Ethiopia's tax-to-GDP ratio: benchmark estimation and performance analysis

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Foreword

Over the past six years, Ethiopia has undertaken an ambitious and far-reaching reform agenda to address long-standing structural, democratic, political, and economic challenges. As one of Africa's largest and most dynamic economies, Ethiopia's political transition in the spring of 2018 ushered in a new era of optimism—anchored in the promise of democratic governance, inclusive development, and sustained economic stability.

At the core of this transformative agenda lies the imperative of **domestic revenue mobilization**. In a global environment where access to external financing is increasingly constrained—and as reform efforts require substantial resources—strengthening our domestic capacity to fund national priorities has become an urgent necessity.

Nonetheless, the challenge remains considerable. Ethiopia's **tax-to-GDP ratio continues to fall short** of both regional and global benchmarks, having declined by an average of 0.5 percentage points annually over the past decade. This concerning trend underscores the need for strategic, research-based responses that can reverse the decline and unlock the country's untapped tax potential.

In response, the Government of Ethiopia is placing renewed and elevated emphasis on **comprehensive tax reform**, both from policy and administrative perspectives. To ensure success, these reforms must be guided by **rigorous evidence and context-specific analysis**. While conventional studies often estimate tax potential by comparing countries with similar economic structures or examining historical performance, such approaches typically fall short in identifying **underlying causes and practical solutions**.

Unlike these traditional approaches, this study applies a **contemporary and tailored methodology**. It estimates Ethiopia's tax potential in alignment with the country's unique economic structure, investigates the key drivers behind the declining tax-to-GDP ratio, and proposes actionable interventions to address the challenges.

In this regard, I extend my **sincere appreciation** to the **Tax Policy Department** of the Ministry of Finance and the **Institute for Fiscal Studies (IFS) - through their work on the TaxDev initiative -** for their valuable collaboration and the production of this important study. The findings and recommendations presented in this report will serve as critical inputs to Ethiopia's **National Medium-Term Revenue Strategy (NMTRS)** - a foundational framework guiding the future direction of tax policy and administration.

This study represents a **significant milestone** in our collective journey toward building a more **efficient, equitable, and sustainable tax system**—one that reinforces our development goals and Ethiopia's continued path toward inclusive and resilient growth.

H.E. Eyob Tekalign (PhD)

State Minister, Ministry of Finance

Preface

This study is a collaboration between the Tax Policy Directorate at the Ministry of Finance (MoF) of the Federal Democratic Republic of Ethiopia and the Institute for Fiscal Studies (IFS) through the Centre for Tax Analysis in Developing Countries (TaxDev). The IFS research team (Vedanth Nair, David Phillips, Edris Seid and Ben Waltmann) was responsible for the main analysis and the write-up of the report. The Tax Policy Directorate (Mohammed Osman and Mulay Weldu) defined the key research questions and provided comments on the analysis and report, contributing to the final output. Judith Payne copyedited an earlier version of this report. Any remaining errors are the responsibility of the authors.

This report was prepared primarily between June 2023 and June 2024, and therefore covers tax revenue trends only up to the 2022/23 fiscal year—the most recent year for which data was available at the time of writing. During the finalisation of the report, Ethiopia adopted a new official methodology for calculating tax revenues. However, the analysis presented here is based entirely on the previous methodology.

We would like to thank the UK Government Public Finance Centre of Expertise – funded by UK International Development - for financial support, through the grant to TaxDev. TaxDev is a collaboration between IFS and ODI Global and aims to promote more effective tax policymaking in low- and middle-income countries through research, applied analysis, and partnerships with policymakers.

We would also like to thank participants at the kick-off and validation workshops hosted at the Ministry of Finance for their helpful comments and suggestions.

The views expressed in this report are those of the authors and do not necessarily reflect the views of the funders nor of the other individuals or institutions mentioned here, including the IFS, which has no corporate views.

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Contents

Forward **1**

Preface **3**

Contents **4**

List of figures **7**

List of abbreviations **10**

Executive summary **12**

What is Ethiopia's tax-to-GDP ratio? 12

How has Ethiopia's tax-to-GDP ratio evolved over time? 12

Factors explaining differences in the tax-to-GDP ratio between Ethiopia and other SSA countries 13

Factors explaining changes in Ethiopia's tax-to-GDP ratio over time 14

Discussion and recommendations 17

1. Introduction **19**

1.1 Objectives of this study 21

1.2 Methodology and data 22

1.3 Report structure 24

1.4 Notes 24

2. Estimation of a benchmark tax-to-GDP ratio for Ethiopia **26**

2.1 Comparison of Ethiopia's tax-to-GDP ratio with other SSA countries 26

2.2 Commonly used approaches for benchmarking the tax-to-GDP ratio 29

2.3 Strengths and weaknesses of these models 30

2.4 The benchmarking model employed for this report 31

2.5 Findings from the benchmarking model 32

2.6 Interpreting the model predictions 36

2.7 Comparison with results from stochastic frontier analyses 37

3. Tax-by-tax comparison of Ethiopia's tax-to-GDP ratio to other SSA countries **39**

3.1 Comparison of actual and benchmark tax-to-GDP ratios 40

3.2 Comparison of tax policies 41

Direct taxes 41

VAT 47

Excise tax 49

Trade taxes 51

3.3 Discussion: why is the tax-to-GDP ratio lower in Ethiopia than in other countries?. 53

4. Tax-by-tax analysis of Ethiopia's tax-to-GDP ratio performance over time 56

4.1 VAT 58

VAT withholding 61

Domestic federally collected VAT 67

VAT gap analysis 69

Discussion: why did the VAT-to-GDP ratio fall? 77

4.2 Customs duty and surtax 81

Which product categories contributed to the fall in the imports-to-GDP ratio? 84

Does the reduction in the imports-to-GDP ratio come from reduced prices or reduced quantities? 86

The role of foreign exchange 88

Import tax evasion via under-invoicing 91

Discussion: why did the ratio of customs duty and surtax to GDP fall? 96

4.3 Corporate income tax 97

CIT performance analysis 100

Discussion: why did the CIT-to-GDP ratio fall? 103

4.4 Employment income tax 105

Discussion: why did the EIT-to-GDP ratio fall? 109

5. Issues that may have affected the tax-to-GDP ratio across taxes 111

5.1 Conflict 111

Discussion: the effect of conflict on the tax-to-GDP ratio 116

5.2 Role of the denominator: has GDP growth been overstated? 117

Comparing Ethiopia's real GDP growth with that of regional peers 118

Alternative measures of economic activity 119

Discussion: have GDP measurement issues contributed to the falling tax-to-GDP ratio? 128

6. Conclusion and recommendations 129

6.1 Conclusions 129

6.2 Recommendations 130

References 133

Appendix A. Revenue tables 142

Appendix B. Supplementary figures and table 145
Appendix C. Additional notes on the tax-to-GDP ratio prediction model 157
Appendix D. VAT gap analysis additional results and methodology 158
Potential VAT base 158
Actual VAT revenue 161
Policy and model structure 166
Appendix E. Imports and import composition in Ethiopia 171
Data sources for the analysis of imports 171
The effective tax rate on imports 172

List of figures

Figure ES.1. Breakdown of the fall in the tax-to-GDP ratio by tax instrument 13
Figure 1.1. The tax-to-GDP ratio and forecasts in Ethiopia 19
Figure 1.2. The tax-to-GDP ratio in all countries, 2010–22 20
Figure 2.1. Tax-to-GDP ratios for Ethiopia and comparable countries, 2021 27
Figure 2.2. Ethiopia and SSA medians for selected economic variables 28
Figure 2.3. Predicted tax as a % of GDP for Ethiopia (actual and predicted) and SSA median 32
Figure 2.4. Breakdown of the model prediction for Ethiopia 35
Figure 2.5. Tax potential results for Ethiopia and SSA from McNabb et al. (2021) 37
Figure 3.1. Predicted direct tax, VAT, excise and trade taxes as a % of GDP for Ethiopia in 2021 41
Figure 3.2. Effective PIT rate for an individual earning the equivalent of GDP per capita and 10 times GDP per capita 42
Figure 3.3. Length of tax holiday for example activities 44
Figure 3.4. Statutory withholding tax rates in East African countries 46
Figure 3.5. Withholding tax rates specified by tax treaties and number of treaties signed 47
Figure 3.6. Excise tax collections as a % of GDP for main excise categories, 2021/22 50
Figure 3.7. Effective trade tax on imports 52
Figure 4.1. Breakdown of fall in tax-to-GDP by tax instrument between 2015/16 and 2022/23 56
Figure 4.2. VAT revenues by administrative system 59
Figure 4.3. Example transaction involving VAT withholding 61
Figure 4.4. VAT withholding by the category of withholding agent 63
Figure 4.5. Federal government capital expenditure, public sector investment and private sector investment as a % of GDP 64
Figure 4.7. Breakdown of the fall in domestic federally collected VAT by sector, 2018/19 to 2021/22 68
Figure 4.8. VAT and the overall VAT gap 71
Figure 4.9. Contributions of each sector to the compliance, expenditure and non-taxable gaps 73
Figure 4.10. Role of VAT withholding in construction sector compliance 76
Figure 4.11. VAT-to-GDP ratio under counterfactuals 78
Figure 4.12. Goods imports and customs duty & surtax as a % of GDP, 2015/16 = 100 82

Figure 4.13. Breakdown of the fall in imports by import category 85
Figure 4.14. Decomposition of the fall in goods imports into price and quantity changes 87
Figure 4.15. Official and parallel exchange rates 89
Figure 4.16. Import gap in Ethiopia and select trading partners 93
Figure 4.17. Change in import prices relative to 2019Q1, Ethiopia and other African countries 95
Figure 4.18. Breakdown of decline in CIT by firm/sector between 2015/16 and 2021/22 98
Figure 4.19. Decomposing the decline in profitability of the Commercial Bank of Ethiopia 99
Figure 4.20. Actual and predicted changes in the CIT-to-GDP ratio 101
Figure 4.21. Actual and predicted changes in the CIT-to-GDP ratio by sector 102
Figure 4.22. Average tax rate on an individual earning the equivalent of nominal GDP per capita 106
Figure 4.23. Employment by formal and informal sector 107
Figure 4.24. Comparison of earnings, CPI and GDP, March 2015 = 100 108
Figure 5.1. Tax collections by regional governments 114
Figure 5.2. Tax collections by the federal government in regional branch offices 115
Figure 5.3. Comparing GDP growth in Ethiopia and in its regional peers 119
Figure 5.4. Comparing total earnings from the Urban Employment Unemployment Survey with GDP 120
Figure 5.5. Relationship between night lights growth and recorded GDP per capita growth, 2015 to 2022 122
Figure 5.6. Measured night lights in Ethiopia over time 123
Figure 5.7. Night-lights-predicted GDP compared with recorded GDP 125
Figure 5.8. Comparing aggregate consumption from the Ethiopia Socioeconomic Survey with GDP 127
Figure B.1. Predicted direct tax, VAT, excise and trade taxes as a % of GDP for Ethiopia 145
Figure B.2. VAT rate in sub-Saharan Africa 146
Figure B.3. Statutory rates of corporate income tax in sub-Saharan Africa 151
Figure B.4. VAT withholding credits as a % of output VAT 152
Figure B.5. Change in import categories as a % of GDP, 2015/16 to 2022/23 153
Figure B.6. Import price / quantity decomposition for import categories 154
Figure B.7. Import gap by country 155
Figure B.8. Comparing the GDP deflator and the Consumer Price Index 156
Figure D.1. VAT gap results for all sectors 160
Figure D.2. Comparison of VAT revenue by sector between this study and Hutton et al. (2019) .. 165

