remain static. Comparing changes to this measure of the compliance gap over time can provide insight into the collection performance of the administration.

Reporting the compliance gap

While the measure for the compliance gap above was expressed as simply being the difference between the potential revenues and actual collections, RA-GAP more commonly expresses the compliance gap as:

$$\frac{CPV - AV}{CPV}$$

or the compliance gap as a percentage of current potential revenues. This provides a more useful measure for comparing changes in the value over time, and across jurisdictions.²⁵ The values of the compliance gaps are also expressed as percentages of GDP, to provide a common basis for comparison with economic activities and the magnitude of policy gaps.

²⁴ Some compromise might be needed in regards to the assessed values, as not all administration information systems record the date for all changes to a return. As such, the compliance gap calculation might have to specify that it is based on the assessed data as of the date of extraction. Managing a consistent timeframe between each annual measurement would then involve maintaining a fairly consistent data extraction anniversary date.

²⁵ While an argument could be made that a value for the compliance gap measured purely as $CPV - AV$ is of more relevance, as it provides the authorities and policy makers a value for the potential yield to be gained in particular period from increased compliance efforts, this can be misleading—the value does not on its own give an indication of how much of that yield might be *reasonably* gained.

Appendix II. Tax Gap Methods Used by the Estonia Tax and Customs Board

42. **The Intelligence Department of ETCB aims to provide comprehensive tax gap analysis for all the major taxes and categories of compliance risk in Estonia.** In addition to being used to set operational priorities in tactical compliance risk management, they are brought together in the annual Basic Strategy Analysis exercise, which is used to determine high-level business plans, targets and resource allocation for ETCB. Table 1 shows the methodologies used for each tax gap.

Table 1. Estonia Tax and Customs Board Tax Gap Estimate Methodologies

| Head of Duty | Tax gap model |
|-----------------------|--|
| VAT | Top down, end-consumption model, with bottom up models for individual compliance risks |
| Tobacco duty | Household survey and administrative data, plus private sector market research |
| Alcohol duties | No robust model found |
| Customs duty | Structured risk assessment |
| Road fuels | Comparison of usage from transport survey vs legal clearances |
| Packaging excise duty | Comparison of national accounts sector aggregates and tax returns |
| Dividends tax | No robust method found |
| Personal income tax | Household survey conducted by research agency |

43. **ETCB recognizes that data and resource constraints necessarily generally limit the accuracy of tax gap analysis.** Accordingly they treat such analysis as assessments or indicators of the relative scale and broad trends of compliance risks rather than precise estimates of the level of losses. This is an appropriate treatment of tax gap estimates, which can never be precise and generally have unknown, but broad, margins of error. In this regard, it is worth noting that, because the error terms in the assumptions used in tax gap analysis are generally biased, it is the case that tax gap estimates are generally biased in one direction or another (even if that direction is not known). Consequently it will be the case

that changes to the estimated level of tax gaps are generally more reliable than estimates of the level itself.

Value-added tax

44. **The VAT gap is the most established ETCB tax gap model.** ETCB use an end-consumption based model, and have estimated the Estonian VAT gap from 2004. ETCB estimates are compared with those of CASE and RA-GAP in Section II F, above.

45. **ETCB estimate the VAT gap using a simplified model of potential VAT based on end consumption by households.** The data used in the model, is taken from the EU-mandated WAR Own Resources account compiled by the Estonian Statistics Board. This is a well established approach, very similar to that taken by HMRC in the United Kingdom and by the CASE Consultancy in their study of VAT gaps in EU member states. In addition, ETCB estimate bottom up components of the total VAT gap independently, both to test the total gap estimate and to inform operational decision making. These estimates show the largest of these components, and with the most serious risk of growth, as being MTIC fraud (more recently Contra variants of MTIC) in the fuels sector.

