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The corporate income tax gap in South Africa

A top-down approach

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Abstract: A key objective of many governments is to improve tax revenue mobilization. One way to achieve this is by improving tax compliance. This requires accurate knowledge of the tax gap, i.e. the difference between what should be paid and what is actually paid. Until now, tax gaps have been primarily estimated in developed countries, and very little is known about tax gaps in developing countries. Information about these gaps can help policy makers make appropriate revenue mobilization strategies. This paper uses a top-down approach to estimate the tax gap in corporate income tax in South Africa. It uses national accounts statistics and tax administrative data to estimate the gap in the non-financial corporate sector, i.e. the difference between potential and actual corporate income tax under current tax legislation. The overall gap is estimated at approximately 11 per cent of the potential tax base or 2 per cent of GDP over the period 2015 to 2017.

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1   Introduction

In recent years, given concerns about base erosion and profit shifting and their effect on tax revenue collection, the focus internationally has been on improving tax compliance and increasing tax revenue mobilization (see OECD 2013). Putting strategies in place to achieve this requires accurate knowledge of the tax gap, i.e. the difference between what should theoretically be paid and what is actually paid. At the local level South Africa has experienced increasing fiscal pressure, and low compliance levels have allegedly been of great concern to the tax authorities (see Menon 2018), even though a systematic and verifiable estimate of the gap numbers has not been available. There is renewed interest in and efforts to improve compliance, not only in order to increase tax revenue mobilization but also to ensure that compliant taxpayers perceive the tax system to be fair (National Treasury & SARS 2017: i).

Corporate income tax (CIT) is the third largest source of tax revenue in South Africa. In the 2018/19 fiscal year, the CIT contribution to total tax revenue was 16.6 per cent (down from 18.1 per cent in 2017/18) (National Treasury and SARS 2019: 144). Given the importance of corporate income tax as a revenue source, policy makers need to know and monitor the size and nature of the corporate income tax gap. This paper is a first attempt at estimating the tax gap for corporate income tax in South Africa for the non-financial sector, utilizing a top-down approach. The emphasis is on estimating the compliance gap, i.e. establishing a method of measuring non-compliance by the corporate sector in South Africa. The next section provides a conceptual overview of the tax gap framework. In Section 3 the methodology applied is discussed. The methodology is based on the top-down approach developed by the International Monetary Fund (IMF), which uses a combination of national accounts and tax administrative data (see Ueda 2018). Section 4 discusses the data requirements and Section 5 gives the results of this first estimate of the non-financial CIT gap in South Africa. Section 6 concludes the paper.

This paper provides a first systematic estimate of the CIT gap in the non-financial sector in South Africa using national accounts data and tax administrative data. Given the limitations in the available data (see Sithole et al. 2020), this research should be considered as work in progress towards estimating tax gaps in the corporate sector. It is also a first step towards establishing a framework for estimating the tax gap annually, as an indispensable instrument of tax policy-making.

2   Conceptual framework: the tax gap

An important first step in addressing tax non-compliance is to determine the magnitude of tax evasion and avoidance activities. Estimating the tax gap guides the process of improving tax compliance and increasing revenue mobilization. The UK's HM Revenue and Customs (HMRC 2014) defines the tax gap as the difference between a country's maximum potential tax revenue if all individuals and companies complied with the letter and the spirit of the law, and the actual tax revenue collected. The tax gap is therefore a measure of the extent to which non-compliance takes place and is the 'difference between the amount of tax that should, in theory, be paid […] and what is actually paid' (HMRC 2018: 3). According to Toro et al. (2013: 11), the definition explains the difference between the taxes actually paid and what should be paid within the current policy framework.

A broader definition given by the IMF specifies two components of the tax gap. First, there is a gap due to non-compliance by taxpayers given the tax structure and policies (i.e. the compliance gap, which is tantamount to tax evasion); second, there is a gap due to policy choices that reduce tax collection (i.e. the exploitation of a policy gap, which equates to tax avoidance) (Toro et al. 2013: 11). The policy gap arises because of policy provisions allowing deductions, rebates, or exemptions.

2.1 Calculating the tax gap

There are two main approaches to estimating the tax gap, namely a top-down approach and a bottom-up approach. The top-down approach entails the calculation of a single estimate of the tax base, which is then used to determine the theoretical tax liability, i.e. the tax revenue that is collected if taxpayers fully comply with tax legislation (Rubin 2011: 109). The difference between this estimate and the taxes actually collected gives the tax gap. The advantages of this approach are that it gives a single estimate, it uses data sources that are independent of the tax authorities, and it requires fewer resources to determine the tax gap. A downside of this approach is the uncertainty of its estimates, as the gap is based on the difference between estimates of two large numbers, i.e. the tax actually paid and that theoretically due (Rubin 2011: 111). The potential base is calculated from published data on the macro economy or national accounts data.

The bottom-up approach calculates the tax gap by aggregating the estimates of the tax gap based on various components of tax administrative data. This approach entails using several techniques such as data matching, tax information, risk registers and random enquiries (Rubin 2011: 109). The bottom-up approach involves the use of administrative data to calculate the theoretical liability (Canada Revenue Agency 2016: 18). The tax gap can then be estimated by extrapolating a representative sample of taxpayers' non-compliance to the entire population. Though the bottom-up approach does not rely on the value of a single estimate and gives more information on the components of the gap, it does require more resources (Rubin 2011: 111).

HMRC has pioneered estimates of the tax gap and it has calculated the annual tax gap in the UK since 2005/2006. Its gap analysis has been cited as comprehensive in terms of the taxes covered, addressing multiple dimensions (Toro et al. 2013: 8). It uses an array of approaches to measure the tax gap (such as data matching, random enquiries, and top-down approaches) (see HMRC 2019b). Section 2.2. includes a brief discussion on HMRC's approach to the CIT tax gap analysis.

2.2 The tax gap and the corporate income tax (CIT) system

This section briefly reviews the tax gap analysis of HMRC as presented in its most recent publication (HMRC 2019b). HMRC (2019a: 3) defines the tax gap as the difference between what is and what should in theory be paid. Its estimate for 2017/18 was around GB£35 billion, or 5.6 per cent of total tax liabilities. HMRC also generates tax gaps by type of tax, namely for personal income tax, national insurance contributions, capital gains tax, value added tax, corporate income tax, excise duties, and miscellaneous taxes, and applies alternative estimation methods to each of these taxes. HMRC (2019a) estimated the tax gap for CIT in 2017/18 at approximately 8.7 per cent of the theoretical overall CIT total tax liability (see Figure 1 for the CIT gap estimates in the UK by business size, for the period 2005–2017).

