FOR INFORMATION

FO/DIS/22/54

March 31, 2022

To: Members of the Executive Board

From: The Secretary

Subject: **Sweden—Technical Assistance Report—Revenue Administration Gap Analysis Program—Corporate Income Tax Gap**

Board Action:	Executive Directors' **information**
Publication:	Yes, after Thursday, April 7, 2022
Questions:	Mr. Hutton, FAD (ext. 38073)

F I S C A L A F F A I R S D E P A R T M E N T

Sweden

Revenue Administration Gap Analysis Program — Corporate Income Tax Gap

Eric Hutton, Elena D'Agosto, Mick Thackray, Martin Knudsen, and Ryan Yost

Technical Report

June 2020

This technical assistance (TA) was provided with financial support from the European Union.

CONTENTS

ABBREVIATIONS AND ACRONYMS

BEPS	Base Erosion and Profit Shifting
CIT	Corporate Income Tax
EU	European Union
FAD	Fiscal Affairs Department
GDP	Gross Domestic Product
GOS	Gross Operating Surplus
IMF	International Monetary Fund
PE	Permanent Establishments
RA-GAP	Revenue Administration Gap Analysis Program
STA	Swedish Tax Agency
SRSP	Structural Reform Support Programme
SRSS	Structural Reform Support Service

Terminology And Model Specific Acronyms Used in The CIT Gap Analysis

CIT base gap	Difference between potential C-TB and declared C-TB, presenting how much taxpayers underreport their tax base, before considering deduction for carried-over losses and tax credits/additions
CIT-efficiency ratio	Ratio of actually declared CIT liability to gross operating surplus multiplied by the statutory rate. It indicates the overall efficiency of the CIT system.
CIT gap	Difference between potential CIT liabilities and declared CIT liabilities
CIT productivity	Ratio of actually declared CIT liability to GDP multiplied by the CIT statutory rate.
C-NTB	Current-year net tax base, showing taxable income before considering deductions for carried-over losses, netting out current year losses calculated for tax purpose
C-TB	Current-year tax base, showing taxable income before considering deductions for carried-over losses
FAP	Financial accounting profit/loss
S11	Non-financial corporation sector
S12	Financial corporation sector
S13	General government sector
S14	Households sector
S15	Non-profit institutions serving households
TB	tax base, showing taxable income after deducting carried-over losses

PREFACE

In response to a request from the Swedish Tax Agency (STA), the Fiscal Affairs Department (FAD), IMF, provided a tax gap analysis for the corporate income tax (CIT) in Sweden. This assistance was provided with support from the European Union under the Structural Reform Support Programme. In January, 2019, Mr. Eric Hutton (FAD) led a mission with Mr. Martin B Knudsen (FAD), accompanied by Ms. Elka Ilyova of the Structural Reform Support Service (SRSS), to Stockholm to collect data and other information required to conduct a tax gap analysis for CIT following the IMF's RA-GAP (Revenue Administration – Gap Analysis Program) framework. After modeling at IMF headquarters, preliminary results for the tax gap analyses were provided to STA officials for CIT in a follow-up visit, led by Mr. Eric Hutton, with Elena D'Agosto (FAD), and again accompanied by Ms. Elka Ilyova, which took place in Stockholm, Sweden in December 2019.

The mission expresses its sincere appreciation for the cooperation of STA officials, in particular Mr. Lars Lindvall and Mr. Damian Migueles Chazarreta, for their kind support to the mission, and for providing the data and information required for the analysis. The mission also thanks officials from Statistics Sweden for providing necessary data and explanations for implementing the analysis in this report. Finally, the mission thanks the support provided under the EU SRSP, and the coordination and cooperation provided by Ms. Elka Ilyova.

EXECUTIVE SUMMARY

This report presents the estimates of tax gaps for corporate income tax (CIT) in Sweden by applying the methodology of the IMF's RA-GAP (Revenue Administration – Gap Analysis Program).

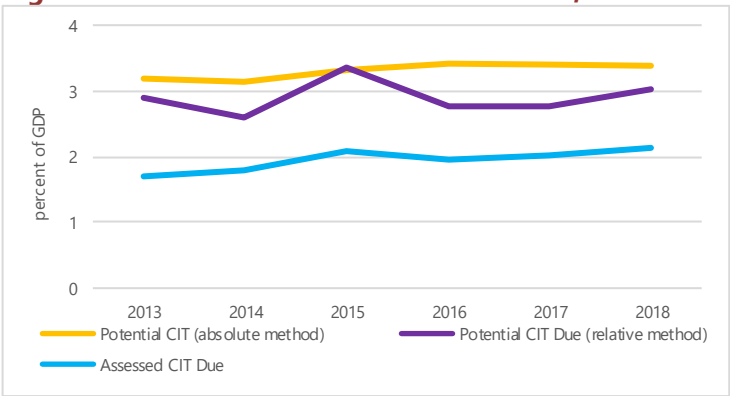
The RA-GAP methodology for CIT gap is based on a top-down approach, which estimates the potential tax base and liability from macroeconomic data. The estimation considers first the theoretical differences between the coverage of statistical macroeconomic data vis a vis the actual tax base of CIT, and then compares the estimated results with actual declarations and revenues. It has the advantage of using available data, without additional costs of gathering additional information/data, and providing initial evaluations of overall CIT noncompliance in a country. In this regard, quality of macroeconomic data and tax records for CIT are crucial for the quality of the estimates.

To estimate the CIT gap, the RA-GAP CIT gap methodology was applied to available macroeconomic data for non-financial corporations from 2013 to 2018. The potential CIT base and liability were estimated from gross operating surplus (GOS) of non-financial corporations, with necessary adjustments for conceptual differences between GOS and tax base/liability of CIT, and compared with declared CIT base and liability. Potential CIT is measured using two different approaches, an *absolute method*, and a *relative method*. The absolute method assumes that most non-compliance is related to under-declaration of income, so that all deductible expenses have been declared. The relative method assumes that most non-compliance is from non-reporting, and so that both incomes and expenses are not being declared. These two methods should then serve as "book ends" for the true level of non-compliance, as actual non-compliance is likely a blend of these two types of non-compliance.

Main Findings

Assessed CIT increased from 2013 to 2018 while potential CIT in 2018 was roughly the same as it was in 2013 (Figure 1). Assessed CIT, as measured as a percentage of GDP, increased from just a little below two percent of GDP to a little more than two percent. While the levels for the estimated potential CIT under the relative methods exhibits a lot of volatility, the two methods both exhibit a fairly flat longer-term trend for the period.

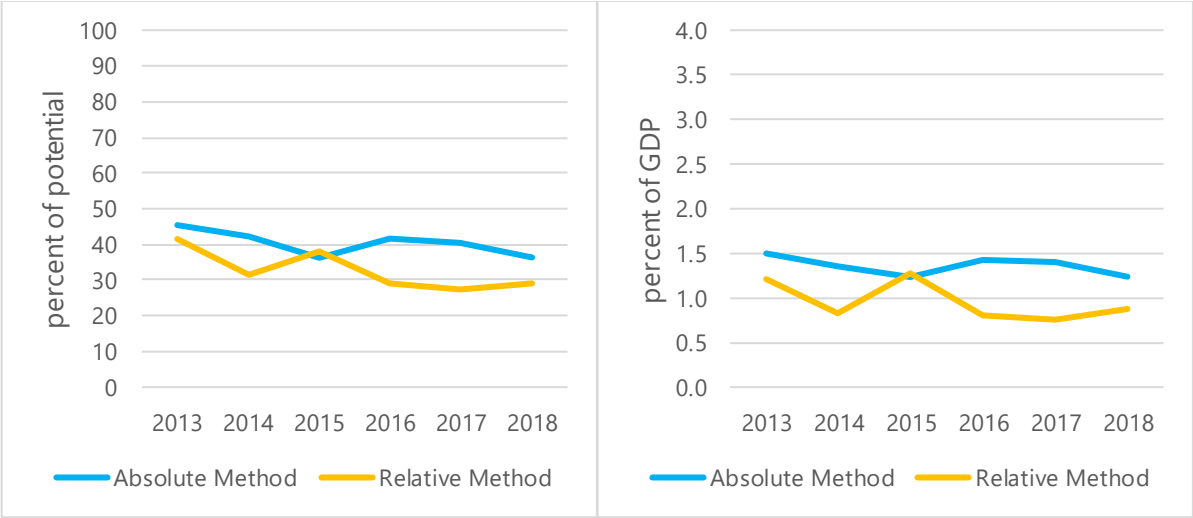
Figure 1. Sweden: Assessed vs Potential CIT, 2013–2018



Source: Staff calculations based on data from Statistics Sweden and Skatteverket

The estimates for the assessment gap (a good proxy for the overall compliance gap) indicate an overall declining over the period, with some volatility for 2014 to 2016 (Figure 2). The assessment gap is one component of the compliance gap, the other component being the collection gap. The collection gap could not be determined for this report, as a data on the amount of CIT arrears owing for each tax period could not be compiled. Typically, the bulk of the compliance gap is the assessment gap, so this does serve as a good proxy for the overall compliance gap. While both methods do indicate that the gap has declined from 2013 to 2018, there is some volatility evident. The very large year over year changes in the gap estimates, particularly for 2015, are unlikely to have occurred, and are more likely the result of differences between the statistical data and the tax administration data in the recoding of when certain economic activity or transactions occurred.