Figure D.3. Comparison of aggregate actual VAT, compliance gap, expenditure gap and non-taxable gap between this study and Hutton et al. (2019)..... 168

Figure D.4. Comparison of potential VAT under the current policy structure between this study and Hutton et al. (2019)..... 169

Figure E.1. Imports as a % of GDP from different data sources..... 171

List of abbreviations

AGOA	African Growth and Opportunity Act
ASYCUDA	Automated System for Customs Data
ATAF	African Tax Administration Forum
BEC	Broad Economic Categories
CBE	Commercial Bank of Ethiopia
CIF	cost, insurance and freight
CIT	corporate income tax
CO_2	carbon dioxide
CPI	consumer price index
ECMS	Ethiopian Customs Management System
EFFORT	Endowment Fund for the Rehabilitation of Tigray
EIT	employment income tax
EPSE	Ethiopian Petroleum Supply Enterprise
ESIC	Ethiopian Standard Industrial Classification
ESS	Ethiopia Socioeconomic Survey
ETB	Ethiopian birr
FOB	free on board
FDI	foreign direct investment
FY	fiscal year
GBP	UK pounds
GDP	gross domestic product
GTP	Growth and Transformation Plan
HS	Harmonised (commodity description and coding) System
ICT	information and communication technology
ICTD	International Centre for Tax and Development
IFS	Institute for Fiscal Studies
IMF	International Monetary Fund
IT	information technology
KES	Kenyan shillings
LTO	Large Taxpayers' Office
MoF	Ministry of Finance
MoR	Ministry of Revenue
MTO	Medium Taxpayers' Office
NMTRS	National Medium-Term Revenue Strategy

OECD	Organisation for Economic Cooperation and Development
PAYE	pay-as-you-earn
PBIT	personal business income tax
PIT	personal income tax
pp	percentage points
PPP	purchasing power parity
PSI	Policy Studies Institute
Q	quarter
RA-GAP	Revenue Administration Gap Analysis Programme
RWF	Rwandan franc
SAM	Social Accounting Matrix
SFA	stochastic frontier analysis
SNNP	Southern Nations, Nationalities and Peoples
SOE	state-owned enterprise
SSA	sub-Saharan Africa
SSC	social security contributions
SUT	supply and use table
TADAT	Tax Administration Diagnostic Assessment Tool
TaxDev	Centre for Tax Analysis in Developing Countries
UEUS	Urban Employment Unemployment Survey
UGX	Ugandan shilling
UN	United Nations
UNU-WIDER	United Nations University – World Institute for Development Economics Research
US	United States
USD	United States dollars
VAT	value added tax
VIIRS	Visible Infrared Imaging Radiometer Suite

Executive summary

What is Ethiopia's tax-to-GDP ratio?

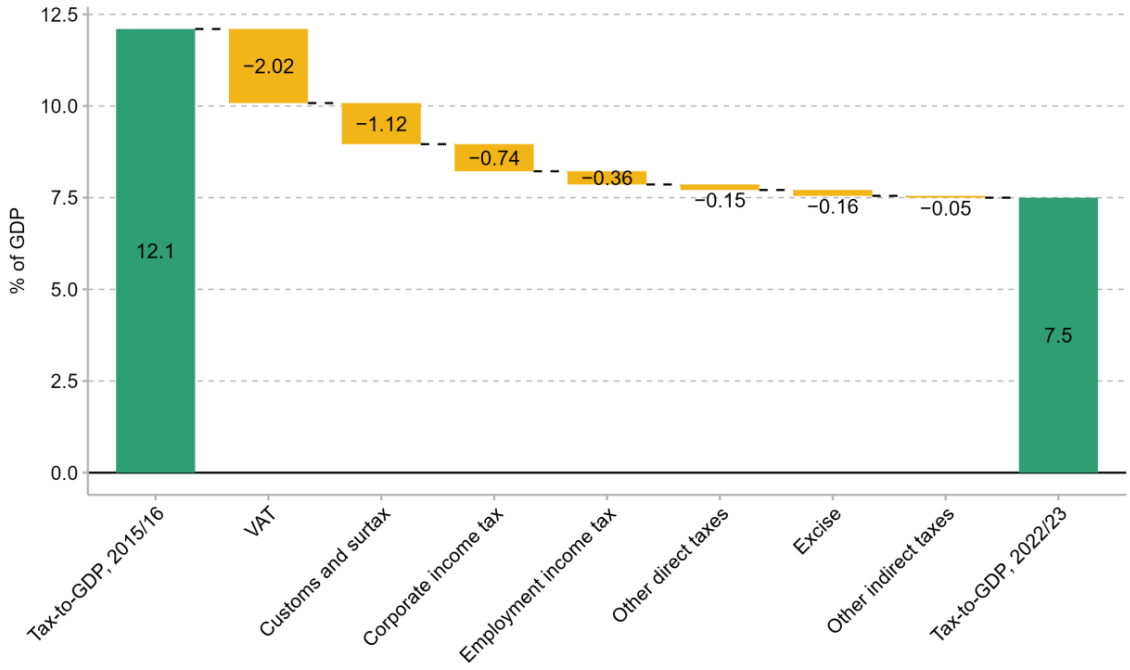
The tax-to-GDP ratio measures a country's total tax collected as a share of its economic output. It is informative about the share of income generated by an economy that flows to the state in the form of tax receipts. For example, if Ethiopia's tax-to-GDP ratio was 10%, that would mean that 10 out of every 100 Birr earned in Ethiopia would end up with the government in the form of tax receipts.

Ethiopia's tax to GDP ratio in 2022/23 was 7.5 percent, meaning that 7.5 Birr out of every 100 Birr earned in Ethiopia were collected by the government in tax. This was less than other sub-Saharan African (SSA) countries. In the same year, Uganda's tax-to-GDP ratio was 13.1%, Kenya's was 15.2% and Rwanda's was 15.7%. The median of all other SSA countries was 13.2% (in 2021). Ethiopia collects substantially less than other SSA countries in direct taxes, VAT and excise duties.

How has Ethiopia's tax-to-GDP ratio evolved over time?

Ethiopia's tax-to-GDP ratio peaked at 12.4% of GDP in 2014/15. Since then, the tax-to-GDP ratio has fallen by 4.9 percentage points. No other country in the world has experienced such a large relative decline in its tax-to-GDP ratio over this period. Due to data availability, this study focuses on the period between 2015/16 and 2022/23. Over this period, the largest contributors to the fall in the tax-to-GDP ratio were VAT, which fell by 2.0 percentage points; followed by customs duty and surtax, which fell by 1.1 percentage points; corporate income tax, which fell by 0.74 percentage points; and employment income tax, which fell by 0.36 percentage points (Figure ES.1).

Figure ES.1. Breakdown of the fall in the tax-to-GDP ratio by tax instrument



Note and source: See Figure 4.1.

Factors explaining differences in the tax-to-GDP ratio between Ethiopia and other SSA countries

Our analysis finds that, of the 5.5 percentage point gap in tax-to-GDP ratios between Ethiopia and other SSA countries:

- **Around 2.2 percentage points can be attributed to structural factors.** These include, but are not limited to, Ethiopia's low GDP per capita, high share of agriculture in GDP, low share of manufacturing in GDP and low urbanisation rate, all of which are correlated with low tax-to-GDP ratios.
- A further 1.7 percentage points of the gap (in 2021/22) is attributable to uncollected excises and VAT on fuel, and the absence of excises on airtime/data and on financial transactions. Ethiopia has since mandated the collection of VAT and excise on fuel, and introduced an excise on airtime, but the revenue impact of this is not yet known.
- At most an additional 0.4 percentage points of the gap is attributable to Ethiopia's relatively low VAT rate. Ethiopia's headline VAT rate is 15%, whereas the median for other SSA countries with a VAT is 17.5%.

Other tax policy choices are unlikely to explain Ethiopia's comparatively low tax-to-GDP ratio. The scope of VAT exemptions is broadly similar to that in other countries. Ethiopia's headline corporate income tax (CIT) rate is exactly the median for other SSA countries. Average

personal income tax rates and trade tax rates are higher in Ethiopia than in other SSA countries. While Ethiopia does stand out in having relatively low minimum capital requirements to qualify for CIT holidays, low statutory withholding rates on royalties, dividends and interest income, and a large number of double tax treaties which further reduce these withholding rates, the overall effect of these choices on the tax-to-GDP ratio is likely small.

Lower compliance is likely to explain some of the remaining 1.2 percentage points between Ethiopia and other SSA countries that cannot be explained by structural factors or by policy. There is some evidence that the quality of tax administration in Ethiopia is lower than in other SSA countries. However, there may be other reasons for this remaining gap. Policy choices not considered in this report, such as ad-hoc exemptions, may be more prevalent in Ethiopia than in other countries. Policy differences whose costs we have not been able to quantify – such as low minimum capital requirements for CIT holidays, low withholding rates and a large number of tax treaties – may actually be quite costly. It is also possible that our prediction of the tax-to-GDP ratio for Ethiopia understates the true effect of Ethiopia's structural factors on the tax-to-GDP ratio.