In calculating the CIT gap, HMRC estimates the tax gap for SME (small to medium size) businesses and large businesses separately. The calculation of the large business corporate tax gap involves using information from HMRC's tax return database, or its case management system. From this database it accesses information on a company from its tax return and identifies issues that require further consideration. A first tax estimate associated with these issues is recorded on

the system and referred to as the tax at risk, which refers to the potential additional tax liability of a specific business and acts as a guide to tax revenue risks associated with that business (HMRC 2019b: 34). A risk will be included in the measuring of the gap if it is considered as non-compliant. HMRC's tax specialists classify risks into two categories: avoidance and other risks, where the former involves risks associated with the use of avoidance schemes, and 'other' entails uncertainty about the correct tax treatment and mistakes, amongst other factors (HMRC 2019b: 35). The estimated tax gap is equal to the tax at risk minus the actual and expected compliance yield.[1] The calculation of the SME corporate tax gap makes use of HMRC's random enquiry programme (REP). The REP involves the selection of samples of taxpayers at random and their returns being subjected to thorough investigation by HMRC officials.

Figure 1: CIT tax gap estimates in the UK, by market segment
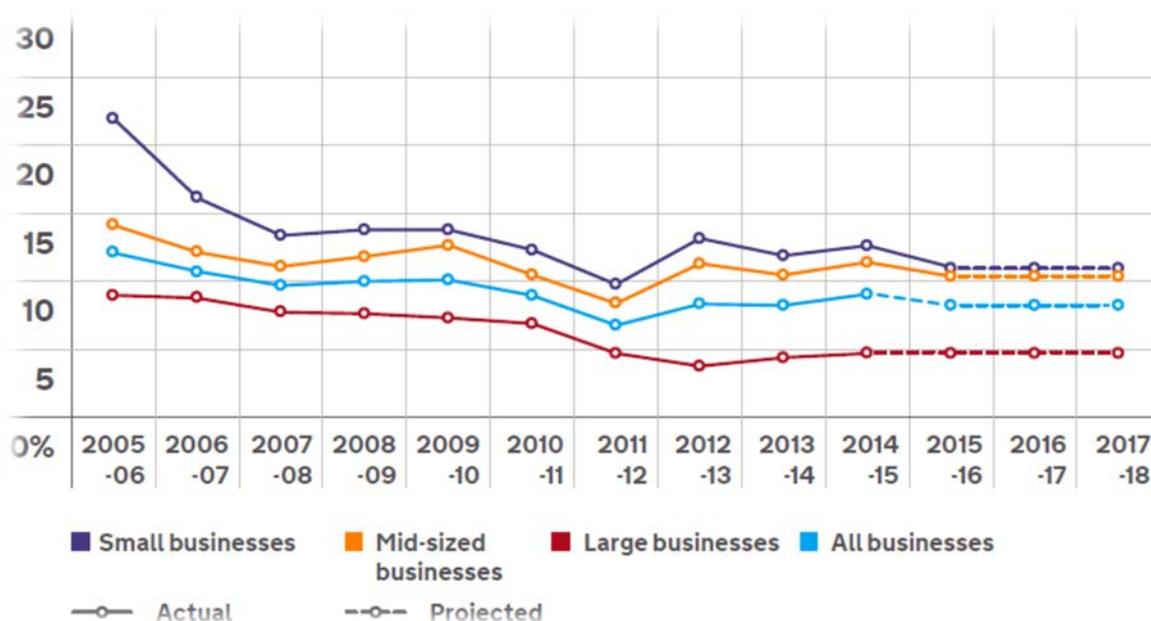
Source: adapted from HMRC (2019a).

2.3   Tax gap analysis in South Africa

Despite the growing interest in tax compliance in recent years, there is limited research in South Africa on tax compliance and the tax gap. This is especially disconcerting given that there have been frequent (anecdotal) references to the low levels of tax compliance in South Africa and the existence of a significant tax gap (see, for example, Temkin 2002). Oberholzer and Stack (2009: 738) referred to an amount of R30 billion that is often quoted in the media. Some studies have been published on taxpayer perceptions and attitudes in South Africa (see for example Ali et al. 2014; Junpath et al. 2016; Oberholzer and Stack 2014), and a study by Gcabo and Robinson (2007) investigated taxpayer behaviour. More recently, Dare et al. (2019) provided estimates on the tax gap for personal income taxes (using survey data in their analysis). However, to the authors' knowledge, there are as yet no published studies on the CIT gap in South Africa. In this respect, a tax gap analysis is especially relevant given the aforementioned references to a significant gap in South Africa. Just recently, the Davis Tax Committee issued a media release that estimated the annual tax gap to be at least R50 billion. The chair, Judge Dennis Davis, stated that this estimate was conservative given that further quantification of tax evasion was necessary (see Ensor 2019).

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[1] HMRC (2019b: 43) defines the compliance yield as the additional tax collected after an enquiry by tax authorities.

Hence, applying a structured tax gap framework with a well-defined methodology would contribute to the quantification of the CIT gap in South Africa.

3   The International Monetary Fund methodology: the top-down approach

This paper follows the IMF methodology (published by Ueda 2018) to estimate the compliance tax gap for the corporate sector in South Africa. Below is a detailed exposition on the methodology and two examples of its application: to Costa Rica and to Slovakia.

3.1   The IMF methodology

Ueda constructs a theoretical relationship between Gross Domestic Product (GDP) and the corporate income tax base to estimate the potential CIT base and potential tax liability. The concept of the corporate income tax compliance gap is then based on two indicators, as adopted in the RA-GAP[2] Framework (Ueda 2018: 10). This includes the CIT taxable base gap and the CIT tax liability gap. The former is the difference between the potential and the declared corporate income tax base, whereas the latter is the difference between the potential corporate tax liability and the actual corporate tax liability (see Figure 2). An important assumption is that the macroeconomic data are generated from a source independent of the tax administrative data in terms of the declarations of the tax base and liabilities.