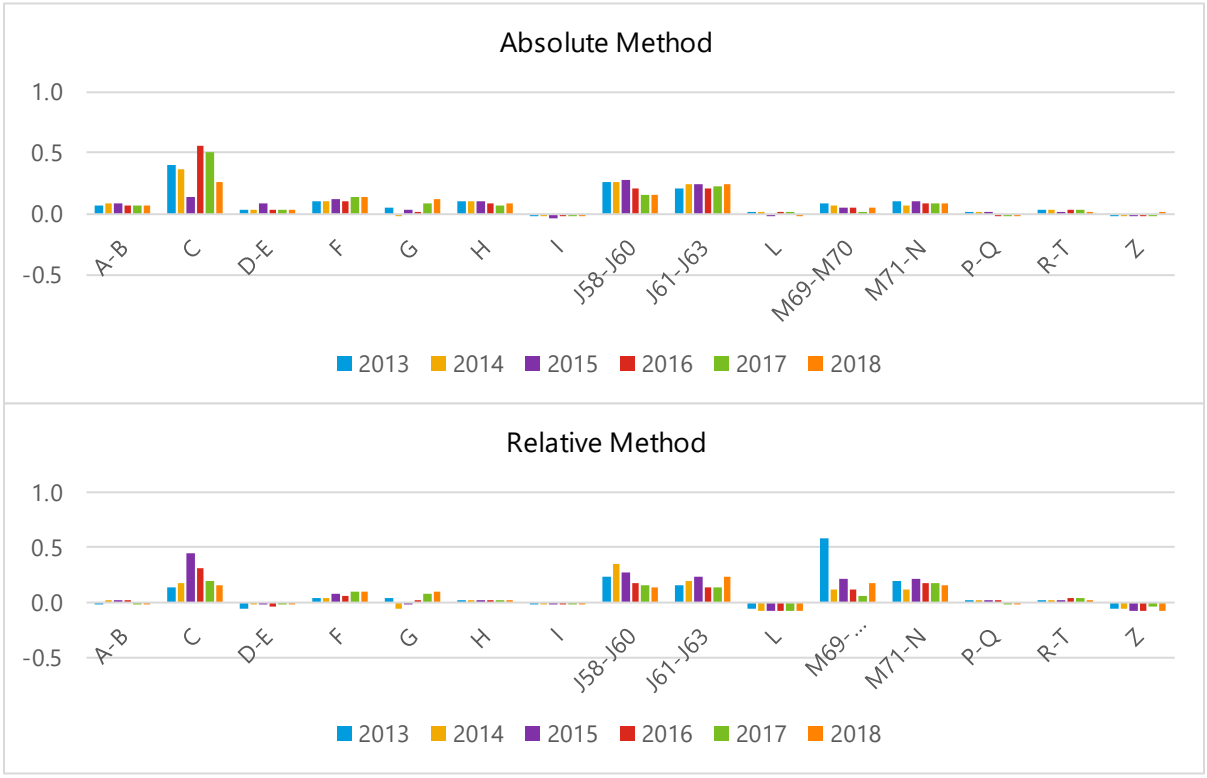
Figure 2. The Assessment Gap, 2012–2017



Source: Staff calculations based on data from Statistics Finland and Skatteverket

Under either method the bulk of the assessment gap appears to be in the manufacturing sector as well as in the media, telecommunications, and information sectors (Figure 3). While there is also a significant gap in the legal and head offices services sector under the relative method, this sector is largely related to the manufacturing sector - businesses may have identified this as their sector of activity to the tax authority, but in the statistical data many have been identified as being in the manufacturing sectors.

Figure 3. The Assessment Gap by Sector, 2013–2018



Code	Description	Code	Description
A-B	Agriculture, mining	J61-J63	Telecommunications and Information technology services
C	Manufacturing	L	Real estate services
D-E	Electricity, water	M69-M70	Legal, head offices services
F	Construction	M71-N	Other business, professional services
G	Trade services	P-Q	Public administration, education, health care
H	Transportation services	R-T	Other activities
I	Hospitality services	Z	Taxpayers without sector codes
J58-J60	Publishing, media services		

Source: Staff calculations based on data from Statistics Sweden and Skatteverket

Comments on the Findings

Some significant assumptions were needed to be made to enable the RA-GAP estimation of potential CIT base and liability; therefore, CIT gap estimates should be interpreted with caution. The definition for "non-financial corporations" used in national accounts includes some unincorporated enterprises, so there is not a perfect match to the corporate income tax base. Some assumptions had to be made as to the impact of these differences, which may be affecting both the level and trend in the resulting gap estimates. There is also an issue with the tax

declaration data; the methodology requires being able to fully distinguish between operating revenues and costs and other revenues and costs from the declaration data, but the current tax declaration has some lines which might be blending operating and capital costs.

The current estimates are believed to over-estimate the CIT assessment gap, possibly significantly. There is an issue with the tax declaration data available for use. The methodology requires being able to fully distinguish between operating revenues and costs and other revenues and costs from the declaration data, but the current tax declaration has some lines which might be blending operating and capital costs. For these estimates we have treated all these as being operating costs, which provides us with a lower bound for the measure of assessed GOS. If we were to exclude all the costs, the resulting gap would be negative, which would obviously be an extreme under-estimation of the gap. There could also be an issue with transfers of income within a group, if those group contributions are passing between non-financial institutions (included in the study) and financial institutions (excluded from the study)

Work needed to enhance CIT gap estimation

The top-down estimation of the CIT gap provides an initial evaluation of the level and change in taxpayers' compliance; however, the results need careful interpretation and further work on improving the application of the methodology is needed.

More detailed statistical data is required to improve the results. The gross operating surplus data used in the estimation needs to be obtained at a more detailed sector of activity level. More information on the proportion of GOS from non-corporate income tax filers is also needed.

Better classification of businesses sector of activity is needed. Feedback on the classification by Statistics Sweden of businesses activity code and institutional sector codes is needed. The relative method gap estimates in particular are being biased upwards due to differences in the classification of activity codes used.

More information on how taxpayers are using the tax declaration lines is needed to improve the results. The methodology employed requires being able to clearly distinguish between operating revenues and costs and all other revenues and costs. Taxpayers may be reporting mixed values on some of the lines of the declaration.

In order to measure the full compliance gap, an effort to accrue tax arrears should be made. Some simple assumptions regarding allocations could be made for this purpose.

A bottom-up approach to estimate CIT gap is recommended to complement the top-down RA-GAP approach. A bottom-up approach, which estimates gaps by using results of random/operational audits, will provide valuable information, and will complement the top-down estimates. It is recommended to use both the top-down and the bottom-up results, combined with internal knowledge and information about taxpayers' compliance, to strengthening compliance risk management in the tax administration.

I. BACKGROUND

1. The IMF's RA-GAP (Revenue Administration Gap Analysis Program) provides a comprehensive quantitative analysis of the tax gap between potential revenues and actual collections. The program is conducted by the Revenue Administration Divisions of the Fiscal Affairs Department and aims to provide an evaluation of tax gap for a specific tax. This report is part of a pilot program to extend this framework to cover Corporate Income Tax (CIT).

2. The main purpose of this report is to provide the estimates of the compliance gap for CIT by applying the methodology of the RA-GAP. The RA-GAP methodology for CIT gap is based on a top-down approach, estimating the potential tax base and revenues from macroeconomic data with consideration for the theoretical differences between the coverage of statistical macroeconomic data and the actual tax base of CIT, and then comparing the estimated results with actual declarations and revenues. It has the advantage of using available data without additional costs of collection, and allows for an evaluation of overall CIT noncompliance in a country. The model and methodology used in assessing the GIT gap are detailed in Appendix II. [1]

3. There are several caveats for the top-down estimation of the CIT gaps. In this report, the potential CIT liability is not associated with the concept of 'tax capacity' showing the maximum level of revenue achieved by changing tax policies, including raising statutory rate. The estimated gaps do not consider behavioral changes by taxpayers under different policies and administrative measures, assuming a static model, and therefore indicate the efficiency of tax administration and policy, rather than show potential additional revenues. It is also important to note that the potential CIT base is estimated from national accounts data and does not consider CIT base in a country before the effects of cross-border base erosion and profit shifting (BEPS) activities of multinational enterprises, unless national accounts data incorporate the adjustments for these effects.

A. Main Features of CIT in Sweden

4. There were no significant policy or rate changes in the CIT during the period covered under this study. The analysis covers the period 2013-2018. The rate did change from 2012 to 2013 and so in the first year in the period covered under this report, the effective rate is higher than the statutory, as any business with a fiscal year which differs from the calendar year would have tax obligations at the two rates for different periods during the year. The main feature of the CIT policy on corporate profit is outlined below:

[1] For a more complete discussion of the RA-GAP approach to estimating the tax gap for corporate income tax see Ueda, 2018.

- **Rate:** A flat rate of 22 percent is applied to taxable income from 2013 to 2018. A flat rate of 26.3 percent applied from 2009 through 2012. The rate was again reduced for 2019 to 21.4 percent (Figure 4).

- **Coverage:** Legal entities carrying out business in Sweden are liable to corporate income tax. Local (resident) legal entities are taxed on their worldwide income, whereas foreign legal entities are taxed on Sweden-source income only.

- **Tax base:** Taxable income is determined by transforming financial accounting results (profit/loss) with adjustments for permanent and temporary differences for tax purposes. Taxable capital gains are added to the other business income.

- **Exemptions:** No exemptions apply. All legal entities are liable to CIT.

- **Losses:** Tax losses may be carried forward indefinitely to be offset against future taxable profits. The carryback of losses is not allowed. Restrictions apply for change in ownership.

- **Threshold:** There is no quantitative threshold for registration. There is a threshold for liability however; there is no requirement to pay tax on taxable income under two hundred Swedish kronor.