Factors explaining changes in Ethiopia's tax-to-GDP ratio over time

Ethiopia has experienced a major change in the structure of its economy in the last ten years. It is widely acknowledged that Ethiopia's high rate of economic growth in the mid-2010s was driven by investment. Especially important were state-backed investment in projects such as the Grand Ethiopian Renaissance Dam and the Addis–Djibouti railway, as well as a number of smaller road, energy, irrigation and housing development projects. This investment boom has now largely come to an end (International Monetary Fund, 2020; Federal Democratic Republic of Ethiopia, 2020; World Bank, 2022a; Dutu, Sennoga and Mpuga, 2023). Investment as a share of GDP fell from 37% in 2015/16 to 22% in 2022/23, of which investment by the government and state-owned enterprises fell from 14% to 7% (in 2021/22). Other, related shifts in the Ethiopian economy include the fall in imports of goods as a share of GDP from 24% to 10% between 2015/16 and 2022/23, the fall in manufacturing from 5.7% to 4.5% of GDP and the growth in agriculture from 35% to 36% of GDP.

Our analysis aims to quantify the contribution of these structural factors to the fall in Ethiopia's tax-to-GDP ratio from 2015/16 to 2022/23, as well as the contribution of changes in compliances and changes in policy. We find that of the overall fall of 4.6 percentage points, 2.2 percentage points can be attributed to changes in the structure of the Ethiopian economy since 2015/16, very little can be attributed to policy choices, and around 1.8 percentage points can be attributed to worsening tax compliance (around 0.6 percent of the fall occurred in collection of taxes that were not included in the analysis, or in periods not covered by tax microdata).

Of the 2.2 percentage points of the fall in the tax-to-GDP ratio can be attributed to 'structural factors':

- Around 1.1 percentage points are a result of the fall in imports as a share of GDP between 2015/16 and 2022/23, leading to an almost proportional fall in customs duty and surtax as a share of GDP.
- Around 0.6 percentage points are a result of falling public investment leading to lower VAT withholding by the public sector on its purchases, which was not offset by higher collections in other parts of the VAT system.
- The fall in employment income tax revenue, which was equivalent to around 0.36 percentage points of GDP, appears to be driven to a large extent by the earnings of formal sector employees growing less quickly than GDP since 2018/19. The slowdown in earnings growth is greatest for public sector employees, possibly due to wage freezes.
- 0.15 percentage points is a result of lower CIT revenues as a result of the decreasing profitability of the Commercial Bank of Ethiopia. Given that the CBE was heavily involved in lending to state-owned enterprises, this may also be linked to the fall in public sector investment.

Little of the fall in the tax-to-GDP ratio can be attributed to policy changes:

- Less than 0.1 percentage point of the fall is linked to temporary VAT exemptions for eggs, sugar, pasta, baby formula and vegetable oils introduced in 2020. These were the only new VAT exemptions introduced during this period.
- Apart from these VAT exemptions, there have not been any other policy changes since 2015/16 that are likely to have had a substantial impact on the tax-to-GDP ratio.

Of the 1.8 percentage points of the fall in the tax-to-GDP ratio that is attributable to compliance-related factors:

- 1.4 percentage points are the result of an increased VAT compliance gap, which is not already explained by a shift in the composition of GDP from high- to low-compliance sectors or by the fall in public investment leading to a fall in VAT withholding. A major part of this is an estimated increase in non-compliance in the wholesale/retail sector.
- 0.4 percentage points are the result of CIT underperformance, especially in the wholesale/retail and construction sectors. It may be the case that this underperformance is due to non-compliance, though it may also be due to these sectors becoming less profitable.

Another set of factors that may have influenced Ethiopia's tax-to-GDP ratio are recent shocks to the economy. These included the COVID-19 pandemic; escalating conflict throughout the country, but most acutely in Tigray; and foreign exchange issues. The impact of these shocks on the tax-to-GDP ratio is ambiguous, as they have likely affected both tax collection (the

numerator) and economic output (the denominator). Our analysis does not attempt to quantify the overall effect of these shocks. However, we estimate that the conflict lowered tax collected in Tigray and from companies with a high exposure to Tigray by 0.25 percentage points. We discuss the likely effects of foreign exchange issues alongside our discussion of customs duty and surtax.

A final factor in the fall of the *reported* tax-to-GDP ratio may have been overestimated GDP growth. If true GDP growth since 2014/15 was less than reported, but tax receipts were reported accurately, the true tax-to-GDP ratio will not have fallen as much as the reported tax-to-GDP ratio. However, there is no conclusive evidence that Ethiopia's GDP growth has been overestimated. Reported GDP growth has been very high in Ethiopia and much higher than GDP growth as predicted by two alternative measures of economic activity: urban employment earnings and night-time lights as measured by a satellite. But these alternative measures of GDP growth have serious shortcomings, and a third alternative measure of GDP, aggregate consumption as recorded in the Ethiopia Socioeconomic Survey, is entirely consistent with reported GDP growth. **We have therefore taken official GDP as given for our main analysis.**

Box 1.1. Summary of factors explaining Ethiopia's tax-to-GDP performance

Ethiopia's tax-to-GDP ratio is 5.5 percentage points lower than the median tax-to-GDP ratio for other sub-Saharan African countries. Of this:

- Around 2.2 percentage points can be attributed to differences in the structure of Ethiopia's economy and its demographics when compared with other African countries. One example is Ethiopia's large agricultural sector, which is very difficult to tax as much of it is subsistence or smallholder agriculture.
- Around 2.1 percentage points can be attributed to policy differences between Ethiopia and other countries. This includes Ethiopia not collecting excises and VAT on fuel (until recently), the absence of excises on airtime (until recently) and on financial transactions, and Ethiopia's relatively low VAT rate.
- The remaining 1.2 percentage points can be attributed to weaker compliance in Ethiopia than in other countries.

Ethiopia's tax-to-GDP ratio has fallen by 4.6 percentage points between 2015/16 and 2022/23. Of this:

- Around 2.2 percentage points can be attributed to changes in the structure of the Ethiopian economy since 2015/16, the most important being the fall in public sector investment and the related fall in imports as a share of GDP.
- Very little can be attributed to policy changes, as there have been very few revenue-losing reforms since 2015/16.

- Around 1.8 percentage points can be attributed to a reduction in compliance that cannot be explained by changes in the structure of Ethiopia's economy.

Discussion and recommendations

Our analysis shows that nearly half of the difference between Ethiopia's GDP ratio and the median tax-to-GDP ratio in other SSA countries, as well as the difference between Ethiopia's tax-to-GDP ratio in 2022/23 and its own tax-to-GDP ratio in 2015/16, is due to (changes in) the structure of Ethiopia's economy. Policy differences can explain nearly 40% of the difference between Ethiopia and other SSA economies, although this gap is expected to narrow substantially as VAT and excises on fuel start being collected in full in Ethiopia. Tax policy played almost no role in the fall of Ethiopia's tax-to-GDP ratio since 2015/16. The remaining differences in the tax-to-GDP ratio between Ethiopia and other SSA countries, as well as between Ethiopia in 2022/23 and Ethiopia in 2015/16 can be attributed to differences in compliance. The breakdown of the differences into different factors is summarised in Box 1.1.

Ethiopia's high reliance on taxes on imports and taxes on the public sector has made the country vulnerable to the fall in imports and public sector activity. Together, tax revenue from these sources accounts for around 60% of federal tax revenue. To sustainably increase its tax-to-GDP ratio, Ethiopia will have to increase taxes collected from the private sector. This will be challenging as, with a few notable exceptions, policy choices are similar to those in other SSA countries (though it is not necessarily the case that policy choices in other countries are optimal). Compliance is weak and appears to have gone backwards. The National Medium-Term Revenue Strategy (NMTRS) sets out a reform plan for tax policy and tax administration with the ambitious goal of raising the tax-to-GDP ratio by 7 percentage points between 2023/24 and 2027/28. We provide recommendations for policy proposals that are not already identified in the NMTRS, based on the issues identified in this report.

We recommend that the Government of Ethiopia considers a rigorous evaluation of the following policy proposals:

- Designating large private companies as VAT withholding agents, to increase VAT compliance.
- Increasing the VAT rate to the sub-Saharan African median of 17.5%.

There are important risks to both of these policies that need to be carefully weighted. Private sector withholding agents would need to be carefully audited to ensure that they are doing this correctly. An increase in the VAT rate would increase the tax wedge between compliant and non-

compliant businesses and risk depressing formal economic activity. Any evaluation of these policies must weigh these costs against any potential revenue gains.

We also set out recommendations to improve and streamline the process by which tax policy and tax administration are conducted. These are that the Government of Ethiopia considers:

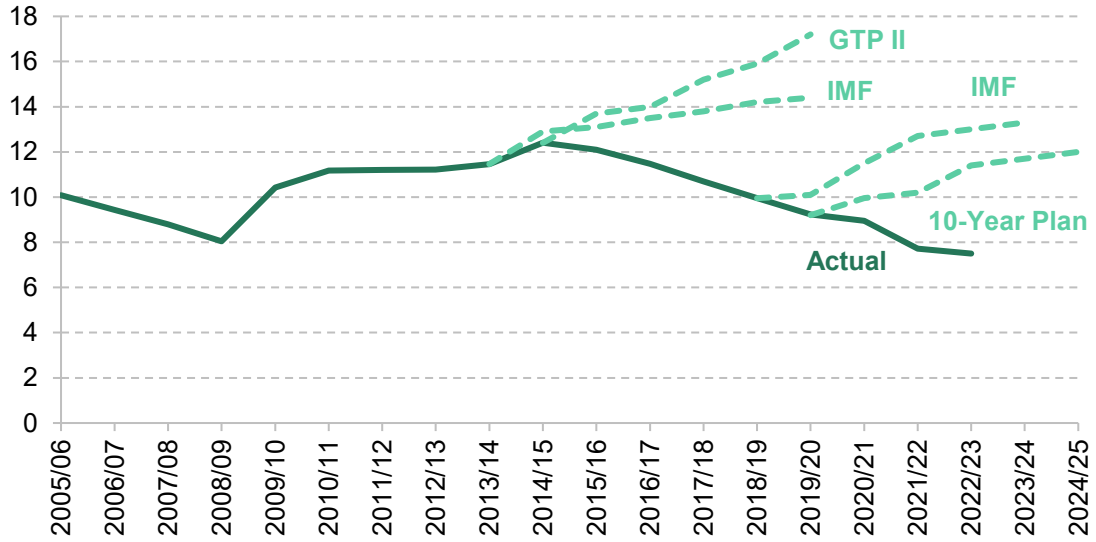
- Closely monitoring that tax policy is being correctly implemented.
- Regularly monitoring the tax-to-GDP ratio going forward.
- Ensuring that the measure of the tax-to-GDP ratio is consistent across government.
- Conducting randomised audits of taxpayers to monitor compliance.
- Maintaining the quality of administrative tax data for VAT, CIT and customs duty (which has improved substantially in the last five years) and improving data sharing processes between the Ministry of Finance and the Ministry of Revenue.