46. **The ETCB potential VAT model excludes intermediate consumption in the exempt and government sectors.** This simplification will mean that there is a downward bias in their estimates of the VAT gap (because the tax base is under-stated). Normally, the inclusion of these sectors should not make a major difference to estimated year-on-year changes to the VAT gap, but shocks to excluded sectors or other significant changes to the composition of Estonia's GDP could create errors in the estimated changes. For example, the relatively heavy investment in exempt sectors in 2006 and 2007 will have increased stuck VAT liability, and so would have increased collections in a way that would not have been anticipated in the ETCB VAT base model. This will have artificially reduced estimated VAT gaps for those years.

47. **The ETCB model of potential VAT estimates the VAT due on household expenditure at purchaser prices.** However, VAT is levied on prices excluding VAT. This will have resulted in an upward bias in the ETCB VAT gap estimates, because the tax base has been over-stated. It would seem that the net (opposing) effect of this bias and the one above is that they largely cancel each other out in the final results. Consequently, the ETCB estimates of potential VAT are close to those made by CASE and RA-GAP. However, the combined effect of these opposing biases will make it difficult to estimate reliably the underlying changes in the VAT gap.

48. **The receipts series used in the ETCB VAT gap calculation is cash-based, and changed in 2009.** Previously, claims for excess (net) input tax credits were carried forward until either claimed or offset against later VAT liabilities. They were not taken into account in VAT receipts until they were either refunded to traders or used to offset other tax liabilities. From the start of 2009, a single account was established for all taxes for Estonian taxpayers and excess credits, once approved, were released to this single account either for offsetting against any tax liability elsewhere or for refunding to taxpayers. From the date of the change, VAT receipts took excess credits into account as soon as they were released to the single account. This will have meant that, all else being equal, 2009 receipts were depressed relative to previous years, because the accounting for excess credits was brought forward. At the same time, ETCB actively reviewed outstanding excess credits to check their legitimacy and ensure they were refunded to extant traders if appropriate or transferred to state income where the trader no longer existed. The combination of these changes will have reduced markedly the amounts of unpaid excess credit being carried forward.

49. **ETCB VAT gap analysis is tested by operational intelligence and bottom up estimates of individual compliance gaps for particular types of noncompliant behaviour.** This is an important 'reality check' for the estimated gap, and enables ETCB to use it more effectively in its compliance strategy, for example in the annual Strategic Basic Analysis document.

Tobacco duty

50. **ETCB compares five independent estimates of the tobacco duty gap.** These estimates are as follows:

- Surveys of discarded cigarette packs conducted by KPMG and AC Nielsen for Philip Morris and Japan Tobaccos respectively. These surveys are conducted for all three Baltic States. (The Lithuanian gap is higher than the Latvia gap, which in turn is higher than the Estonian gap.)
- Postal survey of the prevalence and consumption of illicit cigarettes, conducted for ETCB by the Estonian Institute for Economics Research (EIER)
- The ETCB's own assessment of risks in the light of external research and operational intelligence and seizures
- Research conducted by TNS Emor (Latvia)

51. **There is a broad consistency between the estimates of the tobacco duty gap.**

The five sources estimate the gap to be in the range of 15–30 percent, with a broad consistency in estimated changes over the last few years. The gap rose when duty rates were increased significantly in 2009. The EIER estimates are systematically higher than the others. The ETCB estimate is broadly consistent with the other estimates, except for 2009 where the ETCB estimate is notably lower than the others.

Alcohol duties

52. **ETCB have found it more difficult to obtain robust estimates of the size of Estonia's alcohol duty gap.** This is because the market for alcohol, particularly illicit alcohol, is very diverse, and market research suffers from chronic under-reporting by consumers, particularly consumers of illicit alcohol. For example, EIER estimate that a rising market share is being taken by the illegal trade over recent years (going from about 10 percent to 25 percent), but this is not reflected in falling legal clearances—indeed, in the case of wine, there has been a marked increase in wine duty receipts over the four years.