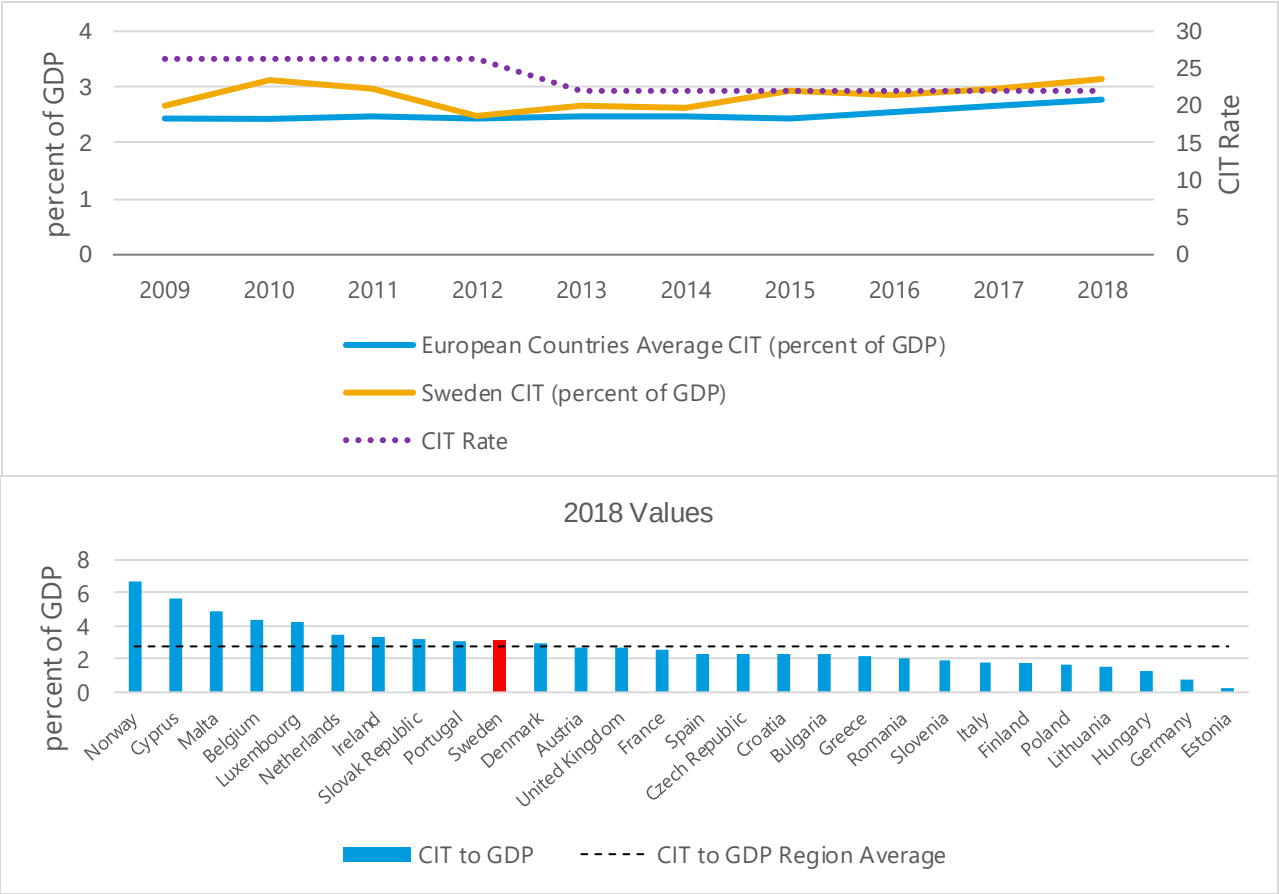
- **Tax period:** The tax period for determining the corporate income tax is depending on when the company financial year ends. Accordingly, the annual corporate tax return must be submitted by the first of November, the 15th of December, the first of March or the first of July. If the financial year follows the calendar year, tax returns are due by the first of July. The corporate tax liability must be paid by 90 days after the final tax assessment issued by the STA.

- **Advance payments:** Taxable legal persons make monthly advance payments for corporate tax which are determined by a preliminary tax assessment. The preliminary prognosis of tax revenue for the current year is based on the latest final tax assessment or on the preliminary return filed by the company.

B. Revenue Performance of CIT

5. Compared to the average of European countries, CIT collection on net basis relative to GDP has been slightly higher than average for the past decade (Figure 4). The level has been around 3 percent of GDP for most years, although it was a little lower in 2009, and for the period 2012 to 2015. The decrease in the CIT rate did not appear to have any substantive affect on revenue performance, with the level in 2018 being equal to the level in 2010, prior to the rate reduction.

Figure 4. CIT Revenue to GDP Ratio, with Comparison to Regional Average

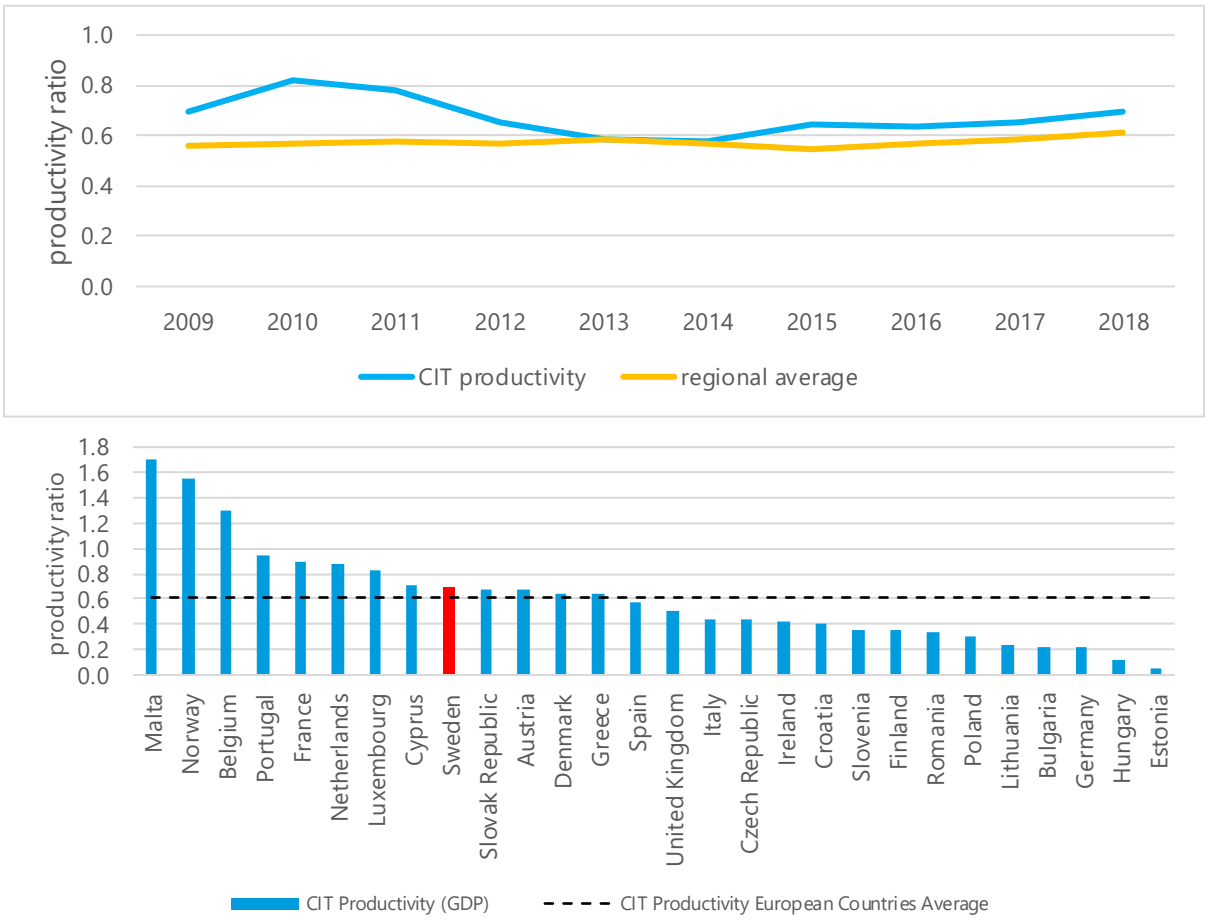


Source: Staff Calculations based on data from WEO, Eurostat, OECD

6. CIT productivity has also been higher than the European average for most of the past decade (Figure 5). The CIT productivity shows how much one percent point CIT statutory rate can generate in CIT revenue relative to GDP, indicating a country's overall efficiency of CIT for revenue mobilization.[1] In 2018, the average of the CIT productivity in Sweden was 0.69 percent, which was higher than the average of European countries of 0.61 percent. During the first few years of the past decade productivity was much higher, before it dropped significantly from 2011 to 2013. Since 2015 productivity has been rising, as has the average level for the region.

[1] The reason for the high CIT productivity could be that the relatively low flat rate the provides business entities with incentives to incorporate, which means the higher CIT productivity can be at the cost of reducing personal income tax base compared with other countries.