1. Introduction

The share of GDP collected as tax revenues, or the tax-to-GDP ratio, is a crucial indicator for any government. Tax revenues are required to finance vital government services, such as education, health, and infrastructure development. Raising tax revenues also enables governments to reduce their dependency on foreign aid and external debt, promoting fiscal autonomy and long-term economic stability. This is particularly important for Ethiopia, which is already in 'debt distress' and thus unable to take on additional external debt.[1]

The tax-to-GDP ratio normally increases as GDP grows. GDP growth is associated with a smaller informal sector, a more urbanised population, greater use of technology and higher state capacity, all of which make it easier to raise tax revenues (Besley and Persson, 2014). Between 2008/09 and 2014/15, Ethiopia's strong economic growth was indeed accompanied by strong growth in the tax-to-GDP ratio, rising from 8.0% to 12.4% (Figure 1.1). After 2014/15, the high rates of reported economic growth continued, but the tax-to-GDP ratio has fallen dramatically.

Figure 1.1. The tax-to-GDP ratio and forecasts in Ethiopia



Source: Ethiopian Ministry of Finance, National Planning Commission (2016), Planning and Development Commission (2021), International Monetary Fund (2015), International Monetary Fund (2020).

[1] https://www.worldbank.org/en/programs/debt-toolkit/dsa/. Retrieved September 2023.

Figure 1.2. The tax-to-GDP ratio in all countries, 2010–22

Note: Taxes, excluding social security contributions, for all countries for which data are available. Each dot is a specific country/year observation. The highlighted dots are Ethiopia. The black line is the linear best-fit line and can be interpreted as the expected tax-to-GDP ratio for a country with a given level of GDP per capita. The cluster of dots in the bottom right are oil producers.

Source: Ethiopia – Ministry of Revenue official revenue reports. Other countries – UNU-WIDER (2023).

In 2022/23, Ethiopia raised 7.5% of its GDP in tax revenue. Since 2014/15, the tax-to-GDP ratio has consistently underperformed IMF forecasts, as well as Ethiopia's own targets: if it had followed the path aimed for in the 'Growth and Transformation Plan II' (National Planning Commission, 2016), it would be more than double what it is today. The tax-to-GDP ratio in 2021/22 was already 2.5 percentage points lower than the target path in Ethiopia's 10-Year Plan (Planning and Development Commission, 2021). The fall in the tax-to-GDP ratio is highly unusual by international standards: no other country experienced such a large fall in its tax-to-GDP ratio during this period (UNU-WIDER, 2023).

The tax-to-GDP ratio is now much lower in Ethiopia than in other countries with similar levels of GDP per capita. Figure 1.2 plots tax-to-GDP ratios for all countries and years from 2010 to 2022. The black line is the level of tax-to-GDP that would be expected for a given level of GDP per capita. From 2010 to 2014, Ethiopia's tax-to-GDP ratio was in line with other countries with a similar level of GDP per capita, but it is now considerably lower. Ethiopia's tax-to-GDP ratio is also much lower than its peers: Uganda's tax-to-GDP ratio in 2022/23 was 13.1%, Kenya's was

15.2% and Rwanda's was 15.7%.[2] The median tax-to-GDP ratio in all other sub-Saharan African countries in 2021 was 13.2%, compared with 7.7% in Ethiopia in 2021/22[3] – a gap of 5.5 percentage points.

1.1 Objectives of this study

The general objective of this study is to explain the level and evolution of Ethiopia's tax-to-GDP ratio. Specifically, we seek to answer the following two questions:

1. Why is Ethiopia's tax-to-GDP ratio 5.5 percentage points lower than the median for other sub-Saharan African countries?
2. Why has Ethiopia's tax-to-GDP ratio fallen by 4.6 percentage points since 2015/16?[4]

For each of these questions, this report aims to quantify the relative importance of structural, policy and compliance-related factors. These are defined below.

- *Structural factors* is a broad term that refers to how the structure of Ethiopia's economy, or any other characteristics of Ethiopia that are not within the control of tax authorities, affects Ethiopia's tax-to-GDP ratio. For example, agriculture is very difficult to tax in low-income countries, because a large proportion of it is made up of non-monetised production, including products traded by barter and products grown for own-consumption. Ethiopia's large agricultural sector relative to other sub-Saharan countries is one structural factor that explains part of the gap in the level of the tax-to-GDP ratio.
- *Policy factors* refer to how policy choices on tax rates and tax bases affect Ethiopia's tax-to-GDP ratio.
- *Compliance-related factors* refer to the component of Ethiopia's low and falling tax-to-GDP ratio that cannot be explained by structural or policy factors.

Determining the relative importance of each of these three factors is not an exact science. The analysis – as will be discussed extensively throughout the report – is subject to a number of uncertainties arising from incomplete or erroneous data, strong assumptions, statistical error and other caveats. Particular caution should be taken with 'compliance-related factors', as it is defined to be what is remaining after accounting for structural and policy factors. If there are structural or

[2] All for fiscal year 2022/23, excluding social security contributions. The values for Uganda and Rwanda are gross of VAT refunds, but the value for Kenya is net of VAT refunds. Sources: Uganda – Uganda Ministry of Finance (not publicly available); Rwanda – Rwanda Revenue Authority (2023); Kenya – Kenya National Bureau of Statistics (2024).

[3] The median tax-to-GDP ratio in other sub-Saharan countries is only available up to 2021.

[4] Ethiopia's tax-to-GDP ratio peaked in 2014/15, but due to data availability this report focuses on the fall between 2015/16 and 2022/23.

policy factors that we do not accurately take into account – for example, undocumented or ad-hoc exemptions for certain activities – the share attributed to compliance-related factors may be too high.

Despite these uncertainties, separating out the three factors is important for policymakers and for any reform process. If Ethiopia's low and falling tax-to-GDP ratio was mainly about structural factors, it would call into question whether Ethiopia's growth model in recent years was compatible with its ambition to increase its tax-to-GDP ratio rapidly; it would then also be crucial for policymakers to think more about raising revenue from hard-to-tax sectors. If the low and falling tax-to-GDP ratio was mainly about tax policies or changes in tax policies, these policies would need to be urgently reviewed. If neither of these was the driver, the government's focus should be on improving compliance.

1.2 Methodology and data

This report uses a combination of different methodological approaches to quantify the contribution of structural, policy and compliance-related factors to Ethiopia's observed tax-to-GDP ratio performance. The main data sources are national accounts data for Ethiopia obtained from the Ministry of Planning and Development, macrodata from the World Bank, tax revenue data from the Ministry of Revenue for Ethiopia and the UNU-WIDER Government Revenue Dataset (UNU-WIDER, 2023) for other countries, taxpayer-level tax collection data for different taxes from the Ministry of Revenue, and transaction level data on import taxes from the Ethiopian Customs Commission. Information on Ethiopia's tax-to-GDP ratio in different years was obtained from the Ministry of Finance.

For the estimation of a benchmark tax-to-GDP ratio for Ethiopia, we use a random forest prediction model incorporating a large number of structural predictors. Data on structural predictors is taken from World Bank macrodata. The difference between the tax-to-GDP ratio predicted by the model and the median tax-to-GDP ratio of SSA countries is interpreted as the impact of structural factors on Ethiopia's tax-to-GDP ratio. To isolate the effect of differences in policy from differences in compliance, we directly compare Ethiopia's policy rates and exemptions for different taxes to those in other SSA countries. Differences between the model prediction and Ethiopia's reported tax-to-GDP ratio that cannot be explained by policy differences are attributed to differences in compliance.

To explain the fall in Ethiopia's tax-to-GDP ratio, we use bespoke approaches for each tax type. In each case, we try to identify changes in tax collection that are explained by changes in the tax base ('structural factors') and changes in tax collection that are explained by changes in tax rates and exemptions ('policy factors'). The remainder are attributed to differences in compliance.

For VAT, our main analytical tool is a full VAT gap analysis, which allows us to decompose the change in the VAT-to-GDP ratio into structural factors (changes due to the share of final consumption in GDP and changes in sectoral composition of the economy), policy factors (changes in the policy gap) and compliance-related factors (changes in the compliance gap). The VAT gap analysis uses a 'top-down' approach following the IMF RA-GAP VAT gap methodology (Hutton et al., 2019). The required data is taken from the 2015/16 Social Accounting Matrix prepared by Mengistu et al. (2019), national accounts data from the Ministry of Planning and Development, and VAT collection data from the Ministry of Revenue.

We supplement this analysis with a descriptive analysis of the different VAT administration systems in Ethiopia, which motivates the re-allocation of a substantial part of the change in the compliance gap to 'structural factors', as it was very likely driven by a fall in VAT withholding resulting from a fall in public investment.

For customs duties and surtax, there is little to explain, as the fall in tax collections as a share of GDP was almost exactly proportional to the fall in the value of imports as a share of GDP (changes in the composition of imports had a broadly neutral effect on tax collection). We use customs microdata from the Ethiopian Customs Commission to understand the fall in imports: we examine in which product categories imports fell the most, decompose the fall in the value of imports into a change in quantities and a change in prices, and assess the likely extent of import tax evasion via under-invoicing. We also assess the role of policy by reviewing previous work on the evolution of statutory import tax rates and import tax expenditures.

For corporate income tax, we decompose the fall in corporate income tax (CIT) collection relative to GDP by sector to be able to isolate changes stemming from changes in the structure of the economy. We also conduct a separate analysis of the profitability of the Commercial Bank of Ethiopia (CBE) using data from its annual report, as the CBE alone accounts for more than a quarter of the fall in CIT revenues. For Employment Income Tax (EIT), we use data from the Urban Employment Unemployment Survey to separate changes in policy from changes in the structure of the labour market.

Our supplementary analysis on the effect of conflict on tax collection draws on regionally disaggregated tax collection data and corporate tax microdata that allows us to identify a group of Tigray-linked companies (the 'EFFORT portfolio'). Our analysis of the measurement of Ethiopian GDP growth is a descriptive analysis drawing on macrodata for Ethiopia and regional peers, data on night-time lights measured by a satellite collected by the Colorado School of Mines, data on employment earnings from the Ethiopian Urban Employment Unemployment Survey, and data on aggregate consumption from the Ethiopia Socioeconomic Survey.

1.3 Report structure

The remainder of this report is structured as follows. Chapter 2 discusses our approach to estimating a benchmark tax-to-GDP ratio for Ethiopia and compares it to alternative approaches. Chapter 3 uses that benchmarking approach, in combination with a tax-by-tax comparison with tax policies in comparable countries, to answer our first research question – why is Ethiopia's tax-to-GDP ratio lower than those in other sub-Saharan African countries? Chapters 4 and 5 address our second research question – why has Ethiopia's tax-to-GDP ratio fallen so much since 2015/16? Chapter 4 focuses on VAT, customs duty and surtax, corporate income tax and employment income tax, which together account for nearly all of the fall in the tax-to-GDP ratio. Chapter 5 discusses two general issues that may have affected the tax-to-GDP ratio across all tax instruments: the impact of the recent conflict and the possibility that GDP growth has been overstated. The report concludes with a set of recommendations on specific policy proposals, and recommendations for tax policymaking and tax administration processes.