Figure 2: The top-down tax-corporate income tax gap framework
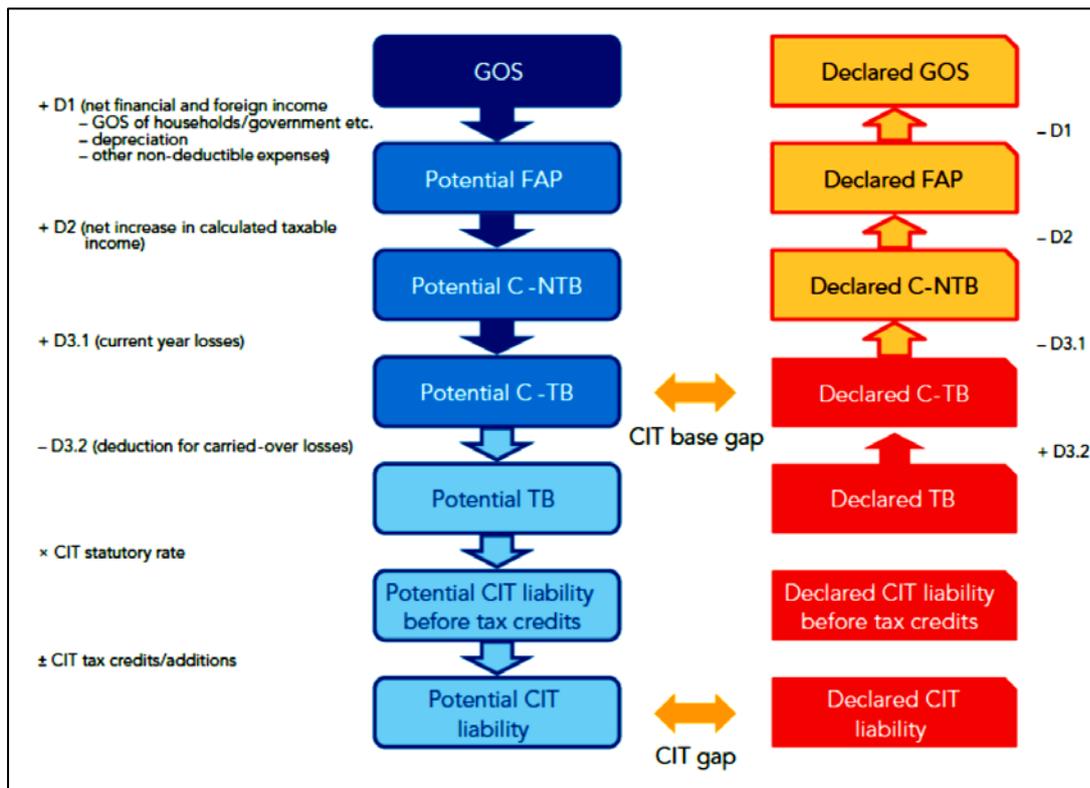
Source: Ueda 2018: 10.

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[2] Revenue Administration – Gap Analysis Program.

The potential gross operating surplus (GOS) is calculated from national accounts data, which are then compared with the GOS declared by corporates in the tax return administrative data. The first step in the framework is to adjust the GOS to obtain the financial accounting profits of corporates. Ueda (2018: 14) explains these adjustments. GOS is the difference between output and the sum of intermediate consumption and primary incomes, i.e. compensation of employees, taxes on production, and imports minus subsidies. Financial accounting profit (FAP) subtracts expenses from income, according to accounting standards. Hence, there are certain items that must be added on the revenue side, and certain items that must be deducted on the expenses side to calculate the financial accounting profits of companies (FAP). Table 1 shows the income and expense items by which the GOS should be adjusted (see Ueda 2018: 16–17).

Table 1: Adjustments to GOS to calculate Financial Accounting Profit (FAP)

Additions to GOS	Deductions from GOS
Interest received	Interest paid
Distributed income of corporations	Payment of other investment income
Other investment income	Rent paid
Rent received	Payment of current transfers
Current transfers received	Depreciation
Capital transfers received	Capital losses
Inventory valuation adjustment	Other adjustments such as current expenditure for research and development and software, provisions of allowances and reserves, stock options to employees.
Capital gains	
Profits of foreign branches	
Other adjustments (cost of trading and issuing securities; reversal of allowances/reserves)	

Source: Ueda (2018: 16).

To derive the current-year potential net taxable income base from the FAP, it is necessary to align the FAP with the taxable income under the current year's CIT legislation. Ueda (2018: 18) suggests the following positive and negative adjustments, for which the data are sourced from the tax administrative records: see Table 2.

Table 2: Adjustments to FAP to derive current net tax base

Additions to FAP	Deductions from FAP
Limitation on deductible donation amounts	Bad debt expenses
Limitation on deductible interest	Negative differences between accounting depreciation and tax deprecation
Limitation on deduction of entertainment expenses	
Limitation on deduction of fines and penalties	Deductions for equity returns
Limitation on deductions of allowances and reserves	Specific deductions for calculating taxable income (such as for R&D expenses)
Positive differences between accounting depreciation and tax depreciation	Foreign source incomes not subject to domestic taxation
	Deductible income subject to other taxes (such as withholding tax or special levies)
	Receipt of dividends

Source: Ueda (2018: 18).

The final steps in the determination of the potential taxable income base are to add total current-year losses to the potential current-year net tax base to derive the potential current-year taxable income base, and then to deduct carried-over losses, which will reflect the potential taxable income base. Ueda (2018: 20) points out that if there are no records of the aggregated losses in the national accounts firm survey data, then tax return data should be used. However, he emphasizes that these

data may have anomalies, as underreporting or misrepresentation of these loss amounts is possible, and audits of such losses are not common practice in tax administration agencies.

After calculating the potential taxable income base, the actual statutory tax rates can be applied, to derive the potential tax liabilities. Any additional tax liabilities or tax credits must then also be considered before the net potential tax base and tax liability can be compared with the declared tax base and liability. See Figure 3 for an illustration of the theoretical relationship between GDP and the CIT base.