Figure 5. CIT Productivity, with Comparison to Regional Average



Source: Staff calculations based on data from Eurostat

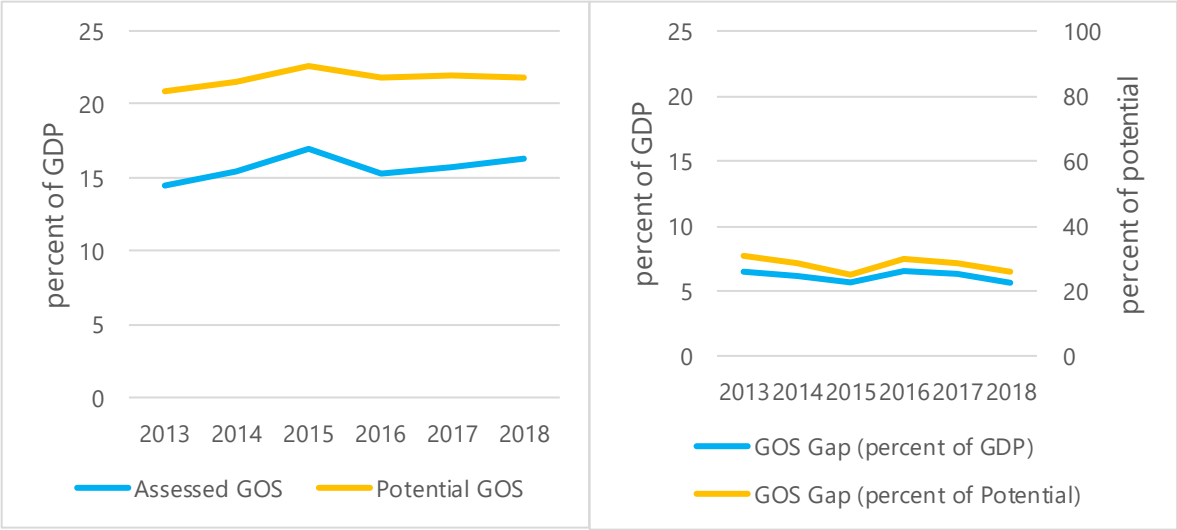
III. THE ESTIMATES

A. The GOS Gap

7. The GOS gap is the difference between the potential GOS, derived from national accounts, and the assessed GOS, derived from the tax declarations. The concept and measures of GOS are the foundation upon which the compliance gap estimates are built. The underlying assumption is that there is a strong relationship between the CIT tax base and GOS.[1] Given this relationship the trends and levels in the GOS are an important indicator of what might be influencing the trends and levels of the compliance gap.

8. The GOS gap appears to have declined slightly over the period, as a percent of GDP and as a percent of potential (Figure 6). The decline has not been smooth. While there appeared to be a notable decrease from 2013 to 2015, the gap then appears to have returned to its 2013 levels before declining again. Some of this volatility in the trend could be due to differences in the timing of recorded underlying economic activity in the national accounts data versus the tax record data, and not reflect real volatility in the gap trend. This issue can arise because many CIT taxpayers use fiscal years different from the calendar year, and so in both sets of data some assumptions must be made as to which calendar year to record this fiscal year sourced data.

Figure 6. GOS, and the GOS Gap

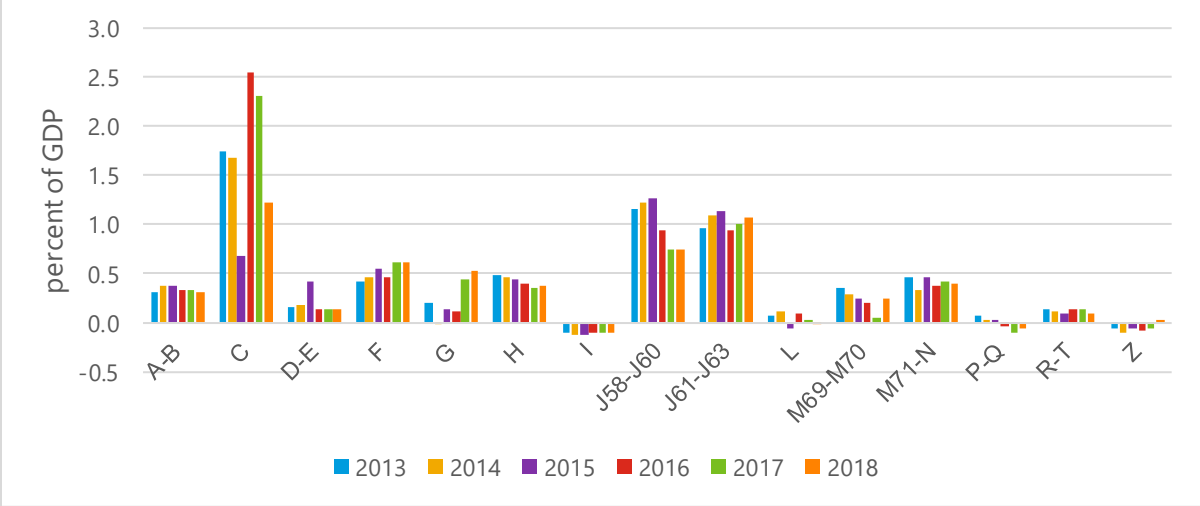


Source: Staff calculations based on data from Statistics Sweden and Skatteverket

[1] It would of course be prudent to examine the strength of this relationship statistically, but, unfortunately, a sufficient time series of data on the structure of the tax base could not be compiled.

9. The GOS gap appears to be largely concentrated in the manufacturing sector, but with significant contributions from the media, telecommunications and information service sectors as well (Figure 7). Unfortunately, a more detailed breakdown of the GOS in the manufacturing sector was not available at the time of the preparation of this report, so it is not certain if the gap for other manufacturing is concentrated in a particular sub-sector, or widespread throughout the sector. Of note is the large drop in the GOS gap for manufacturing in 2015, which would be associated with the much larger spike in the assessed GOS for 2015 as compared to potential GOS, as shown in Figure 6. Other sectors with GOS gaps of note would be the "J" sectors; publishing, media, telecommunications, and information service sectors. The gap in these sectors is perhaps of more significance, and more worthy of further investigation, than the gap in the manufacturing sector because these sectors tend to be more concentrated than the broad manufacturing sector, and so the gap is being created over fewer taxpayers.

Figure 7. The GOS Gap by Sector



Code	Description	Code	Description
A-B	Agriculture, mining	J61-J63	Telecommunications and Information technology services
C	Manufacturing	L	Real estate services
D-E	Electricity, water	M69-M70	Legal, head offices services
F	Construction	M71-N	Other business, professional services
G	Trade services	P-Q	Public administration, education, health care
H	Transportation services	R-T	Other activities
I	Hospitality services	Z	Taxpayers without sector codes
J58-J60	Publishing, media services		

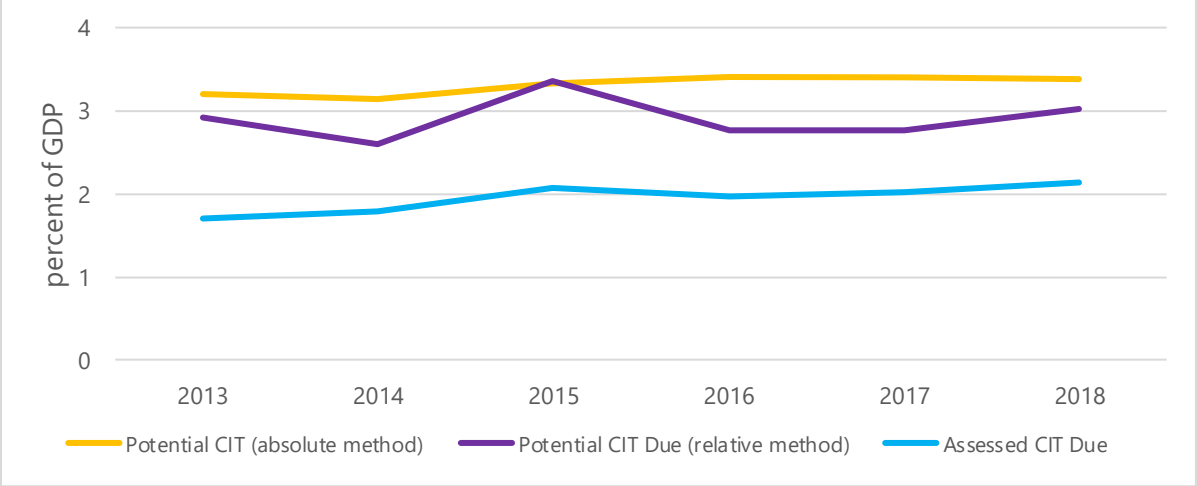
Source: Staff calculations based on data from Statistics Sweden and Skatteverket

B. Actual vs Potential CIT

10. As the compliance gap is the difference between actual and potential revenue, where actual revenue is measured on an accrual basis, comparing actual CIT to potential CIT can give an indication where changes in the compliance gap may be arising. Knowing if changes in the compliance gap are being driven by changes in tax being declared and paid by taxpayers, or by changes in the economic activity being measured can provide insight into what factors might be affecting the change in the gap.

11. Assessed CIT exhibits a slight increase over the period, while the overall trend for the potential is flatter (Figure 8). There are some slight differences in the trends for the two potential CIT values, but of greater note is that their levels are almost identical. As discussed above, in general it would be expected that the absolute method should produce a higher estimate than the relative method. In this case, issues in the execution of the relative method are causing it to be over-estimated. However, in comparing the trends in the three series, it is notable that both the assessed CIT and relative method potential show a spike in their values in 2015, the potential under the absolute method shows a relatively stable trend. In general, the relative method presents a much more volatile series, which is likely more due to data issues than being reflective of taxable economic activity.