A report by the Policy Studies Institute (PSI) has also examined Ethiopia's tax-to-GDP ratio (Yesineh, Gebrewolde and Alamerie, 2023). The focus of the PSI report was the impact of certain structural factors on the tax-to-GDP ratio, the impact of recent tax expenditures, and specific challenges related to the organisation of the tax administration. This report builds on the PSI report by considering how a much wider set of factors may have affected Ethiopia's tax-to-GDP ratio, and we conduct a much broader evaluation of tax policy beyond just tax expenditures. The PSI report is also complementary to this report, especially as it goes into more detail on specific tax administration issues in Ethiopia than this report.

1.4 Notes

Note on the measure of the tax-to-GDP ratio

The primary measure of the tax-to-GDP ratio in this report is based on monthly revenue reports from the MoR and quarterly regional revenue reports from the Fiscal Policy Department of the MoF. This measure excludes VAT refunds and social security contributions. Appendix A presents tables of the aggregate tax-to-GDP ratio and the tax-to-GDP ratio for each individual tax instrument, dating back to 2014/15. When comparing Ethiopia's tax-to-GDP ratio with those of other countries, we also use a measure of the tax-to-GDP ratio excluding VAT refunds and social security contributions where data are available.

The methodology by which the tax-to-GDP ratio is calculated in Ethiopia is currently being reformed. The existing methodology double-counts taxes collected by the federal government and then transferred to regions as both federal and regional tax revenue. If these regional transfers are

excluded, the tax-to-GDP ratio would have been 6.8% in 2022/23, having fallen from 11.8% in 2015/16 (or 5.0 percentage points).

For this report, we continue to use the old methodology to calculate the tax-to-GDP ratio, as detailed tax revenue by tax instrument going back multiple years is not available using the new methodology. The choice of measure is unlikely to affect the conclusions on the fall in the tax-to-GDP ratio, as the fall is very similar under both measures (4.6 percentage points versus 5.0 percentage points). If regional transfers are accounted for, the amount of the gap between Ethiopia and other countries attributable to compliance-related factors (i.e. what remains after taking structural and policy factors into account) would be around 1.9 percentage points instead of 1.2 percentage points.

Note on dates

This report only uses the Gregorian calendar for dates. Fiscal years in Ethiopia run from July to June of the following year. FY 2022/23 therefore refers to the period between July 2022 and June 2023. In some cases, it is necessary to compare a value for the Ethiopian fiscal year with a value reported by another country. In this case, we compare it with the first year of the fiscal year, so that FY 2022/23 is compared with 2022 for other countries.

2. Estimation of a benchmark tax-to-GDP ratio for Ethiopia

Key findings

1. Ethiopia has a much lower tax-to-GDP ratio than other sub-Saharan African countries. In 2021/22, Ethiopia's tax-to-GDP ratio was 7.7%, while the median for other SSA countries was 13.2% – a gap of 5.5 percentage points. However, Ethiopia's economic structure is also quite different from many other SSA countries, which could explain a large portion of the gap.

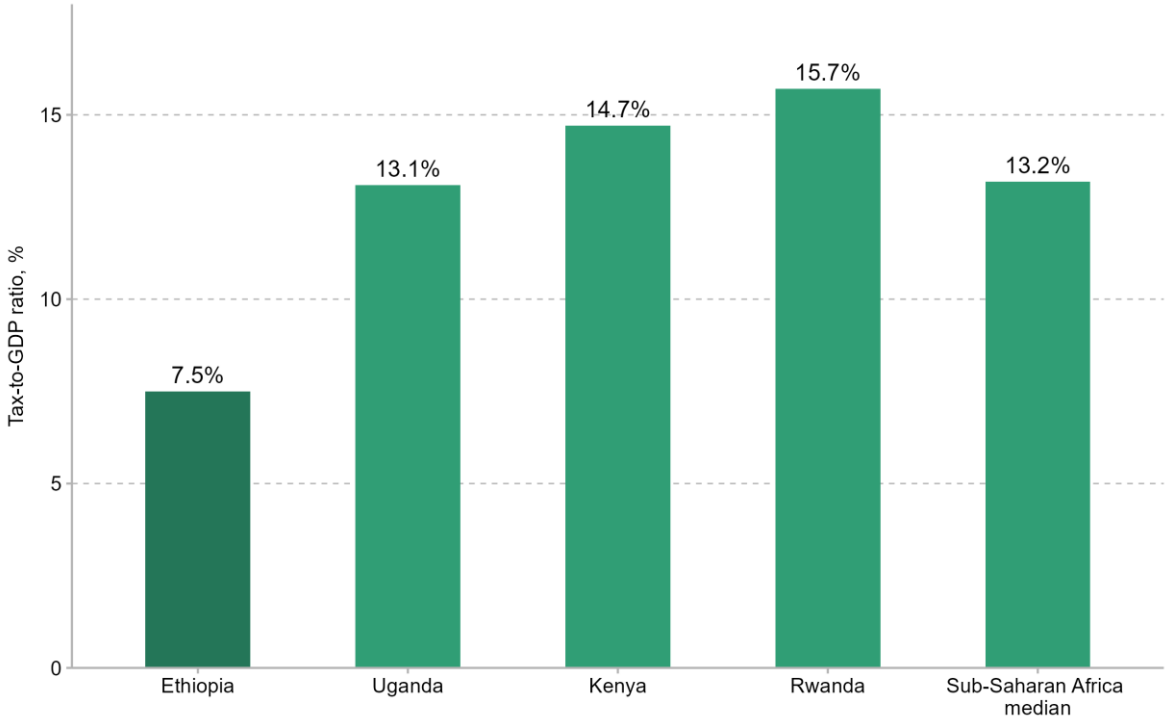
2. There are various methods available for estimating a benchmark tax-to-GDP ratio that would account for these structural factors. The main method used in this report is a random forest prediction model incorporating a large number of predictors. These predictors include, but are not limited to, Ethiopia's low GDP per capita, high share of agriculture in GDP, low share of manufacturing in GDP and low urbanisation rate, all of which are correlated with low tax-to-GDP ratios.

3. Using this method, we obtain a predicted tax-to-GDP ratio for Ethiopia of 11.0%. Around 2.2 percentage points of the gap between Ethiopia and other SSA countries is explained by differences in the structure of Ethiopia's economy and its demographics, leaving a gap of around 3.2 percentage points that is attributable to policy and compliance-related factors.

2.1 Comparison of Ethiopia's tax-to-GDP ratio with other SSA countries

Ethiopia has a much lower ratio of tax to GDP than other sub-Saharan African (SSA) countries. As shown in Figure 2.1, Ethiopia's tax-to-GDP ratio was 7.7% in 2021/22, while the median for other sub-Saharan African countries was 13.2% – a gap of 5.5 percentage points. In the same year, the tax-to-GDP ratio was also substantially higher in Uganda (13.1%), Kenya (14.7%) and Rwanda (15.7%).

Figure 2.1. Tax-to-GDP ratios for Ethiopia and comparable countries, 2021



Note: Sub-Saharan Africa median is the median average of all countries in sub-Saharan Africa where data are available, excluding Ethiopia. For Ethiopia, data is for FY 2021/22. Values for other countries are from UNU-WIDER (2023).

Source: Ministry of Finance for Ethiopia. UNU-WIDER (2023) for other countries.

However, Ethiopia's economic structure is also quite different from many other SSA countries, which could explain a large portion of the gap. Tax-to-GDP ratios, especially for low- and middle-income countries, are heavily constrained by the structure of the economy and other structural features of the country that are largely outside the control of tax policymakers (Besley and Persson, 2014). As Figure 2.2 shows, Ethiopia is quite different from other SSA countries.

Figure 2.2. Ethiopia and SSA medians for selected economic variables

Note: SSA line is the median average of all countries in sub-Saharan Africa where data are available in a given year, excluding Ethiopia. Data for macroeconomic variables for Ethiopia are at the fiscal-year level, such that 2021 refers to FY 2021/22. Industry excluding manufacturing refers to the mining, construction and electricity/water sectors. In Ethiopia, the construction sector comprises 95% of industry excluding manufacturing.

Source: National accounts statistics from the Ministry of Planning and Development for Ethiopian macroeconomic statistics. World Bank (2023b) for other countries, and for urbanisation for Ethiopia.

Ethiopia is a highly agricultural and rural economy, even by the standards of sub-Saharan Africa. Agriculture accounted for 37.6% of GDP in 2021/22, compared with the median of 19.0% for other SSA countries. Ethiopia is correspondingly much more rural than the rest of sub-Saharan Africa: only 22% of Ethiopians lived in urban areas in 2021, compared with 45% in the rest of SSA.

Agriculture is widely considered to be the hardest-to-tax sector (Rajaraman, 2004) given that a large portion of agricultural output is self-consumed and therefore not monetised. Studies consistently find that agriculture as a share of GDP is a strong predictor of low tax-to-GDP

(Benitez et al., 2023; McNabb, Danquah and Tagem, 2021). While Ethiopia does have a rural land-use fee and an agricultural income tax – lump-sum taxes based on the size of agricultural land holdings – these taxes have very low rates of between 20 birr and 60 birr per hectare depending on region (Komatsu et al., 2022) and consequently raise less than 0.1% of GDP.

Manufacturing, on the other hand, is considered to be heavily taxed in low-income countries, as it tends to have a low share of informality compared with agriculture, services or retail (Ulyssea, 2018). Manufacturing as a share of GDP was lower in Ethiopia, at 4.2% in 2021/22, than the median of 9.5% for SSA countries in 2021.

Although manufacturing is relatively minor in Ethiopia, industry excluding manufacturing – which includes construction, mining and electricity/water – accounted for 18.5% of GDP in 2021/22, compared with the SSA median of 14%. In Ethiopia, construction accounts almost the entirety of industry excluding manufacturing.

Imports, which are heavily taxed in low-income countries, were 18.4% of GDP in 2021/22 in Ethiopia, compared with the SSA median of 34.0% in 2021. Exports in Ethiopia – at just 8.2% of GDP in 2021/22 – are also much lower than the SSA median of 27.9% in 2021 and have also fallen significantly. Exports are generally less heavily taxed than imports (exports are zero-rated for the purposes of VAT, and export duties in Ethiopia are minimal), but may proxy activity by the formal sector.