Figure 3: Theoretical relationship between GDP and CIT base
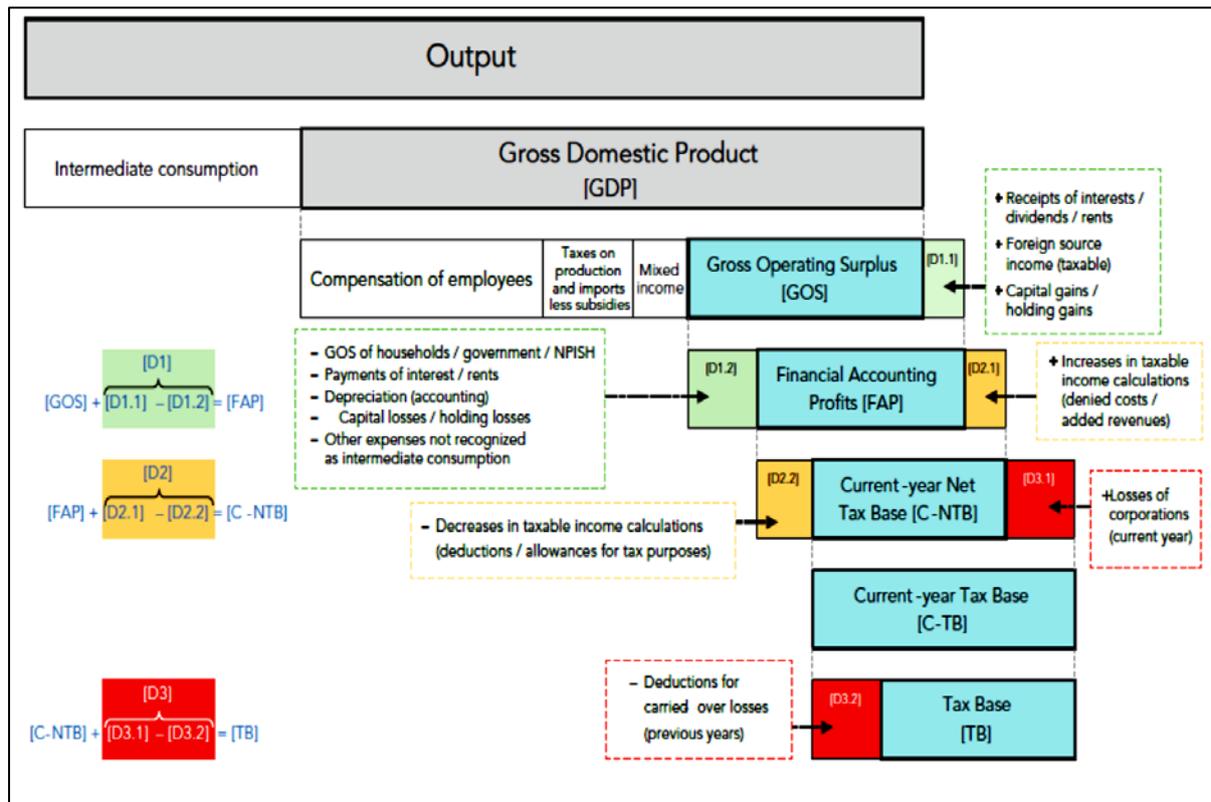
Source: Ueda (2018: 9).

Ueda (2018: 11) states that the corporate compliance tax gap could be expressed in terms of the potential corporate taxable income base, but also as a ratio of GDP in order to show the non-compliance impact in relative terms. A sectoral overview is also possible. Such extended analyses may provide more insight into the overall and sectoral distributions of the CIT gap, as well as providing information on the impact of corporate income tax policies and the impact of non-compliance on inclusive growth in the economy.

The revenue performance of corporate income tax is measured by calculating the revenue efficiency ratio (Ueda 2018: 28). This efficiency ratio is calculated as the ratio of actual (CIT) collections in relation to the reference base (GOS) multiplied by the standard corporate tax rate. Several factors can influence the CIT efficiency ratio (such as the business cycle or deductions such as carried-over losses), thus explaining the trend and deviations of this ratio (Ueda 2018: 28).

This methodology does not consider behavioural changes, since the approach uses estimates of current economic activity as reflected in the statistical data. It also does not provide estimates on tax avoidance and profit shifting.

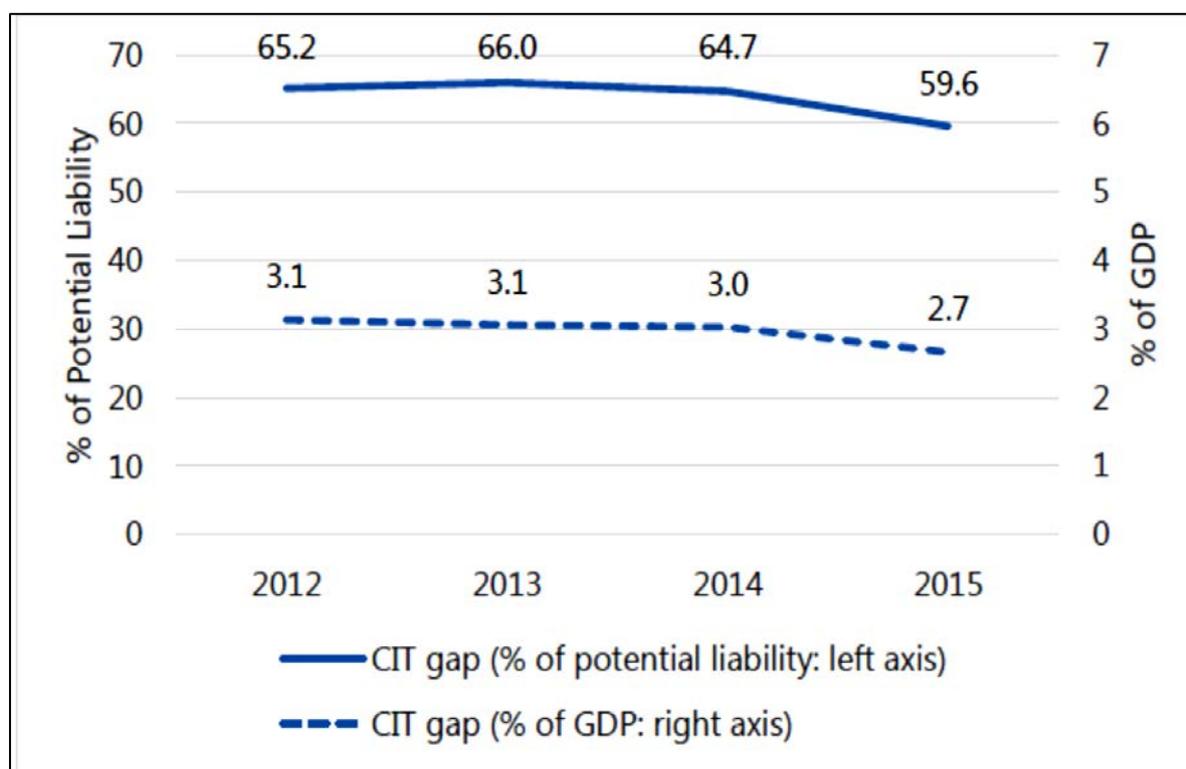### 3.2 Application of the IMF methodology—the case of Costa Rica