Figure 8. Assessed vs Potential CIT

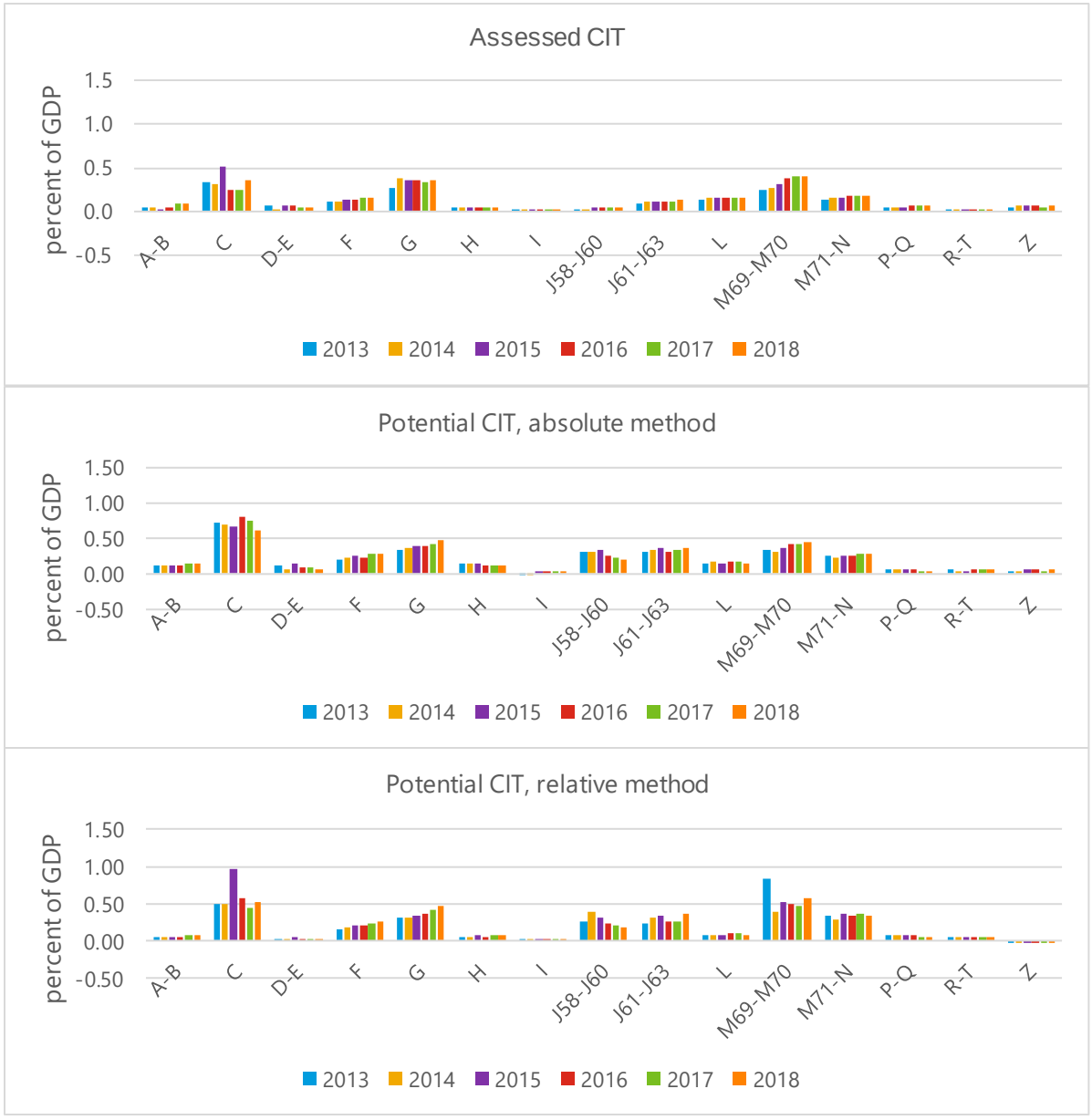


Source: Staff calculations based on data from Statistics Sweden and Skatteverket

12. The potential CIT under the relative method more closely matches the general distribution of assessed CIT, while the absolute method shows more dominance by the manufacturing sector (Figure 9). Assessed CIT, and the potential CIT using the relative method, shows that the bulk of CIT comes from three main sectors, and almost on an equal share; manufacturing, trade services, and head office services. The potential CIT estimated using the absolute method, indicates a distribution where manufacturing is the predominant sector. There are two notable spikes in the potential CIT under the relative method – in the head offices sector

in 2013, and in the manufacturing sector in 2015. These are the sources of the two spikes in the overall trend line, and are likely due to either timing differences between the statistical data and the tax record data, or anomalous, one-off transactions which are distorting the ratios used in the relative method. Another possible cause could be if there is income being passed between non-financial institution and financial institution members of a group of companies, which would make a neutral financial transaction appear to either be a net gain or loss.

Figure 9. Assessed and Potential CIT by Sector



Code	Description	Code	Description
A-B	Agriculture, mining	J61-J63	Telecommunications and Information technology services
C	Manufacturing	L	Real estate services
D-E	Electricity, water	M69-M70	Legal, head offices services
F	Construction	M71-N	Other business, professional services
G	Trade services	P-Q	Public administration, education, health care
H	Transportation services	R-T	Other activities
I	Hospitality services	Z	Taxpayers without sector codes
J58-J60	Publishing, media services		

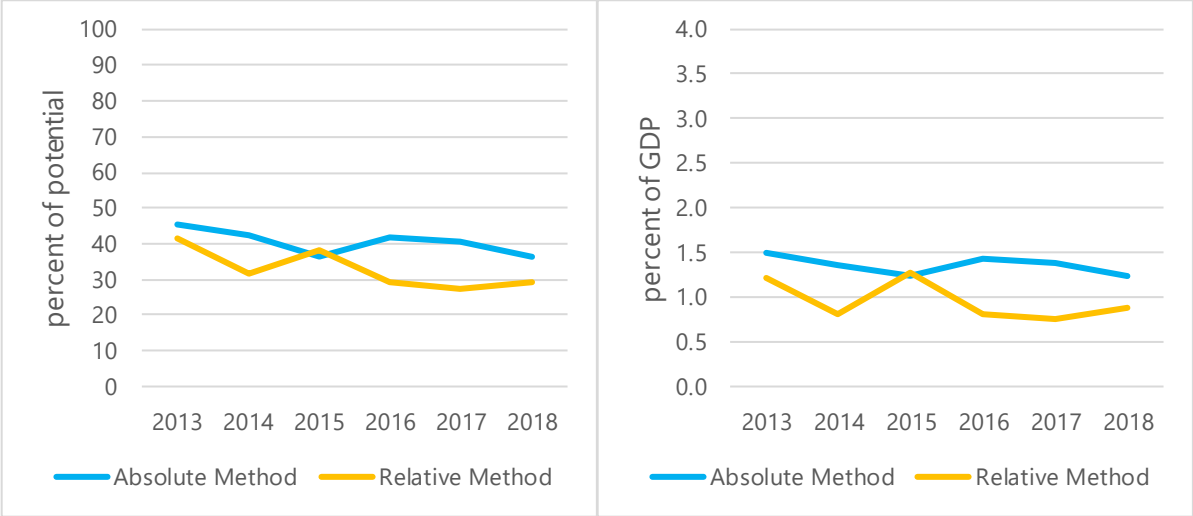
Source: Staff calculations based on data from Statistics Sweden and Skatteverket

C. The Compliance Gap

13. Without data for accrued revenue, or accrued arrears, the full compliance gap cannot be estimated, only the assessment gap. As noted above, this is not unusual in the case of the CIT. It should be noted, however, that work is being undertaken to construct such a series.

14. The assessment gap appears to have been falling (Figure 10). While both methods show a declining trend over the whole period, there is a stark difference for 2015, where there is a spike in the value under the relative method, and a trough for the absolute method. This is the result of the differences in the values of potential and assessed CIT for the manufacturing sector (figure 9, above) where there is a slight spike in the assessed value for 2015, but no spike in the absolute method and an even bigger spike for the relative method. This is a distortion resulting from a single large assessment levied in 2015. This assessment is all being attributed to assessed CIT for 2015 even though the assessment is likely due to an audit for activities for multiple years, and so should really be reflected as smaller incremental increases over a longer period. It should also be noted that the value for the gap in 2013 under the relative method is likely being overstated, which is related to the spike in the value for the potential under the relative method for the head office sector in 2013, so the overall trend, while declining, is not declining quite as steeply as the current values indicate, but likely in line with the trend exhibited by the absolute method estimate.