53. **Alcohol gap estimates are derived from a comparison of estimated consumption derived from a household survey and actual clearances.** Commissioned by ETCB, EIER conduct a postal survey of 1,000 households to estimate the prevalence and consumption of illicit alcohol. They obtain lower and upper bounds for this by asking for both respondents' own consumption and their estimate of their neighbours' consumption. An expert panel then makes a judgement call as to the likely mid-point. ETCB accept the EIER estimate as 'indicative,' and in the absence of alternative data, use it for their estimate of the alcohol duties gap. **(NB:** alcohol duties as a whole account for about 3 percent of Estonian tax revenues.)

Customs duty

54. **This is largely a structured assessment of the potential scale of individual risks to the tax base.** These are added together to provide an upper bound estimate of the total at risk. This is likely to provide an upper bound of the total customs duty at risk, because there will be double-counting of amounts at risk to the extent that the individual risks overlap, or substitute for, each other. The total risk is estimated at c. €11 million. **(NB:** in common with other EU member states, customs duty is collected by ETCB on behalf of the European Commission (EC).)

Road fuels duty

55. **The ETCB estimates of the road fuels gap is based on transport surveys, conducted by the Estonian university, and vehicle registrations.** Expected fuel consumption is derived from road use, and converted to excise duty amounts, which are then compared to actual receipts. It should in principle include both smuggled fuels and misused rebated fuels. ETCB believe that the gasoline duty gap is negligible, and the diesel gap to be somewhere between 2½–10½ percent.²⁶

Packaging excise duty

56. **The packaging excise duty gap has also proved very difficult to measure robustly.** This duty was introduced to give suppliers an incentive to use less packaging and recycle more, by taxing packaging for domestic sales and granting exemptions for suppliers who joined approved recycling schemes. ETCB have found the duty to be very difficult to administer, more difficult to audit, and still more difficult to control. However, they believe that it has been successful to the extent that (a) the amount of packaging used in Estonia has fallen; and (b) recycling schemes are reporting increased take up.

57. **There are numerous challenges here, not only in estimating the tax gap, but in the administration and control of the tax.** The principal challenge (for both purposes) is in identifying the potential tax base reliably. However, using proxies for the tax base in their tax gap estimates, ETCB have estimated to a reasonable degree of assurance that the great majority of the potential tax is not being declared or paid. They estimate the tax gap to be of the order of 90 percent. Though the precise number is very uncertain, the Estonian national auditors have also independently estimated that a very large part of the potential tax is not being paid.

²⁶ This difference between the compliance gaps for the two major road fuel duties is probably to be expected. Gasoline is typically used in noncommercial vehicles, whereas diesel is much more heavily used by road freight transporters, who have a greater incentive to evade or avoid paying duty. Also, gasoline is a much more volatile compound than diesel, with obvious handling risks when distributed informally.

Dividends tax

58. **ETCB have been unable to find a sufficiently reliable way to estimate the Estonian dividend tax gap.** The dividend tax takes the place of Corporation Income Tax in Estonia. ETCB have examined potential proxies for tax base changes, for example car sales, but have not found any sufficiently reliable indicators. Such taxes are always difficult to model, especially for larger corporations where profit shifting or transfer pricing is a significant issue, because (a) complexity in such tax bases make it very difficult to calculate effective tax rates; and (b) national accounts and other survey data will likely use firms' own definitions of their reported income and expenses, which may be distorted for tax purposes.

Personal income tax and social security contributions

59. **ETCB's estimate of the personal income compliance gap is calculated by the Economic Research Institute on the basis of their postal survey of perceptions of tax.** There is a potential danger in this approach to estimating the gap, that it will work best on more low-level forms of tax losses, for example error and minor evasion; and much less well in uncovering losses from egregious tax avoidance or organised fraud. Recognizing this, ETCB assume that this top-down estimate reflects the overall scale of 'envelope salaries' only.²⁷

60. **ETCB supplement these top-down estimates of the personal income tax gap (above) with their risk-based, bottom-up analysis.** ETCB use regional and trade sector salary benchmarks (excluding management salaries) both to test the top-down analysis and to identify cases for audit. They also compare self-employed entrepreneurs' declared incomes with those of equivalent, salaried workers'. In addition, ETCB takes third party information—for example from real estate registers, stock exchange, fishing and forestry permits—and compares it to annual income declarations for personal taxes. In order to identify undeclared amounts.