Ueda and Pecho (2018) applied the RA-GAP CIT methodology to Costa Rica and estimated the CIT for non-financial firms for the period 2012–2015. The main reason for focusing on the non-financial sector is ascribed to the difficulties in dealing with other sectors. According to Ueda and Pecho (2018: 42),

> 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 more careful treatments are needed to apply the top-down approach to provide appropriate estimates.

They also excluded government sectors and non-profit institutions from their analyses, as well as firms operating in free trade zones. Due to data constraints, the analysis was only conducted for a four-year period, from 2012 to 2015.

Their findings revealed that the estimated taxable income base gap decreased from approximately 65 per cent of the potential taxable income base in 2012 to 59 per cent in 2015—see Figure 4. They postulated that the decline in 2015 could be due to the introduction of a withholding tax mechanism but indicated that further analyses would have to be done to confirm this. The CIT gap relative to potential liability was estimated to be similar to that of the CIT taxable income base gap, and the primary explanation offered was that Costa Rica has very stringent restrictions on losses carried forward. This is quite different from the South African case, although the most recent 2020 Budget has proposed a restriction on the annual losses to be deducted (National Treasury 2020: 42).

Figure 4: The CIT gap for non-financial corporations for Costa Rica, 2012–2015

Source: Ueda and Pecho (2018: 44).

3.3 Application of IMF methodology—the case of Slovakia

The FISCALIS Tax Gap Project Group (2018) reported on the application of the IMF RA-GAP methodology in Slovakia in 2016. The authors advised that one should be careful in employing the top-down approach, as a portion of the data emanates from survey data and these might be subject to errors and non-responses. (In South Africa, national accounts data are based on surveys, and similar problems may exist.) They emphasized the importance of considering the estimated results as work in progress and also revealed that Slovakia intends to enhance the findings of their study with estimates from a bottom-up approach. The final tax gap calculations estimated the gap for non-financial corporations and the CIT taxable income base gap. The tax liability gap as a percentage of potential liability ranged from approximately 41 per cent in 2012 to 8 per cent in 2016. The reduction was ascribed to a reduction in underreported taxable income, as well as a decrease in declared losses (FISCALIS Tax Gap Project Group 2018: 74–75). The CIT gap was estimated to range between 1.3 per cent of GDP in 2012 to 0.2 per cent of GDP in 2016. The report pointed out, however, that the decrease in the gap could be ascribed to an underestimation of the potential CIT base due to data limitations. This postulation supports the earlier statement that the estimated results for South Africa should be regarded as a first estimate, which should be supported by further refinements of the gap using the current methodology, and the application of a bottom-up methodology framework.

4 Data requirements for the top-down tax gap approach

Ueda (2018: 25) specifies the following data requirements to calculate the tax gap:

- National accounts data
- Registration information of individual CIT taxpayers
- Individual tax returns and tax administrative data for all CIT taxpayers and all tax periods included in the study.

This study uses national accounts data published by the South African Reserve Bank (SARB) and corporate income tax administrative data for 2015–2017, available from the South African Revenue Service (SARS), to estimate the CIT gap.

4.1 National accounts data

SARB (2017: 1–2) provides an institutional framework on the sectoral classification used by organizations that collect data for the purposes of producing macroeconomic statistics, as published by SARB. The following categories of institutional sector are identified:

- Non-financial corporate sector
- Financial corporate sector
- General government sector (social security funds included)
- Household sector (inclusive of non-profit institutions that serve households).

Corporations and quasi-corporations are included in the corporate sector. Quasi-corporations are unincorporated businesses that operate as separate units from those to which they belong. Both the first two categories also include public sector entities that are owned or controlled by the general government sector (SARB 2017: 2). The financial corporate sector comprises the monetary authority (SARB, Corporation for Public Deposits), banks, insurers, pension funds, other financial

intermediaries, and financial auxiliaries. The non-financial corporate sector includes both the public and private non-financial sectors (SARB 2017: 4–5).

Following previous empirical studies on the tax gap for other countries, this paper is a first attempt to determine the tax gap for the non-financial corporate sector in South Africa. The sub-sectoral coverage is listed in Table 3. Note that the SARS and SARB sectoral classifications differ, and we adjusted the SARS sectoral classification to align the tax administrative data with the national accounts statistics by excluding financial and insurance activities from the analysis.

The methodological approach follows Ueda (2018: 12) and the empirical studies conducted for Costa Rica and Slovakia, by focusing on the non-financial sector.

Table 3: Reclassification of the non-financial sector: sub-sectors included

Accommodation and food service activities	Information and communication
Activities of extraterritorial organizations	Manufacturing
Activities of households as employers	Mining and quarrying
Administrative and support service activities	Other service activities
Agriculture, forestry, and fishing	Public administration and defence; compulsory social security
Arts, entertainment, and recreation	
Construction	Real estate activities
Education	Transportation and storage
Electricity, gas, steam, and air-conditioning	Unspecified
Human health and social work activities	Water supply, sewerage, and waste management
Professional, scientific, and technical activities	Wholesale and retail trade; repair of motor vehicles and motorcycles

Source: SARS CIT administrative dataset.

The national accounts data were extracted from the South African Reserve Bank (SARB 2019), and the items are shown in Table 4. The data items were downloaded for the non-financial sector.