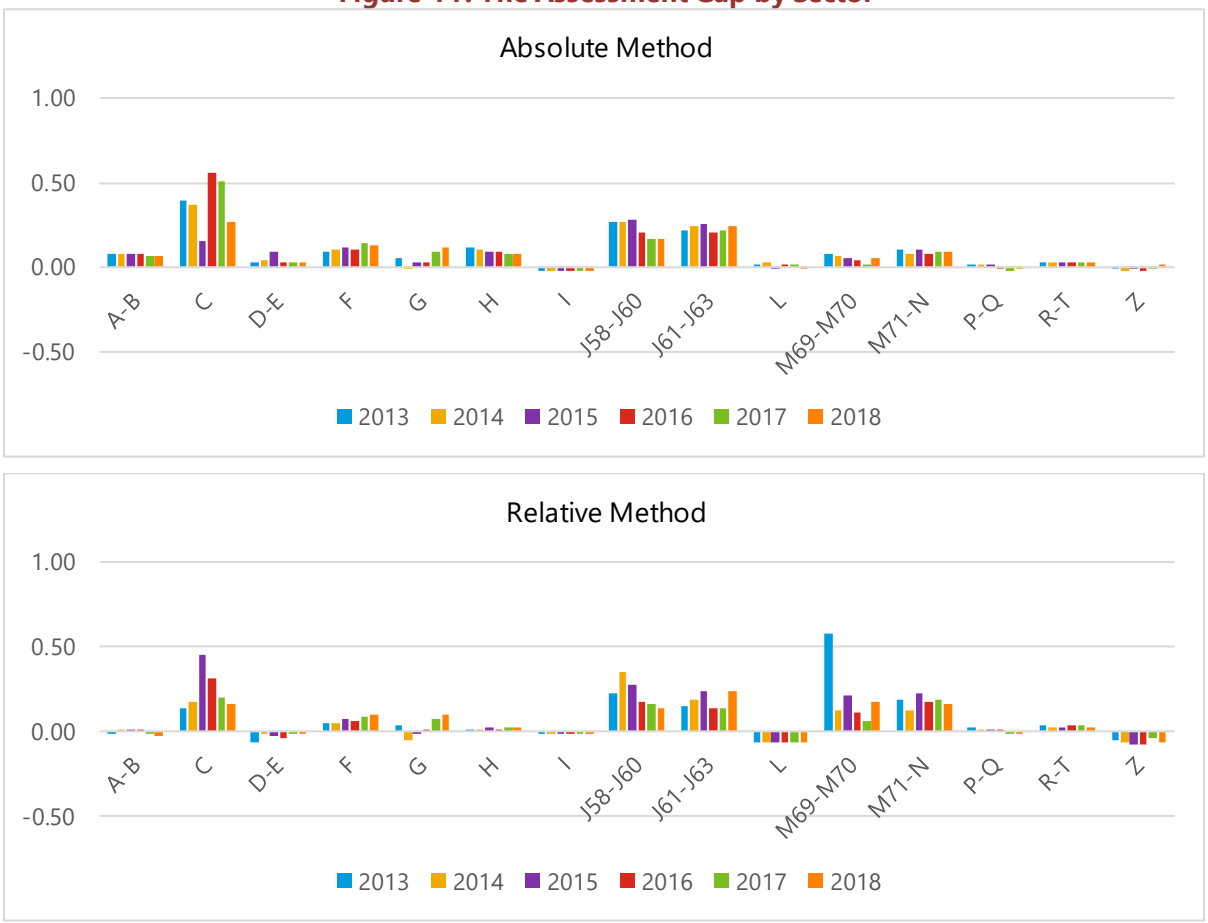
Figure 10. The Assessment Gap



Source: Staff calculations based on data from Statistics Sweden and Skatteverket

15. Both methods indicate that the bulk of the assessment gap is in the same sectors where the GOS gap is appearing; manufacturing, media, telecommunications, and information services (Figure 11). The relative method clearly indicates the impact of the spike in the assessed CIT for 2015, with a corresponding divot in the assessment gap, whereas the absolute method is showing a contrasting spike for 2014, the result of the spike in assessed CIT but no spike in potential. There is a notable difference in the negative being associated with legal, head office and other professional service sectors (the "M" and "N" sectors); the relative method indicates the gap in these sectors could have been as large as the gap in the "C" an "J" sectors in certain years, while there is no significant gap in the absolute method. However, the higher volatility in the "M" and "N" sector results is an indication that there could be timing issues in the data influencing these results.

Figure 11. The Assessment Gap by Sector



Code	Description	Code	Description
A-B	Agriculture, mining	I	Hospitality services
C1	Electronics Manufacturing	J	Information and communication
C2	Other Manufacturing	L	Real estate services
D-E	Electricity, water	M-N	Professional, Administrative Services
F	Construction	P-Q	Education, health care
G	Trade services	R-S	Arts, entertainment services
H	Transportation services	Z	Taxpayers without sector codes

Source: Staff calculations based on data from Statistics Sweden and Skatteverket

IV. OBSERVATIONS AND NEXT STEPS

A. Observations

16. Some significant assumptions were needed to be made to enable the RA-GAP estimation of potential CIT base and liability; therefore, CIT gap estimates should be interpreted with caution. The definition for "non-financial corporations" used in national accounts includes some unincorporated enterprises, so there is not a perfect match to the corporate income tax base. Some assumptions had to be made as to the impact of these differences, which may be affecting both the level and trend in the resulting gap estimates. There is also an issue with the tax declaration data; the methodology requires being able to fully distinguish between operating revenues and costs and other revenues and costs from the declaration data, but the current tax declaration has some lines which might be blending operating and capital costs.

17. The current estimates are believed to over-estimate the CIT assessment gap, possibly significantly. There are issues with both the available statistical data and the tax record data that are likely leading to an overestimation of the assessment gap. In particular more information is needed on the degree to which GOS in the national accounts includes value from entities who are not required to file for, or pay, corporate income tax. These inclusions lead to an overestimation of the gap and could also be affecting the trends in the gap. Regarding the tax records, more clarity is needed on how taxpayers are using some of the cost reporting lines. It is believed that some capital costs are being recorded by taxpayers in some of the "other cost" line items on the declaration, which would lead to an under-estimation of assessed GOS, and so an over estimation of the gap.

B. Next Steps

18. The following actions are necessary to improve the current estimates:

- Obtain more information on the value in the national accounts GOS for non-financial corporations which is coming from entities not required to file or pay CIT.
- Obtain a more detailed and current breakdown of GOS for non-financial corporations by sector of economic activity.
- Obtain the sector of economic activity and institutional sector codes for all businesses which Statistics Sweden is using.
- Attempt to construct a measure of either accrued CIT or accrued CIT arrears.
- Obtain information on the degree to which capital costs might be getting included in the "other cost" line items on the CIT declaration form.

Appendix I. Data Tables for Included Figures

Table 1. Data for Figure 1, 8: Assessed vs Potential CIT

Year	Assessed CIT Due	Potential CIT (absolute method)	Potential CIT (relative method)
2013	1.70	3.2	2.91
2014	1.78	3.1	2.60
2015	2.08	3.3	3.36
2016	1.96	3.4	2.77
2017	2.01	3.4	2.76
2018	2.13	3.4	3.02

Table 2. Data for Figure 2, 10: The Assessment Gap

Year	Absolute Method Percent of Potential	Absolute Method Percent of GDP	Relative Method Percent of Potential	Relative Method Percent of GDP
2013	45.39	1.50	41.50	1.21
2014	42.11	1.36	31.54	0.82
2015	36.38	1.24	38.02	1.28
2016	41.83	1.44	29.19	0.81
2017	40.46	1.39	27.35	0.76
2018	36.34	1.24	29.32	0.89

Table 3. Data for Figure 3, 11: The Assessment Gap Absolute Method by Sector

Reporting Sector Code	2013	2014	2015	2016	2017	2018
A-B	0.07	0.08	0.08	0.08	0.07	0.07
C	0.40	0.37	0.15	0.56	0.51	0.27
D-E	0.03	0.04	0.09	0.03	0.03	0.03
F	0.10	0.10	0.12	0.10	0.14	0.14
G	0.05	0.00	0.03	0.03	0.10	0.12
H	0.11	0.10	0.10	0.09	0.08	0.08
I	-0.02	-0.02	-0.03	-0.02	-0.02	-0.02
J58-J60	0.26	0.27	0.28	0.21	0.16	0.16
J61-J63	0.22	0.24	0.25	0.21	0.22	0.24
L	0.02	0.02	-0.01	0.02	0.00	0.00
M69-M70	0.08	0.06	0.06	0.05	0.01	0.06
M71-N	0.11	0.07	0.10	0.08	0.09	0.09
P-Q	0.02	0.01	0.00	-0.01	-0.02	-0.01
R-T	0.03	0.03	0.02	0.03	0.03	0.02
Z	-0.01	-0.02	-0.01	-0.02	-0.01	0.00

Table 4. Data for Figure 3, 11: The Assessment Gap Relative Method by Sector

Reporting Sector Code	2013	2014	2015	2016	2017	2018
A-B	-0.02	0.01	0.01	0.00	-0.02	-0.02
C	0.14	0.17	0.45	0.31	0.20	0.16
D-E	-0.06	0.00	-0.03	-0.04	-0.02	-0.02
F	0.04	0.05	0.07	0.06	0.09	0.10
G	0.04	-0.05	-0.01	0.01	0.07	0.10
H	0.01	0.01	0.02	0.02	0.02	0.02
I	-0.01	-0.01	-0.02	-0.01	-0.02	-0.02
J58-J60	0.23	0.35	0.27	0.18	0.16	0.14
J61-J63	0.15	0.19	0.24	0.13	0.14	0.23
L	-0.06	-0.07	-0.07	-0.07	-0.07	-0.07
M69-M70	0.58	0.12	0.21	0.12	0.06	0.17
M71-N	0.19	0.12	0.22	0.17	0.18	0.16
P-Q	0.02	0.01	0.01	0.00	-0.01	0.00
R-T	0.03	0.03	0.03	0.03	0.03	0.03
Z	-0.06	-0.06	-0.08	-0.07	-0.05	-0.07

Table 5. Data for Figure 4: CIT Revenue to GDP Ratio in Finland, with Comparison to Regional Average

Year	CIT to GDP	CIT to GDP European Countries Average	CIT Rate
2009	2.65	2.44	26.3
2010	3.12	2.43	26.3
2011	2.98	2.49	26.3
2012	2.48	2.43	26.3
2013	2.67	2.49	22
2014	2.62	2.46	22
2015	2.95	2.44	22
2016	2.88	2.54	22
2017	2.97	2.65	22
2018	3.15	2.78	22

Table 6. Data for Figure 4: CIT Revenue to GDP Ratio in Finland, with Comparison to Regional Average