²⁷ The term, 'envelope salary', in Estonia refers to informal cash payments made to workers—often in the construction sector—either as an untaxed supplement to their declared wages or for moonlighters' secondary employment. The mass-market form of this tax evasion and relatively low individual amounts involved make it more likely to be captured by household surveys.

Appendix III. Factors Potentially Affecting the Estimated Compliance Gaps in Estonia

61. **There are four main possible factors that can affect estimates of the tax gap:** (1) data issues; (2) timing issues; (3) taxpayer planning activity; and (4) taxpayer compliance issues. Findings under each of these categories are provided below.

Data issues

62. **There can be two major sources for data issues: issues with the statistical data, or issues with the tax records.** In general, national accounts data provided by the Estonian statistical agency appears to be of a high standard. Furthermore, because Estonia is an EU member state, it is required to conform to Eurostat standards. In addition it is timely, detailed and internally consistent. ETCB tax return data made available to the IMF was of a similarly high standard, being detailed, internally consistent, timely and in a suitable format for quantitative analysis.

63. **Estonia's position as an open, trading economy with much larger neighbors makes tax gap estimates more sensitive to necessary modeling assumptions.** It is striking that the retail and wholesale sectors in Estonia account for over 60 percent of the VAT base. This is an unusually high percentage, and limits the amount of information that can be drawn from the RA-GAP sectoral decomposition of the compliance gap. Similarly, imports and exports are each equivalent to almost 100 percent of Estonia's GDP, which is extremely high. The VAT treatment of imports and exports is not always consistent with statistical treatment in national accounts—for example, in the treatment of processing goods for the purpose of re-exporting and the treatment of hotel and restaurant services for foreign visitors. Consequently, adjustments need to be made to the national accounts data, which need to be checked for consistency between trade statistics and tax declarations, so as to produce accurate total gap estimates. In addition, for the calculation of sector tax gaps, imports and exports must be allocated on the basis of limited data and assumptions. These will also need to take into account the fact that customs declarations may be made by agents rather than principals. These adjustments may therefore have a disproportionate impact on decomposition of estimated potential VAT and VAT gap into sectors.

Timing factors

64. **No major timing factors have yet been positively identified beyond the potential impact of a major accounting change in 2009.** In 2009, ETCB made a major change to their accounting system for tax receipts, introducing a single account to consolidate liabilities and credits across Heads of Duty. They also changed their risk management of VAT credit returns so that they were risk assessed when the credit return was submitted rather than when refunds were actually claimed. This will have greatly speeded up the processing of such returns, and, with the automated offsetting of excess VAT credits against any outstanding tax liabilities, reduced dramatically the stock of carried forward excess credits. The scale of these changes was such that the ETCB had to suspend repayments for a month during the changeover. In principle the RA-GAP calculation of accrued collections should mean that they are unaffected by the changeover. However, the RA-GAP collection gap peaked in 2009 without affecting the overall compliance gap noticeably. It is possible that this is due to a residual timing impact from the accounting change.

Tax planning activity

65. **By its very nature, tax planning activity can be difficult to detect in tax record data.** Most aggressive tax planning is designed to make one type of activity or its timing meet the definition of another type of activity or timing; and so good planning would not be apparent on the face of tax declarations. Tax planning can occur to take advantage of rate differentials for the same activity, which for Estonia could mean taxpayers taking advantage of intra-community rate differences for an activity by characterizing activities as having occurred in another member state with a lower rate. There is however no particular evidence yet of widespread such tax planning impacting on Estonian VAT revenues.

66. **Detection of the relocation of output to another country to take advantage of lower rates can be difficult using VAT return data alone.** A potential indicator is changes in the level of self-assessed trade in services; in order to service customers from a foreign location there must be some level of service passing between the local and foreign offices, and these would need to be self-assessed. There is no evidence yet of such arbitrage impacting on VAT revenue.