Table 4: National accounts statistics

Code	Description
KBP6746J	Generation of income account: Gross operating surplus: Non-financial corporations
KBP6748J	Allocation of primary income account: Interest received: Non-financial corporations
KBP6751J	Allocation of primary income account: Rent received: Non-financial corporations
KBP6753J	Allocation of primary income account: Interest paid: Non-financial corporations
KBP6755J	Allocation of primary income account: Rent paid: Non-financial corporations
KBP6757J	Secondary distribution of income account: Non-life insurance claims received: Non-financial corporations
KBP6759J	Secondary distribution of income account: Social contributions paid: Non-financial corporations
KBP6761J	Secondary distribution of income account: Net non-life insurance premiums paid: Non-financial corporations
KBP6762J	Secondary distribution of income account: Miscellaneous current transfers paid: Non-financial corporations
KBP6768J	Capital account: Capital transfers received: Non- financial corporations
KBP6769J	Capital account: Capital transfers paid: Non-financial corporations
KBP6772J	Capital account: Change in inventories: Non-financial corporations

Source: SARB (2019).

4.2 Tax administrative data

Ueda (2018: 25–26) specifies that all items related to the financial accounting profit and taxable income of corporates must be obtained. In addition to this, internal consistency of the data must be verified, and aggregated losses and carried-over losses must be checked for intertemporal consistency. Ueda (2018: 26) recommends that the following information should be obtained from the tax return administrative data:

- Anonymised Taxpayer Identification Number
- Tax period
- CIT liability for the period
- All line items of CIT tax credits and additional CIT liabilities
- CIT liability for the period before considering tax credits and additional liabilities
- Applied CIT rate
- CIT base for the period (declared TB)
- Deduction for carried-over losses
- CIT base for the current year (declared C-TB)
- Declared loss for the current year, if any
- All line items to calculate taxable income from financial accounting profits
- All line items to calculate financial accounting profit/loss, including income/revenue and cost/expense items, or separate financial statement data showing the items, as well as accounting depreciation.

Income statement of the ITR14 tax returns

The income statement of the ITR14 tax return provides information on sales, cost of sales, and income items such as accounting profit on disposal of fixed assets and/or other assets, interest received, bad debts recovered, levy income, and other income. The expense items in the income statement include items such as accounting losses on disposal of fixed assets and/or other assets; bad debts written off; utility charges (e.g. electricity); repairs, maintenance, insurance, improvements or alterations; travelling and other expenses.

Tax computation data

The ITR14 tax returns include the tax computation detail based on the current tax legislation rules to adjust the accounting profits or losses of corporates to derive the taxable income or loss for the corporate financial year. The net of credit and debit adjustments is added to the national accounts survey data estimates of net financial accounting profits. This estimated total is then adjusted for current year's losses and carried-over losses of prior years (see below: CIT administration data), to generate the potential tax base (see Table 6).

CIT administrative data

The CIT return data do not include information on the determined taxable income, assessed losses brought forward (i.e. carried-over losses of prior years), final assessment results, or the actual tax payable for the year of assessment. To account for these variables the ITR14 data are refined with assessed variables in order to provide the information required to calculate the tax gap more accurately on the basis of the actual assessed data.

4.3 Limitations to national accounts survey data

The estimates of the potential CIT base and potential tax liability depend on the accuracy of the national accounts survey data. If there are non-filers of tax returns or there are under- or over-declarations of sales or cost of sales, and these institutional units' financial data are captured in the national accounts survey data, differences between the tax administrative return data and the national accounts data will reflect in the tax gap analysis. This is also the case if there are errors in the national accounts data due to errors in the underlying surveys used to generate the data (Ueda 2018: 7). Unavailability of data is another limitation that could cause the tax gap to be under- or over-estimated.

4.4 Limitations to the tax administrative data

The accuracy of the tax administrative data is affected by the possibility of tax return information being under review/audit at the time of conducting this paper. This might be due to the submission of an objection and/or appeal for a reduction of the assessment by a company, which may lead to revisions to ITR14 return information and the re-calculation of the assessment. As a result, the information reported here may alter in subsequent iterations of this study.

5 Tax gap analysis for South Africa

This section discusses the results of the CIT tax gap analysis for South Africa, using the IMF methodology described in Section 3. The SARS tax data extraction, cleaning, and management are discussed in Sithole et al. (2020), which is available from UNU-WIDER.

The methodology applied to determine the tax gap for 2015 to 2017 is documented below and summarized in Tables 5 and 6. Table 5 shows the derivation of receipts and payments used in the calculation of the potential financial accounting profit (shown in Table 6). The subsequent steps to derive the potential tax base are shown in Table 6.

Table 5: Tax gap analysis[3]—potential tax liability

Non-financial sector	2015	2016	2017
Gross operating surplus (SARB)	**876,019**	**931,683**	**1,008,084**
Plus (+)			
Interest receipts (SARB)	114,819	119,065	95,333
Rent (SARB)	697	662	642
Non-life insurance claims (SARB)	31,649	35,399	39,281
Capital transfers (SARB)	16,411	13,691	19,886
Inventory valuation adjustment (SARB)	25,546	-8,815	2,050
Sub-total: Receipts	**189,122**	**160,002**	**157,192**
Minus (-)			
Interest paid (SARB)	115,307	111,423	95,807
Rent paid (SARB)	2,945	5,060	5,595
Social contributions paid (SARB)	16,728	17,263	18,320
Net non-life insurance premiums (SARB)	31,649	35,399	39,281
Miscellaneous (SARB)	5,357	5,216	5,348
Capital transfers (SARB)	-60	-59	-59
Accounting depreciation (SARS)	188,921	162,473	158,543
Sub-total: Payments	**360,847**	**336,775**	**322,835**

Source: authors' calculations from data sources: SARB (2019), SARS CIT administrative dataset (2015–2017).

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[3] All monetary amounts in this paper are in Rand million, current year prices (unless otherwise specified).

The potential tax liability is calculated by starting from the gross operating surplus. The additional income receipt items, which are not perceived as output items in the national accounts, are added. These items include interest receipts, rent, inventory evaluation adjustment, non-life insurance claims, and social contributions. The next step is to deduct expenses that are not recognized as input items in the national accounts, but which are deducted in the financial income statements of corporations. These include items such as interest paid, rent paid, current transfers, social contributions, non-life insurance claims, miscellaneous expenses, and accounting depreciation.

After calculating the potential accounting profit, the potential current-year tax base is derived by considering the tax computation adjustments. The net (computation) adjustments to accounting profits and losses of firms are based on the tax legislative rules, and the data are extracted from the ITR14 tax returns. The difference between the debit and credit adjustments is then added to the potential FAP, as shown in Table 6.