Year	CIT to GDP	CIT to GDP Region Average
Norway	6.73	2.78
Cyprus	5.72	2.78
Malta	4.86	2.78
Belgium	4.37	2.78
Luxembourg	4.29	2.78
Netherlands	3.52	2.78
Ireland	3.37	2.78
Slovak Republic	3.26	2.78
Portugal	3.16	2.78
Sweden	3.15	2.78
Denmark	2.92	2.78
Austria	2.72	2.78
United Kingdom	2.65	2.78
France	2.59	2.78
Spain	2.31	2.78
Czech Republic	2.30	2.78
Croatia	2.29	2.78
Bulgaria	2.26	2.78
Greece	2.18	2.78
Romania	2.08	2.78
Slovenia	1.91	2.78
Italy	1.86	2.78
Finland	1.75	2.78
Poland	1.64	2.78
Lithuania	1.56	2.78
Hungary	1.25	2.78
Germany	0.76	2.78
Estonia	0.29	2.78

Table 7. Data for Figure 5: CIT Productivity in Finland, with Comparison to Regional Average

Year	CIT Productivity	Regional Average CIT Productivity
2009	0.70	0.56
2010	0.82	0.57
2011	0.78	0.58
2012	0.65	0.57
2013	0.59	0.58
2014	0.58	0.57
2015	0.65	0.55
2016	0.63	0.57
2017	0.65	0.59
2018	0.69	0.61

Table 8. Data for Figure 5: CIT Productivity in Finland, with Comparison to Regional Average, 2018

Year	CIT Productivity	CIT Productivity Region Avg
Malta	1.70	0.61
Norway	1.55	0.61
Belgium	1.29	0.61
Portugal	0.95	0.61
France	0.89	0.61
Netherlands	0.88	0.61
Luxembourg	0.83	0.61
Cyprus	0.71	0.61
Sweden	0.69	0.61
Slovak Republic	0.68	0.61
Austria	0.68	0.61
Denmark	0.64	0.61
Greece	0.63	0.61
Spain	0.58	0.61
United Kingdom	0.50	0.61
Italy	0.45	0.61
Czech Republic	0.44	0.61
Ireland	0.42	0.61
Croatia	0.41	0.61
Slovenia	0.36	0.61
Finland	0.35	0.61
Romania	0.33	0.61
Poland	0.31	0.61
Lithuania	0.23	0.61
Bulgaria	0.23	0.61
Germany	0.23	0.61
Hungary	0.11	0.61
Estonia	0.06	0.61

Table 9. Data for Figure 6: GOS, and the GOS Gap

Year	Assessed GOS	Potential GOS	GOS Gap (percent of GDP)	GOS Gap (percent of Potential)
2013	14.5	20.9	6.4	30.8
2014	15.4	21.6	6.2	28.7
2015	17.0	22.6	5.6	25.0
2016	15.3	21.8	6.5	29.9
2017	15.6	22.0	6.3	28.8
2018	16.2	21.9	5.6	25.7

Table 10. Data for Figure 7: The GOS gap percent of GDP by Sector

Reporting Sector Code	2013	2014	2015	2016	2017	2018
A-B	0.3	0.4	0.4	0.3	0.3	0.3
C	1.7	1.7	0.7	2.6	2.3	1.2
D-E	0.2	0.2	0.4	0.1	0.1	0.1
F	0.4	0.5	0.6	0.5	0.6	0.6
G	0.2	0.0	0.1	0.1	0.4	0.5
H	0.5	0.5	0.4	0.4	0.3	0.4
I	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
J58-J60	1.2	1.2	1.3	1.0	0.7	0.7
J61-J63	1.0	1.1	1.1	0.9	1.0	1.1
L	0.1	0.1	-0.1	0.1	0.0	0.0
M69-M70	0.4	0.3	0.3	0.2	0.1	0.3
M71-N	0.5	0.3	0.5	0.4	0.4	0.4
P-Q	0.1	0.0	0.0	0.0	-0.1	0.0
R-T	0.1	0.1	0.1	0.1	0.1	0.1
Z	-0.1	-0.1	-0.1	-0.1	0.0	0.0

Table 11. Data for Figure 9: Assessed and Potential CIT by Sector, Assessed CIT percent of GDP

Row Labels	2013	2014	2015	2016	2017	2018
A-B	0.1	0.0	0.0	0.0	0.1	0.1
C	0.3	0.3	0.5	0.3	0.3	0.4
D-E	0.1	0.0	0.1	0.1	0.1	0.0
F	0.1	0.1	0.1	0.1	0.1	0.1
G	0.3	0.4	0.4	0.4	0.3	0.4
H	0.0	0.0	0.0	0.0	0.0	0.0
I	0.0	0.0	0.0	0.0	0.0	0.0
J58-J60	0.0	0.0	0.0	0.0	0.1	0.0
J61-J63	0.1	0.1	0.1	0.1	0.1	0.1
L	0.1	0.2	0.2	0.2	0.2	0.2
M69-M70	0.2	0.3	0.3	0.4	0.4	0.4
M71-N	0.1	0.2	0.2	0.2	0.2	0.2
P-Q	0.0	0.1	0.1	0.1	0.1	0.1
R-T	0.0	0.0	0.0	0.0	0.0	0.0
Z	0.1	0.1	0.1	0.1	0.0	0.1

Table 12. Data for Figure 9: Assessed and Potential CIT by Sector, Potential CIT absolute method percent of GDP

Year	2013	2014	2015	2016	2017	2018
A-B	0.13	0.12	0.12	0.11	0.16	0.16
C	0.74	0.69	0.66	0.82	0.76	0.62
D-E	0.11	0.08	0.16	0.10	0.08	0.08
F	0.21	0.22	0.25	0.24	0.29	0.28
G	0.33	0.37	0.38	0.38	0.43	0.47
H	0.15	0.14	0.14	0.13	0.12	0.13
I	0.00	0.00	0.00	0.01	0.01	0.01
J58-J60	0.30	0.30	0.33	0.26	0.22	0.21
J61-J63	0.31	0.35	0.36	0.33	0.34	0.37
L	0.15	0.17	0.14	0.18	0.16	0.15
M69-M70	0.33	0.32	0.36	0.42	0.42	0.45
M71-N	0.25	0.23	0.26	0.26	0.27	0.28
P-Q	0.06	0.06	0.06	0.06	0.04	0.05
R-T	0.05	0.05	0.05	0.05	0.06	0.06
Z	0.04	0.04	0.06	0.06	0.04	0.07

Table 13. Data for Figure 9: Assessed and Potential CIT by Sector, Potential CIT relative method percent of GDP

Year	2013	2014	2015	2016	2017	2018
A-B	0.04	0.04	0.04	0.04	0.07	0.06
C	0.48	0.48	0.96	0.56	0.45	0.52
D-E	0.02	0.03	0.04	0.03	0.03	0.03
F	0.15	0.17	0.20	0.19	0.24	0.24
G	0.32	0.32	0.35	0.36	0.41	0.45
H	0.05	0.05	0.06	0.06	0.06	0.06
I	0.01	0.01	0.01	0.02	0.01	0.02
J58-J60	0.27	0.38	0.32	0.22	0.21	0.19
J61-J63	0.24	0.30	0.34	0.25	0.26	0.36
L	0.07	0.08	0.09	0.09	0.09	0.08
M69-M70	0.82	0.38	0.52	0.49	0.47	0.57
M71-N	0.33	0.28	0.37	0.35	0.36	0.35
P-Q	0.06	0.06	0.06	0.07	0.05	0.06
R-T	0.05	0.05	0.05	0.06	0.06	0.06
Z	0.00	0.00	-0.01	0.00	0.00	0.00

Appendix II. The Model and Methodology used to Estimate the CIT Gap

1. The IMF's RA-GAP (Revenue Administration – Gap Analysis Program) methodology for CIT gap is based on the top-down approach. This aims to estimate the potential CIT base and liability from existing macroeconomic data, with thorough considerations for theoretical differences between the macroeconomic data and the actual tax base of CIT, and then compare the estimated results with actual declarations and payments.

2. The top-down approach requires a basic condition: that the macroeconomic data are compiled independently of the assessed tax base and liability. In Finland, national accounts data are compiled by Finland Statistics using various statistical surveys, annual accounts of economic units and administrative data. Tax declarations are not the initial source of determining production, value-added, and operating surplus in the national accounts. As a result, the basic condition for conducting the top-down approach is being met.

Theoretical Framework for Estimation

3. The general approach used in the RA-GAP top -down CIT gap estimation involves using Gross operating surplus (GOS) of corporations in national accounts as a starting point for estimating the potential CIT base in a country. A detailed discussion about how GOS from the national accounts can be used to estimate potential CIT is provided in Ueda 2018[4]

4. The RA-GAP framework applies three different concepts of CIT base to allow careful consideration of treating the results of loss-making corporations and deductions for carried-over losses.

- ***Current-year net tax base*** (C-NTB): An aggregated result for the current year reflecting both profit-making corporations and loss-making corporations.
- ***Current-year tax base*** (C-TB): An aggregated result for the current year of profit-making corporations only; this is before deducting carried-over losses. C-TB is generally bigger than C-NTB because losses made by loss-making corporations are netted out from aggregate profits in C-NTB, but not deducted in C-TB.
- ***Tax base*** (TB): An aggregate result for the current year of profit-making corporations only, after deducting carried-over losses from previous years. This is the base for calculating aggregate CIT liability in a year.