Compliance factors

Value-added tax

67. **Prior to 2010, changes in VAT receipts relative to GDP in Estonia are largely explicable by changes to the composition of Estonia's economy.** Over the period 2004–2007, Estonia went through strong and sustained GDP growth following accession to the EU, fed by strong investment, particularly in the housing sector. In 2008, receipts dropped sharply, partly as a result of the economic crisis, but possibly also because of a combination of (a) firms delaying payment of their obligations due to cash flow problems; and (b) firms running down their outstanding excess credit balances to help their cash flow.²⁸ 2009 receipts came in above forecast—possible reasons include firms running down their inventories and the payment of arrears due on 2008 returns. There was also an accounting change introduced in 2009, with a consequent disruption of excess credit refunds, which may have affected the reported figures.

68. **In 2010, ETCB discovered serious MTIC frauds emerging in the fuels sector.** They introduced warrantees as a counter measure in June 2011, and this tripled net VAT revenues in the fuels sector. Assuming this step increase reflected the amount of prevented MTIC repayment fraud; on an annualized basis, this suggests MTIC losses in the fuels sector were previously c. €100 million.

69. **ETCB use risk profiles to assess the likely impact of MTIC frauds.** To test this, ETCB used the lowest performing 10,000 VAT traders in terms of net VAT payments and number of employees relative to turnover as a proxy for MTIC Contra and Buffer traders (or companies at risk of under-declared salaries). If these traders had paid VAT on 10 percent value added (a conservative assumption, as an offsetting bias for bias from genuinely poor performing firms caught in the sample), this sample should have produced €80 million. In the event, they only paid €8 million, suggesting a tax loss of around €70 million. Whilst this analysis is obviously heavily assumption driven, it does lend plausibility to the estimate of MTIC losses (and an overall compliance gap of €230 million).

²⁸ According to figures provided by ETCB to the mission, the stock of carried forward excess credits was reduced by about €50 million in each of 2008 and 2009.

70. **From 2011 to April 2012, net VAT receipts from the fuels sector fell, suggesting the return of MTIC fraud in that sector.** Further counter-measures taken in April 2012 led to a reasonably strong recovery but further erosion has taken place since then. Even so, the overall compliance gap in 2012 fell, though not to 2008/2009 levels. Emerging outturns for 2013 receipts indicate a further recovery of revenues. MTIC fraud has since been uncovered by ETCB in gold and scrap metal trading. In the fuels sector, ETCB have seen MTIC traders moving to Contra trading to disguise MTIC frauds.

71. **Excess credit claims are treated as potentially serious compliance (MTIC) risks by ETCB.** They are subjected to universal, systematic risking and possible audit interventions before being released to traders' single accounts. Refunds have to be made within strict deadlines, subject to audit interventions or criminal proceedings. Before 2009, excess credit claims were only checked prior to actual payment of the claimed refund. In addition, the authorities are currently steering new legislation through the Estonian parliament that would require VAT taxpayers to submit detailed lists of their purchases and sales transactions with their monthly VAT returns. The purpose of this is to allow the ETCB to match input tax credits claimed by purchasers to corresponding output tax declarations and payments by suppliers.

72. **Mandating detailing VAT transaction returns is a strong anti-MTIC measure.** However it does create the risk of placing an excessive compliance burden on legitimate businesses and administrative burden on the ETCB. It is also not a perfect defense against MTIC fraud—supply chains used in the fraud can be manipulated to move the fraudulent transactions away from the more obviously high risk taxpayers. The ETCB is aware of the administration risk and will apply risk profiling before the data matching stage, so that they only check the higher risk taxpayers. They are also aware that the process will at best contain MTIC rather than stop it completely.

Tobacco duty

73. **Illicit sales of cigarettes in Estonia are characteristically sourced from smuggling across the land border with Russia.** ETCB also seize a number of large consignments of nonduty paid cigarettes in commercial vehicles that are in transit to other EU countries, as well as seeing high retail sales to day trippers on ferries from Finland. Household prevalence of illicit purchases has been found to be linked with unemployment and income, and positively correlated with the degree of householders' personal ties with Russia (e.g., family and ancestry).