Table 6: Tax gap analysis—declared tax base and tax liability

	2015	2016	2017
Potential Financial Accounting Profit (FAP): Non-financial firms (NFS)	704,294	754,910	842,441
Plus (+)			
Net adjustments NFS (SARS)	-274,324	-301,777	-205,634
Plus (+)			
Absolute NFS current-year losses	376,943	156,347	146,452
Potential Current Year Tax Base (C-TB)	**806,913**	**609,480**	**783,259**
Minus (-)			
Absolute NFS deductions for carried-over losses	47,362	54,115	58,371
Potential Tax Base (TB)	**759,551**	**555,365**	**724,888**
SARS assessed data			
Declared tax base NFS (Net profit firms)	408,178	398,745	404,809
Plus (+)			
Absolute NFS deductions for carried-over losses	47,362	54,115	58,371
Declared Current Year Tax Base (C-TB)	**455,540**	**452,860**	**463,180**
Declared CIT liability (NFS)	**111,946**	**110,995**	**115,152**

Source: authors' calculations from SARS CIT administrative dataset data (2015–2017).

A further step towards calculating the potential tax base is the derivation of the potential current-year tax base, by adding the current-year losses (after net adjustments, i.e. the calculated loss). Since potential liabilities must reflect only the activities of profit-making corporations, it is necessary to add back the absolute value of the aggregate losses for the current year. Finally, the last step in deriving the potential tax base and the potential liability is to deduct the carried-over losses as specified in the CIT legislation. The available ITR14 assessed corporate income tax data contain the assessment taxable income and assessment tax payable by calendar year. Assessed taxable income is the sum of cumulative assessed losses brought forward from prior years and the current year's taxable profits or losses after net adjustments. In the calculation of the tax gap it is a requirement to deduct the portion of the cumulative losses utilized in the current year from the potential current-year tax base, to derive the potential tax base. Utilization of the losses in the current year are limited to the portion of the cumulative losses set against taxable profits after debit and credit adjustments have been applied to the accounting profits of corporate income taxpayers.

The methodology developed to calculate the key variables used in the gap analysis involved the construction of six scenarios at the individual corporate income taxpayer level, using the SARS tax administrative data. The scenarios give information on the company's profit/loss position and

whether it is making a calculated profit or loss (after net adjustments). From these scenarios the applicable net adjustments, aggregate current-year losses, cumulative losses utilized in the current year, taxable income, and taxes paid are calculated. If a company is in a calculated profit position, some of the carried-over losses from previous years can be deducted and if it has taxable income remaining after this deduction, there will be tax payable. Below is a description of the six scenarios from which these variables were derived.

1. A company can move from an accounting profit to a calculated taxable profit, after net adjustments (credit minus debit adjustments) within the computation tax rules, and if there is a positive taxable income after deducting carried-over losses, tax will be paid. Hence, in the first scenario the difference between the calculated taxable profits and the calculated taxable income at the applicable average tax rate is the utilized cumulative losses for the specific year. Note that there are no calculated current-year losses in this scenario.

2. A company can move from an accounting profit to a calculated loss after net adjustments. This implies that there is no (positive) taxable income from which to deduct any cumulative (carried-over) losses, and hence taxable income and tax payable are both zero. No cumulative losses are calculated in this scenario; the current-year losses that are calculated are added to the cumulative losses brought forward from previous years with zero utilization in the specific year of previous year's tax losses.

3. A company can move from an accounting loss to a calculated taxable profit (after net adjustments), and the difference between the calculated taxable profit and the calculated taxable income at the applicable average tax rate is the utilized cumulative losses for the specific year. This scenario generates positive calculated taxable income, and tax payable.

4. A company can move from an accounting loss to a calculated loss (after net adjustments). In this fourth scenario the current year's taxable losses are calculated after adjusting the accounting loss of the company in accordance with the computation tax rules (i.e. the relevant debit and credit adjustments). The specific year's taxable losses are added to the cumulative losses brought forward from previous years with zero utilization in the current year of previous year's tax losses. Hence, in this scenario there is no (positive) taxable income and hence no taxes are payable.

5. In the fifth scenario a company can move from zero accounting profit to a calculated taxable profit after net adjustments. The difference between the calculated taxable profits and calculated taxable income at the applicable average tax rate is the utilized cumulative losses for the specific year. In this scenario, the company makes a (positive) taxable income and taxes are payable.

6. Finally, in the sixth scenario a company can move from zero accounting profit to a calculated loss (after net adjustments). The current year's taxable losses are added to the cumulative losses brought forward from previous years with zero utilization in the specific year of previous year's tax losses. There are no (positive) taxable income and no taxes payable.

The current year's aggregated losses (shown in Table 6) are the sum of the calculated losses in scenarios 2, 4, and 6. The calculated taxable income and the tax payable were derived from scenarios 1, 3, and 5. The portion of the cumulative (carried-over) losses deducted from the potential current-year tax base (shown in Table 6) was derived from scenarios 1, 3, and 5. These cumulative losses were deducted from the potential current-year tax base to derive the potential tax base. The potential tax liability was then derived at an average (unweighted) rate of 28 per cent of the tax base. The CIT base tax gap and the CIT tax gap calculations required the derivation of the declared current-year tax base and declared tax liability.

Following Ueda and Pecho (2018: 10), we derived the (calculated) declared current-year tax base by adding the (calculated) losses brought forward to the declared taxable base to give the calculated

current-year tax base (shown in Table 6). The calculated taxable base was derived from the taxable income in each of the six scenarios and it was aggregated to give the calculated taxable base for the three years. The difference between the potential and the current-year tax base gives the CIT base gap, as shown in Table 7.

Table 7: Tax gap analysis—CIT base gap and CIT gap

	2015	2016	2017
Potential NFS CIT liability	**205,079**	**155,502**	**202,969**
NFS CIT base gap	351,373	156,620	320,079
NFS CIT base gap / Potential C-TB	43.5%	25.7%	40.9%
NFS CIT gap	93,133	44,507	87,817
NFS CIT gap / Potential TB	**12.3%**	**8.0%**	**12.1%**

Source: authors' calculations from SARS CIT administrative dataset (2015–2017).