The goal of the remainder of this chapter is to quantify the role of structural factors (including the composition of Ethiopia's economy, its demographics and other factors largely out of the control of the tax authorities) in explaining the 5.5 percentage point gap in tax-to-GDP between Ethiopia and other countries. This is equivalent to deriving a *benchmark* tax-to-GDP ratio for Ethiopia, which in contrast to the simple median average of tax-to-GDP ratios in other SSA countries would account for these structural factors. The difference between the benchmark and the median average of other SSA countries can then be interpreted as an estimate for the effect of structural factors on Ethiopia's tax-to-GDP ratio.

2.2 Commonly used approaches for benchmarking the tax-to-GDP ratio

The most common approach to benchmarking a country's tax-to-GDP ratio is to estimate a country's tax potential using stochastic frontier analysis (SFA). *Tax potential* is the maximum tax-to-GDP ratio a country could achieve given its economic and demographic structure. SFA is a statistical technique to infer a country's tax potential from the actual tax-to-GDP ratios of countries with similar characteristics. Exactly how 'similar' is defined depends on the model used (see Cyan,

Martinez-Vazquez and Vulovic, 2013; Fenochietto and Pessino, 2013; Langford and Ohlenburg, 2015; McNabb, Danquah and Tagem, 2021; Benitez et al., 2023).

A different approach, which Cyan et al. (2013) describe as the 'traditional approach' uses a predicted tax-to-GDP ratio as the benchmark. The predicted tax-to-GDP ratio is a different object of interest from tax potential: instead of the country's maximum attainable tax-to-GDP ratio, it is the tax-to-GDP ratio one would expect a country to have based on its characteristics. Predicted tax-to-GDP ratios have commonly been obtained using ordinary least squares (OLS) or fixed-effects regression based on a small set of predictor variables.

2.3 Strengths and weaknesses of these models

The tax potential approach has the advantage of being the most common, which means that a large range of estimates are available for different countries and from different authors. It also provides intuitive guidance for policymakers on what is achievable in a given country's context. On the other hand, tax potential estimates have been criticised for setting unrealistically high expectations for the tax-to-GDP ratio by focusing on the maximum that could possibly be raised rather than the median amongst similar countries (McNabb, Abramovsky and Hart, 2024; Gallien, Lees and Mascagni, 2024). Unfortunately, the estimates are highly sensitive to the predictor variables chosen and to model assumptions, so different authors can come to very different conclusions on a country's tax potential.[5]

The tax potential approach also does not directly serve the purpose of benchmarking for this study, which is to determine how much of the difference between Ethiopia's tax-to-GDP ratio and the median tax-to-GDP ratio for other SSA countries can be explained by structural factors. Knowing that Ethiopia is collecting less than the maximum it possibly could be collecting based on its economic and demographic structure does not help to answer this question, as other sub-Saharan African countries are also collecting less than the maximum they possibly could be collecting based on their economic and demographic structure (Benitez et al., 2023).

The 'traditional approach' is better-suited to the purposes of this study, but in its most common forms also requires strong assumptions about the functional form of the relationship between explanatory factors and the tax-to-GDP ratio. Past benchmarking exercises using this approach

[5] In particular, SFA requires strong assumptions on the error distribution. There is also no consistent approach on whether governance variables should be included as part of the tax potential component or the inefficiency component. SFA is also based on a linear model, and the literature by default assumes a linear relationship between structural factors and tax-to-GDP (McNabb, Danquah and Tagem, 2021).

have also typically only included a handful of observable characteristics, so important structural factors may have been missed.

Our approach in this report can be interpreted as a modernised version of the 'traditional approach' that allows us to relax these functional form assumptions. We also include a much broader set of control variables than has traditionally been done, plausibly capturing a greater range of structural differences between different countries. In addition to results from our model, we report other authors' results from using SFA approaches in section 2.7 for comparison.

2.4 The benchmarking model employed for this report

The benchmarking model employed for this report uses a random forest to predict tax-to-GDP ratios using a wide set of predictor variables. A random forest is a class of machine learning algorithm. This report does not go into the specifics of random forest modelling, but the method is preferred over other approaches such as linear regression because it is highly flexible and able to deal with a large number of predictor variables.[6]

We consider predictors that can plausibly affect the tax-to-GDP ratio and that are also available for most countries in the world from 2010 to 2021. We do not include any variables relating to policy or tax administrative choices, in order to isolate the extent to which Ethiopia's low tax-to-GDP ratio is driven by factors that are largely outside the direct influence of tax policy or tax administration. As discussed in more detail in the interpretation of the model predictions, it is not possible to fully isolate policy or administrative factors, as they may be correlated with the included predictor variables. Where possible, we use the same predictors as in the related literature (McNabb, Danquah and Tagem, 2021). These are:

- **Economic variables:** GDP per capita; GDP growth; agriculture, industry, manufacturing, investment, public investment, foreign direct investment (FDI), imports and exports as a share of GDP; agriculture and manufacturing share of employment; inflation; unemployment; share of income accrued by the top 10% of adults; self-employment.
- **Demographic variables:** total population; share of the population aged between 15 and 64; share of the population under 15; average fertility rate; urban population share; population density; female labour force participation.

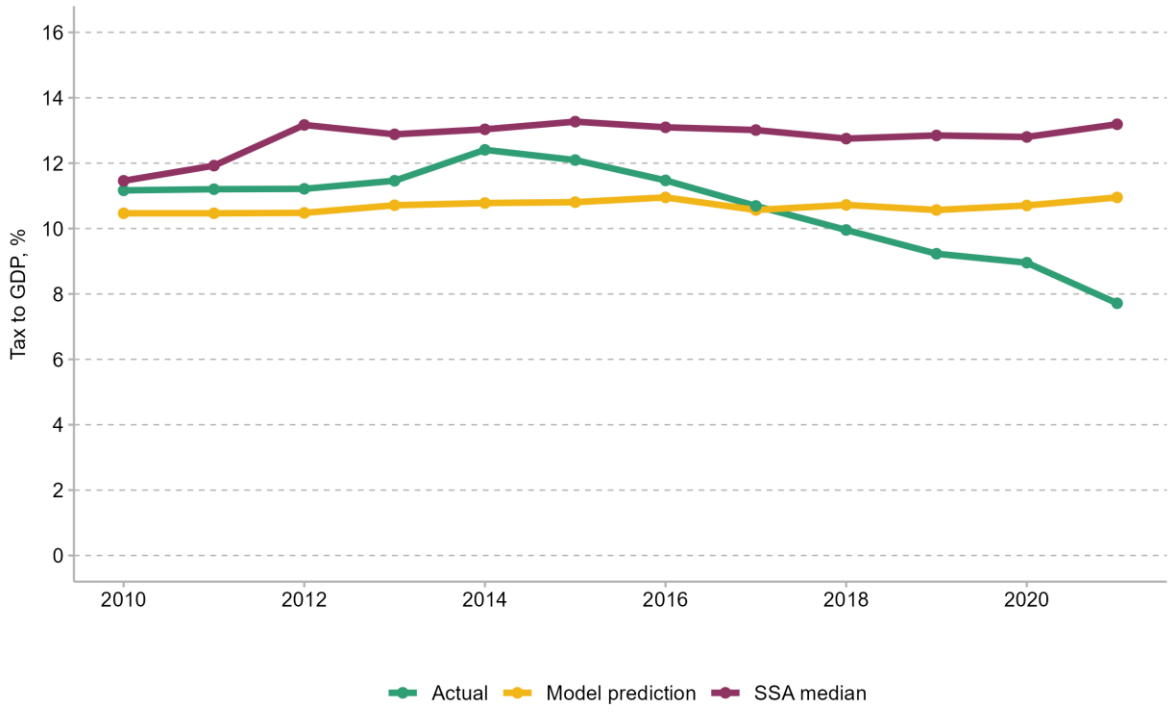
[6] For a general introduction to random forest prediction models, see chapter 8 of James et al. (2021).

- **Infrastructure/endowments-related variables:** mobile phone and fixed broadband subscribers per capita; share with access to electricity; oil production; electricity use and CO_2 emissions per capita; arable land per capita; cereal yield per capita.
- **Other variables:** region (Europe; Middle East and North Africa; other Asia and Oceania; sub-Saharan Africa; Americas); year.

A prediction is generated using two steps. The first is to determine the relationship between tax-to-GDP and structural factors in countries that are not Ethiopia (known as training the model). The second step is to feed Ethiopia's structural factors into the model, to generate predictions for tax-to-GDP for Ethiopia. More details on the data sources, data cleaning and prediction approach are given in Appendix C.

2.5 Findings from the benchmarking model

Figure 2.3. Predicted tax as a % of GDP for Ethiopia (actual and predicted) and SSA median



Note: Years are labelled such that, for example, 2014 refers to the fiscal year 2014/15 for Ethiopia. 'SSA median' is the median for all SSA countries for which data are available in a given year, excluding Ethiopia. See the text for explanations of the model prediction. Appendix C contains additional notes on the sample selection and the prediction model.

Source: Actual – Ethiopian Ministry of Finance. SSA median – UNU-WIDER (2023). See text for details of predictors used in the model.

Figure 2.3 presents the actual tax-to-GDP ratio in Ethiopia, Ethiopia's tax-to-GDP ratio as predicted by the model, and the median average tax-to-GDP ratio for SSA countries excluding Ethiopia. The predicted tax-to-GDP ratio based on Ethiopia's economic and demographic structure is 11.0% of GDP in 2021. This is higher than Ethiopia's actual tax-to-GDP ratio of 7.7% in 2021/22, leaving a gap of around 3.2 percentage points even when compared with a prediction that takes into account its weaker macroeconomic, demographic and other 'structural factors'. Note that the actual tax-to-GDP ratio is at the fiscal-year level, but the SSA median and the model prediction are reported at the calendar-year level, as this is the level reported by the underlying data sources.

However, the prediction does explain part of the gap between Ethiopia and other SSA countries. The gap between the predicted tax-to-GDP ratio (11.0%) and the median for other SSA countries (13.2%) in 2021 is 2.2 percentage points, meaning that Ethiopia would be expected to have a lower tax-to-GDP ratio than other SSA countries as its economic and demographic structure is generally correlated with a low tax-to-GDP ratio.

The fall in Ethiopia's tax-to-GDP ratio is not predicted by the model. Between 2015 and 2021, predicted tax-to-GDP for Ethiopia grew by 0.1 percentage points, whereas actual tax-to-GDP fell by 4.4 percentage points. Prior to 2017, Ethiopia's actual tax-to-GDP ratio was higher than the model's prediction – the possible reasons for this are discussed in more detail in Chapter 4.