74. **Until recently, manufacturers heavily forestalled duty increases, releasing up to 8–10 months' sales on the market just ahead of duty rises.** Tobacco duty increased in 2008, entirely because of forestalling against a rise at the beginning of 2009. Forestalling is now capped by law, and a de-facto duty escalator is in place. Following the 2009 rate rise, duty-paid sales decreased by 25 percent, partly from forestalling, partly due to own-price elasticity, but mainly due to an increase in smuggling. The smuggling is now thought to have stabilised, but the lost market share has not been recovered. ETCB believe that the revenue maximisation point for tobacco duty has now been passed (which would mean that the duty escalator is losing money for the Estonian Exchequer).

Alcohol duties

75. **Illicit alcohol products are heavily smuggled across the land border with Russia, but spirits from illegal stills and misdescribed spirits are also encountered.** Both of the latter have attendant serious health risks. The misdescription of spirits is generally that they are being sold as toiletries even where they are obviously intended for drinking, for example, 60 percent spirit in typically sized spirits bottles sold as mouth wash or men's fragrance. Counterfeit stamps are now an issue. There is also heavy smuggling from Estonia to Finland—about one-third of Finnish consumption is believed to be bought in Estonia (including Finnish brands). Counter-measures have included heavy restrictions on personal allowances for travellers from Russia, and excise stamps.

76. **Illicit market prices appear to be pegged to duty-paid prices rather than production costs.** There is believed to be an inverse link between the alcohol gap and GDP, and a high correlation with unemployment. There is also a negative correlation in household prevalence with distance from the Russian border. ETCB believe that there is a long term trend away from the informal market

77. **The EIER research suggests that the alcohol duty gap as a percentage of potential tax has been rising at the same time as alcohol duty receipts have been increasing.** Theoretically, the EIER estimate could be consistent with the observed trend in clearances if consumption of illicit alcohol is independent of legitimate consumption—i.e., it is not substitutional. There is some limited support for this possibility from the United Kingdom's experience, which was that most nonduty paid imports of wine in the United Kingdom and much of beer smuggling and personal imports have been opportunistic. However, alcohol trends can be difficult to model. In addition to the known under-reporting in household surveys, the market for individual types of alcohol can be surprisingly volatile, being sensitive not only to price but also to cultural influences (i.e., fashion and peer pressure).

Road fuels duty

78. **Most illicit road fuels are diesel consignments smuggled from Russia that are misdescribed, abusing standard tank capacity or using forest roads outside effective customs controls.** ETCB also see heavy use of fuels additives and the misuse of rebated, dyed fuel. Counter-measures in recent years have included restrictions on frequent border crossings by individual vehicles (as well as passive cameras on forest roads). This markedly reduced not only the number of such repeat crossings, but the amount of cross-border traffic overall. The ETCB's gap estimates provide reasonable evidence of step decreases in the road fuels gaps following ETCB counter-measures over the last few years.

Packaging excise duty

79. **Given the likely scale of the packaging excise duty gap, the precise amount being lost is of much less interest than the fact that collections are only a small part of the potential tax base.** This suggests the following:

- If the packaging duty is to have a revenue raising function, it needs to be re-designed so that it can be administered and controlled more easily.
- If the tax was introduced primarily to reduce packaging waste, then to the extent that the tax has actually reduced domestic consumption of packaging (as emerging indications suggest), the tax is indeed successful. However, in the absence of credible administration and control there must be a serious risk that suppliers will decide not to incur the costs of cutting down or recycling packaging and simply evade the tax instead.

Personal income tax and social security contributions

80. **The chief threat identified in personal income tax is from cash payments to employees (envelope salaries) not being declared for tax.** This is a particular risk in industrial sectors that use a lot of casual labor, for example the construction and hospitality sectors. This is an endemic problem for most authorities around the world. The tax gap for self-employed people in Estonia is estimated to be €11.7 million, largely from personal income tax and social security contributions.