The NFS CIT base gap as a percentage of the calculated potential current-year tax base is close to 40 per cent in 2015 and 2017. In 2016 this ratio is only 25 per cent, thanks to a combination of higher debit adjustments and lower utilization of current-year losses due to the lower available value of taxable income. This is less than the CIT base gap of Costa Rica (see Ueda 2018: 11). The CIT gap, i.e. the difference between the calculated potential tax liability and the calculated declared tax liability, varies from 8 per cent for 2016 to just above 12 per cent for 2015 and 2017. Note that this is the estimated calculated tax liability, which differs from the actual CIT cash collections. The estimated average CIT gap is approximately 2 per cent of GDP: see Figure 5.

Figure 5: CIT gap as percentage of GDP
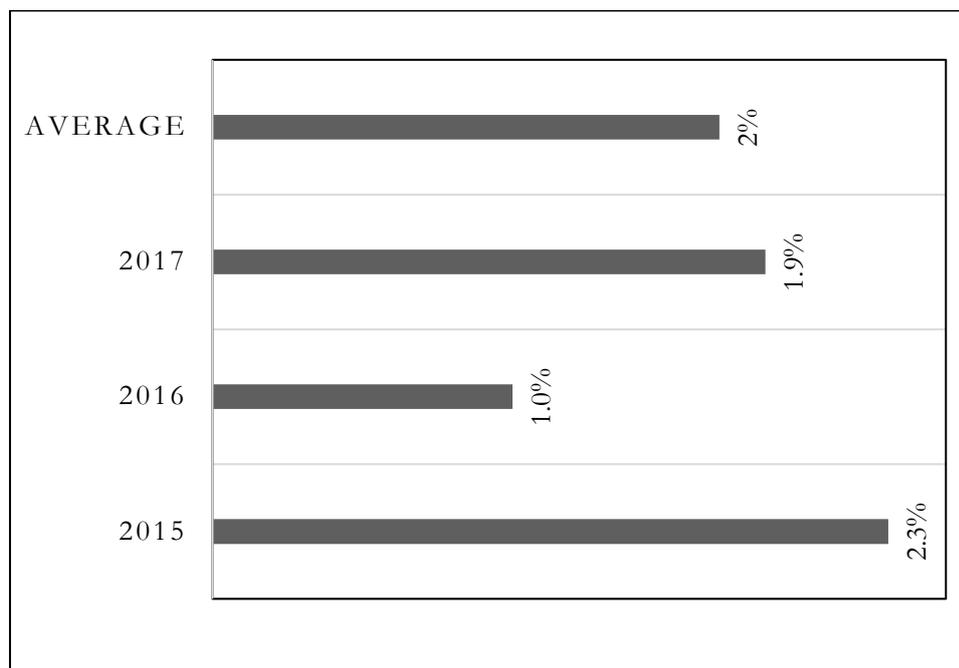
Source: authors' calculations from SARS CIT administrative dataset (2015–2017); SARB (2019).

A final calculation is that of the CIT efficiency ratios, discussed in Section 3.1. The calculation entails dividing the tax liability by the reference tax base times the tax rate. In Table 8 the ratios are calculated for the potential and calculated tax liabilities (estimated in Tables 6 and 7), using GOS as the base. Using the potential tax liability gives an efficiency ratio of 72 per cent (on average for 2015 to 2017), whilst with the calculated declared tax liability, the efficiency ratio is smaller by

23 per cent points. It is therefore evident that efficiency gains are possible with increased compliance.

Table 8: CIT efficiency ratios

	2015	2016	2017	
Gross operating surplus	876,019	931,683	1,008,084	
Potential tax liability	205,079	155,502	202,969	
Calculated tax liability	111,946	110,995	115,152	
Tax rate	0.28	0.28	0.28	
		CIT efficiency ratios		
				Average (2015–2017)
Potential CIT efficiency ratio	**84%**	**60%**	**72%**	**72%**
Declared CIT efficiency ratio	**46%**	**43%**	**41%**	**43%**

Source: authors' calculations from SARB (2019); SARS CIT administrative dataset (2015–2017).

6   Conclusion

This paper calculated an estimate of the difference between potential and declared tax liabilities for the non-financial corporate sector (or the CIT tax gap) for the calendar years 2015 to 2017, using a top-down approach. This entails the use of national accounts survey statistics and tax administrative data.

In the calculation of the estimated CIT base gap and the CIT liability gap, the ITR14 tax return data were linked to the CIT assessed data to provide the data framework required for the top-down approach, as described in the IMF paper by Ueda (2018). The product account for the non-financial sector as published by SARB provided the foundation for the calculation of the potential CIT base, and this estimate was adjusted in line with tax administrative data to determine the potential CIT liability.

There were numerous challenges in calculating the actual CIT tax base and hence the actual CIT liabilities for the non-financial corporate sector, mainly due to the non-linkage of tax assessed data and the ITR14 tax return data. A methodology had to be developed to ensure that the potential tax base and the actual CIT base were estimated in a consistent manner that could be replicated and explained. Given the difficulties encountered in the compilation of the CIT tax administrative data, a decision was made to limit the estimate of the CIT liability gap in this paper to the non-financial sector. Ueda (2018) recommends that tax gap estimates for the financial sector be done separately to account for the unique transactions by this sector.

Furthermore, data for the non-financial sector as defined by SARB were included in the financial sector and this required that some of the SARS sectors currently classified under the financial sector had to be reclassified as part of the non-financial sector for analysis purposes. The estimation of the top-down estimates of the CIT gap for the years 2015–2017 required a detailed analysis, in-depth understanding, and clarity of the CIT data, which resulted in the unique development of a tax gap methodology based on the South African CIT return data.

The results of this first attempt to estimate South Africa's CIT gap show that it varies between 8 per cent and 12 per cent of the potential tax base for the period 2015–2017. These estimates could be further refined to contribute to evidenced policy information supporting strategies for improved revenue mobilization. Furthermore, the gap was only calculated for the non-financial sector in South Africa and it is recommended that the CIT gap be determined for the financial

sector to estimate a total CIT gap. It is also recommended that the CIT gap be monitored on an annual basis with the necessary analysis to determine and guide tax policy and tax administrative operational measures. Policy goals such as revenue mobilization and inclusive growth can only be achieved through effective tax policy measures and efficient tax revenue collection.

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