To better understand which of the predictor variables are driving the overall model prediction, we run the model starting from a small set of predictor variables, and gradually build up to the final model. The analysis is presented in Figure 2.4.

The top left panel in Figure 2.4 shows the predicted tax-to-GDP ratio for Ethiopia when only region, year and GDP per capita are used to predict the tax-to-GDP ratio. This can be interpreted as the 'simplest' model, and the prediction is close to the median for other SSA countries in Figure 2.3.[7]

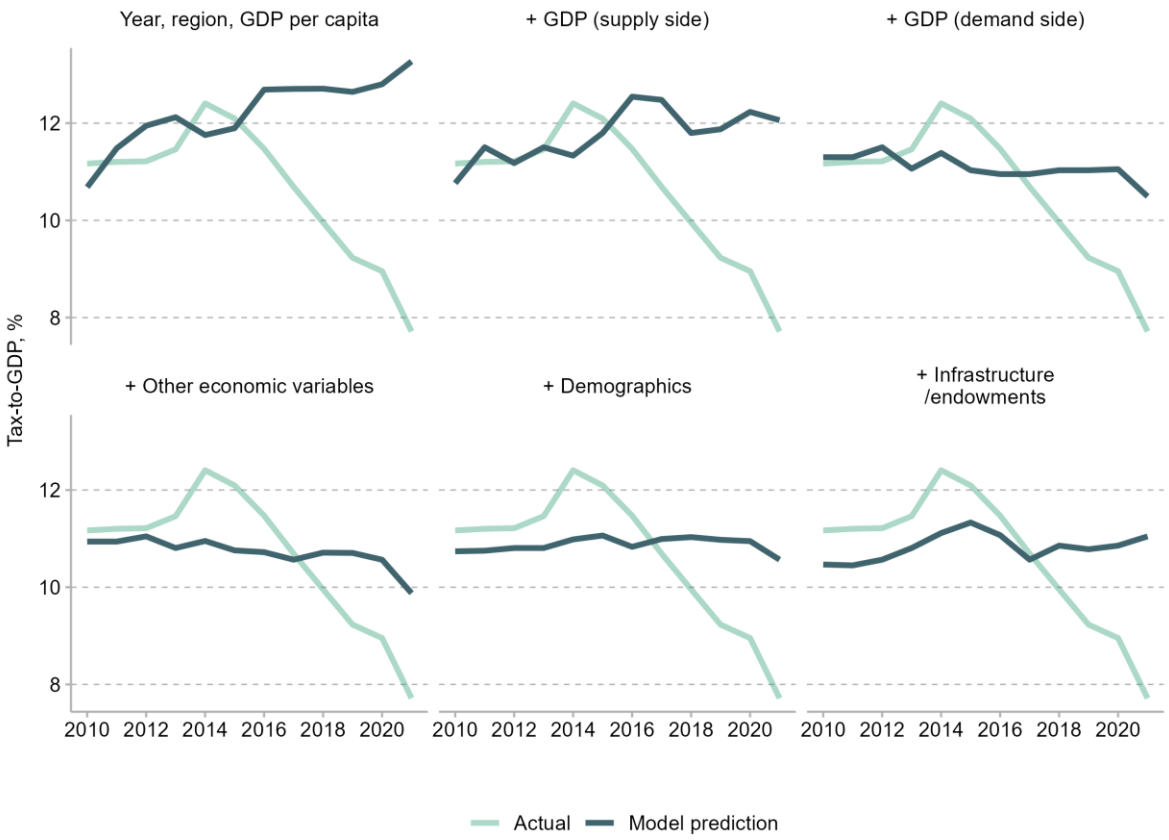
Reading across, the next panel adds variables related to the supply side of GDP – namely, agriculture, industry and manufacturing as a share of GDP, and the share of agriculture and manufacturing in total employment. The upper right panel then adds variables related to the demand side of GDP – namely, imports, exports, FDI, public investment and total investment as a share of GDP. When these variables are added, the model is based solely on macroeconomic variables (as well as year and region). This version of the model predicts a lower tax-to-GDP ratio

[7] The prediction in the top left panel is very close to the median for sub-Saharan African countries in Figure 2.3but is not exactly the same, because it also includes GDP per capita as a predictor and because of the prediction uncertainty inherent in the random forest model.

for Ethiopia than the full model (at 10.5%) and predicts a decline in the tax-to-GDP ratio of 0.5 percentage points between 2015 and 2021.

When variables related to other economic variables, demographics and infrastructure are added to the model in subsequent panels, the predicted fall disappears. Although macroeconomic variables in Ethiopia are predictive of falling tax-to-GDP, other 'development' indicators such as the urbanisation rate, the working-age population share and energy access are still improving and cancel out the fall in the predicted tax-to-GDP ratio estimated using 'macroeconomic' variables only.

Figure 2.4. Breakdown of the model prediction for Ethiopia



Note: 'Actual' refers to actual tax-to-GDP in Ethiopia, as in previous graphs. The top left panel is the prediction for a model that only uses the year, region and GDP per capita to predict tax-to-GDP. The top middle panel adds in the variables related to the supply side composition of GDP: agriculture, manufacturing and industry as a percentage of GDP, and agricultural and manufacturing employment as a percentage of total employment. The top right panel adds in variables related to the demand side of GDP: exports, imports, investment, public investment and foreign direct investment as a percentage of GDP. The bottom left panel adds in other variables related to the economy: unemployment, inflation, GDP growth, self-employment and the share of income that goes to the top 10% of adults. The bottom middle panel adds in variables related to demographics: total population, share of the population aged between 15 and 64, share of the population under 15, average fertility rate, urban population share, population density and female labour force participation. The bottom right panel adds in variables related to infrastructure/endowments: mobile phone and fixed broadband subscribers per capita, share with access to electricity, electricity use per capita and CO_2 emissions per capita, arable land per capita and cereal yield per capita. See Appendix C for details on sample selection and the model.

Source: See Appendix C.

2.6 Interpreting the model predictions

It is important to stress that the model predictions are based on the relationship between the tax-to-GDP ratio and structural factors in other countries, which may not hold for Ethiopia. For example, it may be the case that tax revenues in Ethiopia are more sensitive to the size of the agricultural sector than they are in Kenya, Uganda or any of the other countries that the model is estimated on, because of special factors in Ethiopia. The model prediction should therefore be interpreted as a benchmark level of the tax-to-GDP ratio; it cannot by itself tell us how important (changes in) economic conditions have been for the Ethiopian tax-to-GDP ratio.

An important illustration of this point is the effect of the fall in public (government and state-owned enterprise) investment from its peak in 2014/15. Although public investment as a share of GDP is one of the inputs into the model, the model is unlikely to fully account for the effects of a public investment boom-and-bust on tax-to-GDP, given that very few other countries in the world experienced one between 2010 and 2021. As discussed in greater detail in Section 4.1, Ethiopia's reliance on the public sector withholding VAT revenue from private sector firms means that its tax-to-GDP ratio is likely to be particularly sensitive to public investment, and may explain why the actual VAT-to-GDP ratio substantially overperformed relative to the predicted VAT-to-GDP ratio in the mid-2010s.

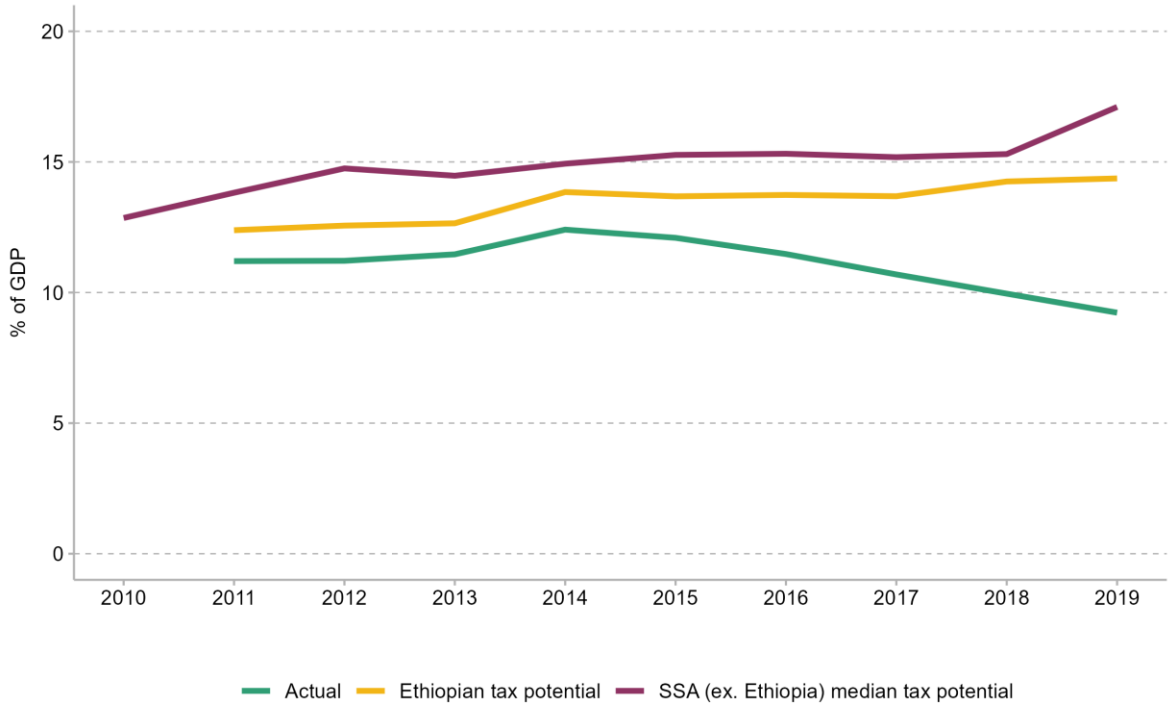
Due to these country-specific factors, as well as differences in tax policy and tax administration, it is not unusual for countries to be some way away from their model-predicted benchmark. The model's 90% confidence interval for Ethiopia's tax-to-GDP in 2021/22 is [6.3%, 17.7%]. Although this confidence interval is wide, the model's central prediction of 11.0% is still a useful indicator of roughly where Ethiopia's tax-to-GDP ratio is expected to be.

Finally, it should be noted that the tax-to-GDP ratio predicted by the model reflects not only factors outside the control of tax policy and administration, but also policy and administrative choices that are correlated with them. For example, countries with a lower ratio of imports to GDP have higher average trade taxes.[8] This may explain why, although we show in Section 4.2 that the fall in trade tax revenue in Ethiopia is almost exactly proportional to the fall in imports, the model predicts that trade taxes in Ethiopia will fall less than they actually do.