[4] Ueda, Junji, 2918, "Estimating the Corporate Income Tax Gap: The RA-GAP Methodology", IMF Technical Notes and Manuals

5. In theory, estimation of the potential CIT base starts from GOS and would then need to make appropriate adjustments to reflect conceptual differences from the potential CIT tax base and liabilities. There are many conceptual differences between GOS and the actual tax base (TB) of CIT, that can be classified into three categories D1, D2 and D3

- [D1] differences between GOS in national accounts and aggregate financial accounting profit (FAP) of CIT taxpayers
- [D2] differences between aggregate FAP and aggregate current year net tax base (C-NTB)
- [D3] differences between aggregate C-NTB and aggregate tax base (TB) due to losses and deductions for carry-over losses

6. By adjusting GOS by the estimates for D1, D2 and D3, the potential tax base could then be estimated. The sequence of estimating steps for the potential CIT base and liability is shown in the left-side flow in Figure 1, including the concepts of potential FAP, potential C-NTB, potential C-TB, and potential TB. Then the potential CIT liability is calculated by applying the statutory CIT rate to the potential TB and reflecting tax credits and additional tax liabilities that are not proportional to the tax base.

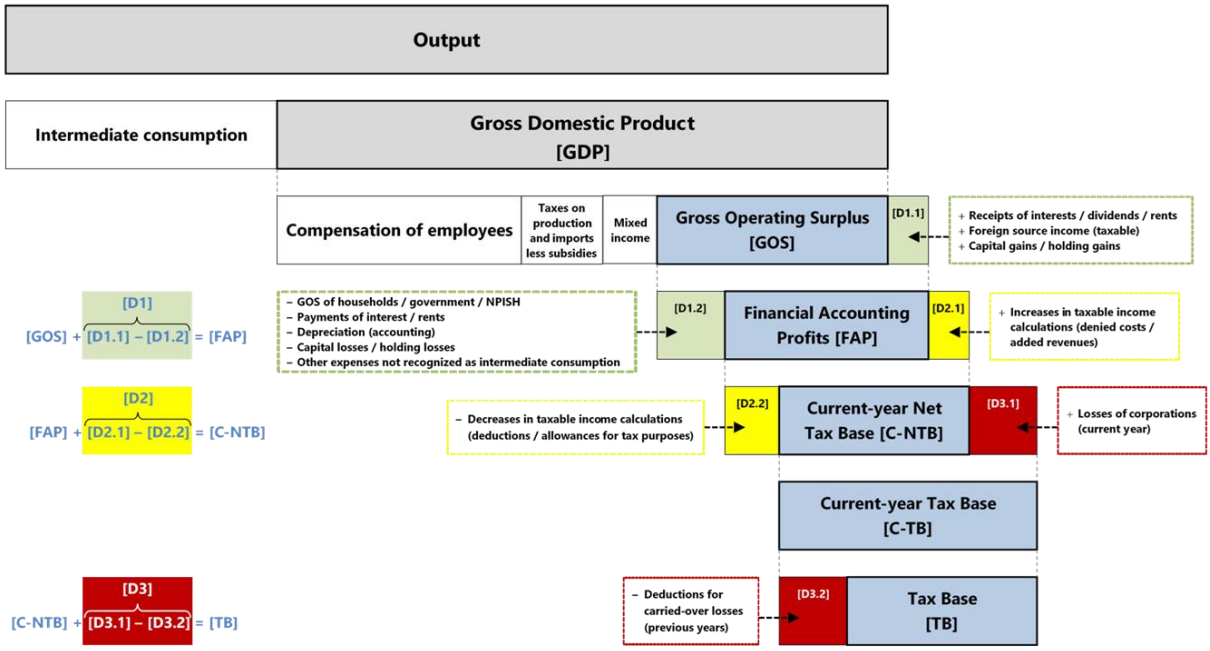
7. The framework also limits the scope of the estimation to non-financial corporations. The reason for excluding financial corporations is that estimating the potential CIT base by using national accounts data is more difficult for financial corporations since their income is not as closely associated to the concept of gross operating surplus.[5] As such, the basic premise of this framework is not applicable for these types of enterprises.

8. It should be noted that the top-down estimates for CIT gaps do not try to directly measure or include the magnitude of tax avoidance or BEPS (base erosion and profit shifting) of corporations. The estimated gap does not show how much national income, that should have been sourced in a country, are transferred to other countries by legal means because such activities are usually reflected in national accounts data as well.[6] It should be noted that the top-down approach relies on what is actually measured in national accounts data.

[5] For financial corporations, the economic value-added, calculated as the financial intermediation services (FISIM) and the net insurance premiums, can be significantly different from their taxable incomes reflecting capital gains/losses and changes in financial reserves, and therefore a completely different approach would be needed to apply a top-down to provide appropriate estimates.

[6] See OECD, 2015 in detail.

Figure 1. Theoretical Relationship between GOS and CIT Tax Base



Source: RA-GAP analytical framework for CIT gap.

Practical Application of the Framework

9. A complete set of Independent data on the values needed to adjust GOS to arrive at C-NTB are not available. While some statistics do provide general indications of the values of some of these items, as described as D1 and D2 above, the definitions used for these statistics are not necessarily the same as the definitions of these items for tax purposes. The use of these statistics would therefore require many assumptions and adjustments to ensure that their use does not result in an overestimation or underestimation of the potential tax base. Furthermore, for some of the needed adjustments, no pertinent statistical data is available at all. In such cases, the only possible source of relevant data would have to come from tax declaration data. As such, attempting a direct application of the theoretical framework requires making use of a combination of tax record data and statistical data. This then requires that further assumptions and adjustments be made to ensure that these two sets of data are consistent with each other, to avoid overlap or under-coverage.

10. A simplified set of methods for obtaining the gap has been employed in order to reduce the number of assumptions that need to be made. Two separate methods have been used to arrive at an estimate of the CIT compliance gap; an *absolute* method, and a *relative* method. The rationale for using two different methods is that both methods have their strength and weaknesses, but these strengths and weaknesses lie in different areas. Comparing the results from the two methods should give a better overall indication of the compliance gap. Both methods rely solely on tax record data to calculate a value for the *Potential Tax Base* (P-TB).

11. The first step under both methods requires obtaining the values for GOS from the national accounts and computing a value for *Assessed Gross Operating Surplus* (A-GOS). GOS from the national accounts will need to be adjusted in order to arrive at *Potential Gross Operating Surplus* (P-GOS). In particular, the GOS for non-financial corporations, by sector of economic activity needs to be requested from the national accounts office. Then, because the national accounts definition for non-financial corporations may include the activities of some entities which are not required to file corporate income tax returns, the GOS from these entities needs to be removed. To calculate A-GOS, data from taxpayer declarations is used to compute each taxpayer's gross operating surplus; their total operating revenue minus their operating costs. Or, as described above, earnings before interest, tax, depreciation and amortization.

12. The absolute method estimates P-TB by using the difference between A-GOS and the *Assessed Tax Base* (A-TB). P-TB using the absolute method (P-TBabs) is determined by subtracting this difference from P-GOS. In other words, the absolute method uses data solely sourced from taxpayer's declarations for the D1-D3 adjustments as described above. This measure for the compliance gap is, obviously, limited in scope. However, despite being limited in scope, this measure will likely over-estimate the compliance gap, and therefore would represent an upper-limit for the compliance gap. Implicitly this method assumes that any undeclared operating surplus would have no associated capital or other costs associated with it. Taxpayers

under-declaring operating surplus could be expected to be scaling back the size of their operations as they appear on the declaration in general. Taxpayers not filing a declaration at all, would also likely have other deductions and inclusions to report in addition to their unreported operating surplus.

13. The relative method estimates P-TB by using the relative size of the *Assessed Current-year Tax Base* (AC-TB) to A-GOS. Specifically, the method calculates the geometric mean of this ratio, using declaration data, for all those taxpayers in a particular sector with both a positive AC-TB and a positive A-GOS. A ratio of the A-GOS for this subset of taxpayers in the sector to the total A-GOS for the sector is also determined. These two ratios are then applied to the P-GOS for the sector, to determine the Potential Current-year Tax Base (PC-TB) for the sector associated with positive P-GOS. This value must then be adjusted to account for the P-TB that would arise from negative P-GOS. Again, declaration data is used to determine the ratio of AC-TB for all taxpayers to the AC-TB of those taxpayers with positive A-GOS. Applying this ratio to the PC-TB for taxpayers with positive P-GOS yields the estimate for the overall PC-TB. Deductions for carried-over losses and adjustments for deferred profits obtained from the declarations are then applied to arrive at P-TBrel, P-TB using the relative method. This approach is based on a simplifying assumption that most taxpayers are compliant, particularly the larger taxpayers.[7] As such, the ratio of the AC-TB to A-GOS will be most heavily influenced by compliant taxpayers, and so applying the ratio to P-GOS we get an estimate for what the C-TB might be if all taxpayers reported in a fashion similar to the compliant taxpayers.

14. Once P-TB has been estimated, the potential CIT (P-CIT) is determined by applying the CIT rate. As there are two values for P-TB, two values for P-CIT are determined; P-CITabs and P-CITrel. In addition, if there are any tax credits applicable then under the absolute method, the amount of credits claimed by taxpayers is subtracted from P-CITabs. Under the relative method, P-CITrel is adjusted by the ratio of the tax credits claimed to the assessed tax payable before credits.

15. The assessment gap is then determined by subtracting assessed CIT (A-CIT) from P-CIT. The assessment gap is the component of the compliance gap that results from underassessed amounts of tax due.

16. To arrive at the compliance gap, the collection gap is added to the assessment gap. The collection gap is the amount of uncollected tax owed for the period in question – in other words the CIT collection gap for 2017 is the amount of CIT owed against amounts assessed as having been due against 2017 tax declarations, but which has not yet been paid. It is not the total amount of CIT owing at the end of 2017, as that could include liabilities which are related to previous years obligations.

[7] This is not to say that there are no CIT revenue issues associated with large taxpayers; those issues are more generally related to BEPS, which this estimation methodology is not attempting to capture.