[8] The correlation coefficient between the trade-tax-to-GDP ratio and the imports-to-GDP ratio in 2020 was –0.27. The sample includes all countries where trade-tax-to-GDP is available from UNU-WIDER and imports-to-GDP is available from the World Bank, in the year 2020.

2.7 Comparison with results from stochastic frontier analyses

Figure 2.5. Tax potential results for Ethiopia and SSA from McNabb et al. (2021)



Source: Actual tax-to-GDP is as in Figure 2.3. Tax potential for Ethiopia and other SSA countries is derived from the TRE specification from McNabb, Danquah and Tagem (2021).

Here we present results from stochastic frontier analysis by McNabb, Danquah and Tagem (2021) here as a robustness check on our prediction model results. Figure 2.5 presents Ethiopia's 'tax potential' according to the SFA, in addition to actual tax-to-GDP and the median of tax potential for other SSA countries. In 2014/15, Ethiopia's tax potential is estimated to have been 13.8% of GDP by McNabb et al. (2021). This was 1.4 percentage points above actual revenue (12.4%), meaning that Ethiopia was collecting 90% of its tax potential.

Ethiopia's tax potential in 2019/20 is estimated to have increased to 14.4%, which was 5.1 percentage points higher than actual revenues in that year, meaning that Ethiopia was only collecting 64% of its tax potential. Since 2014, Ethiopia's tax potential has averaged 1.6 percentage points below the SSA median tax potential. The results from McNabb et al. (2021) are in line with our prediction model, despite the approaches being very different. Based on the relationship between structural factors (such as GDP composition and demographics) and tax-to-

GDP in other countries, Ethiopia would be expected to have a lower tax-to-GDP ratio than other SSA countries. However, it does not appear that tax potential has fallen in Ethiopia.[9]

Estimates of tax potential using stochastic frontier analysis vary. Ultimately, deciding which countries are 'statistically similar' to Ethiopia is an assumption-heavy exercise, and different choices on assumptions result in different estimates for tax potential. For example, McNabb et al. (2021) find that Ethiopia's tax potential could be between 13.0% and 24.5%, depending on the exact assumptions used. The International Monetary Fund (Grote et al., 2019), using its own methodology, estimates Ethiopia's tax potential to have been 19.9% in 2018/19. Using yet another version of the stochastic frontier approach, the World Bank estimates Ethiopia's tax potential in 2020 to have been 15.0%. Exactly how different assumptions behind SFA lead to different estimates of tax potential is technical and beyond the scope of this report.

[9] The sets of predictors used in the random forest approach and in McNabb et al.'s approach overlap but are not the same.

3. Tax-by-tax comparison of Ethiopia's tax-to-GDP ratio to other SSA countries

Key findings

1. The unexplained gap of 3.2 percentage points between Ethiopia's actual 2021/22 tax-to-GDP ratio and its benchmark can be roughly decomposed into a 1.2 percentage points gap for direct taxes, 1.1 percentage points for VAT, 0.9 percentage points for excise and 0.3 percentage points for import taxes (modelling uncertainty and missing data account for a discrepancy of 0.4 percentage points).

2. On direct tax, Ethiopia's policy choices cannot account for the remaining gap, as tax rates are broadly comparable or higher than in other SSA countries and exemptions are roughly comparable. Similarly, import taxes in Ethiopia are if anything higher than in other SSA countries.

3. On VAT, only around 0.6 percentage points of the shortfall can be accounted for by policy choices, of which the most important are a slightly lower standard rate of VAT than the median for SSA countries (accounting for up to 0.4 percentage points) and the *de facto* VAT exemption on fuel (accounting for up to 0.2 percentage points).

4. On excise tax, policy choices likely account for *more* than the estimated remaining gap for excise; we conclude that as of the 2021/22 fiscal year, Ethiopia could take in roughly 1.5% of GDP more in excise taxes if it adopted similar policies to other SSA countries. The bulk of the extra tax could be collected on fuel, but extra revenue could also be collected on airtime and on financial transactions.

5. The remaining 1.2 percentage point gap between the benchmark and Ethiopia's actual tax-to-GDP ratio is likely due to weaker compliance – primarily on direct taxes and VAT – in Ethiopia than in other countries, over and above the compliance differences that can be explained by structural factors.

This chapter uses the benchmarking model introduced in the previous chapter to assess, across tax instruments, what share of the gap in the tax-to-GDP ratio between Ethiopia and other SSA countries can be accounted for by structural factors. We then move on to a comprehensive comparison of tax policy choices in Ethiopia and other SSA countries to assess for each tax instrument what share of the remaining gap can be explained by differences in tax policy choices. Where data on the tax policy choices of other countries are difficult to obtain, we focus on comparisons with Kenya, Rwanda and Uganda.

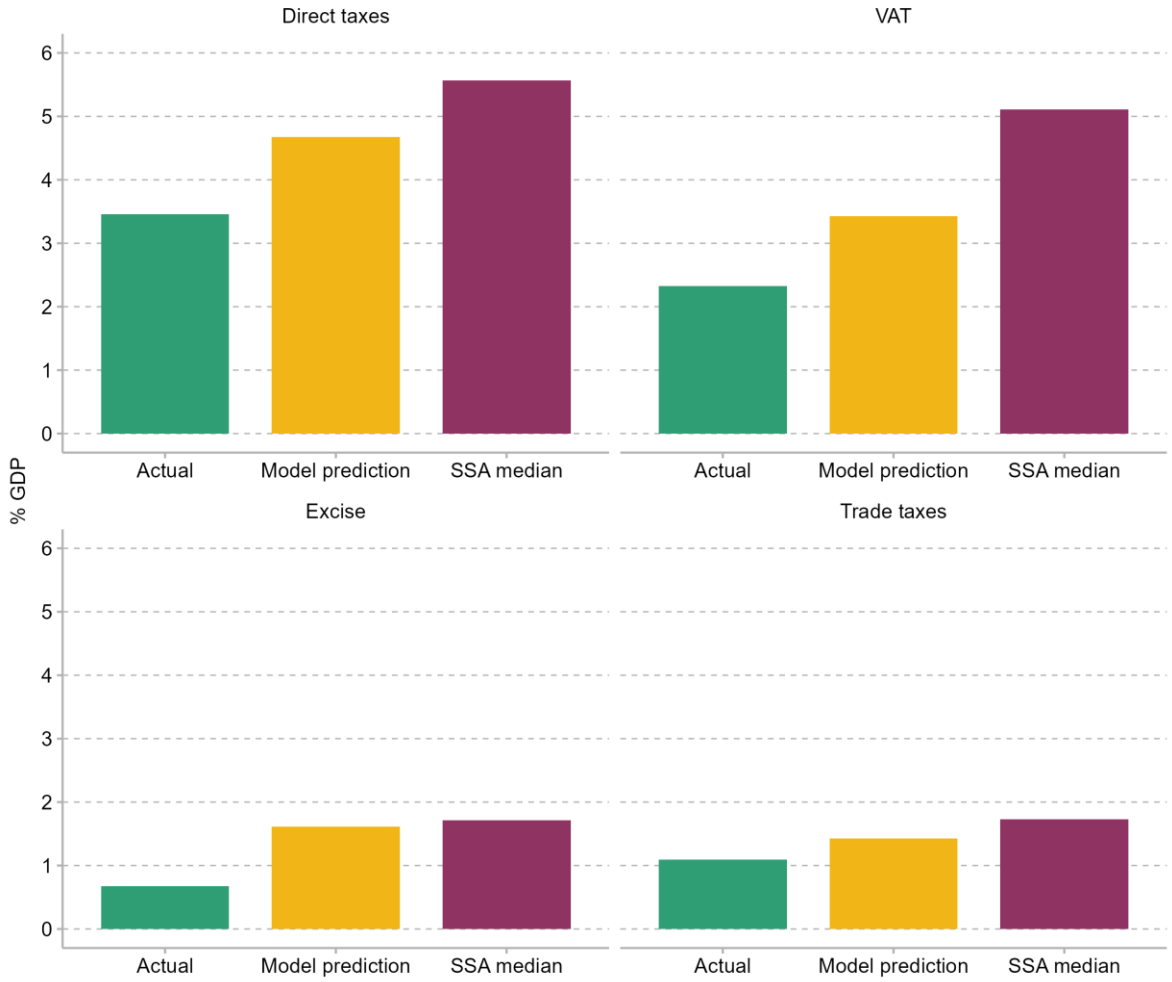
3.1 Comparison of actual and benchmark tax-to-GDP ratios

To assess how structural factors affect different tax instruments, the benchmarking exercise is repeated separately for direct taxes (which mostly comprise personal income tax and corporate income tax), VAT, excise taxes and trade taxes (customs duties and surtax). Figure 3.1 presents the results for 2021. The results should be understood as approximate: due to modelling uncertainty and missing data in comparator countries, there is a discrepancy between the overall benchmark and the sum of benchmarks for individual tax instruments of 0.4 percentage points.

The gap between Ethiopia's predicted tax-to-GDP ratio and that for other SSA countries is largest for direct taxes and VAT. Ethiopia's direct-tax-to-GDP ratio and VAT-to-GDP ratio are predicted to be 4.7% and 3.4% of GDP in 2021/22 respectively, whereas the SSA medians were 5.6% and 5.1%. Ethiopia's actual direct-tax-to-GDP ratio and VAT-to-GDP ratio are below the model's prediction, at 3.5% and 2.3% in 2021/22 respectively. This suggests that a gap of 1.2 percentage points for direct taxes and 1.1 percentage points for VAT cannot be explained by structural factors.

The gap between predicted and actual excise-tax-to-GDP is also large. Ethiopia was predicted to collect 1.6% of GDP in excise in 2021/22, whereas it only collected 0.7% (including excises on imports), leaving a gap of 0.9 percentage points. In contrast, at 1.1% in 2021/22, actual trade tax revenue is only slightly lower than the model's prediction of 1.4%, which is also lower than the SSA median (1.7%).

Figure 3.1. Predicted direct tax, VAT, excise and trade taxes as a % of GDP for Ethiopia in 2021



Note: For consistency with the UNU-WIDER Government Revenue Dataset, VAT and excise include VAT and excise on imports respectively, whereas trade taxes exclude VAT / excise on imports but include surtax. 'SSA median' refers to the median for all other SSA countries where data are available except Ethiopia. See Appendix C for further details on the methodology.

Source: Actual – Ethiopian Ministry of Finance. SSA median – UNU-WIDER (2023). See text for details of predictors used in the model.

3.2 Comparison of tax policies

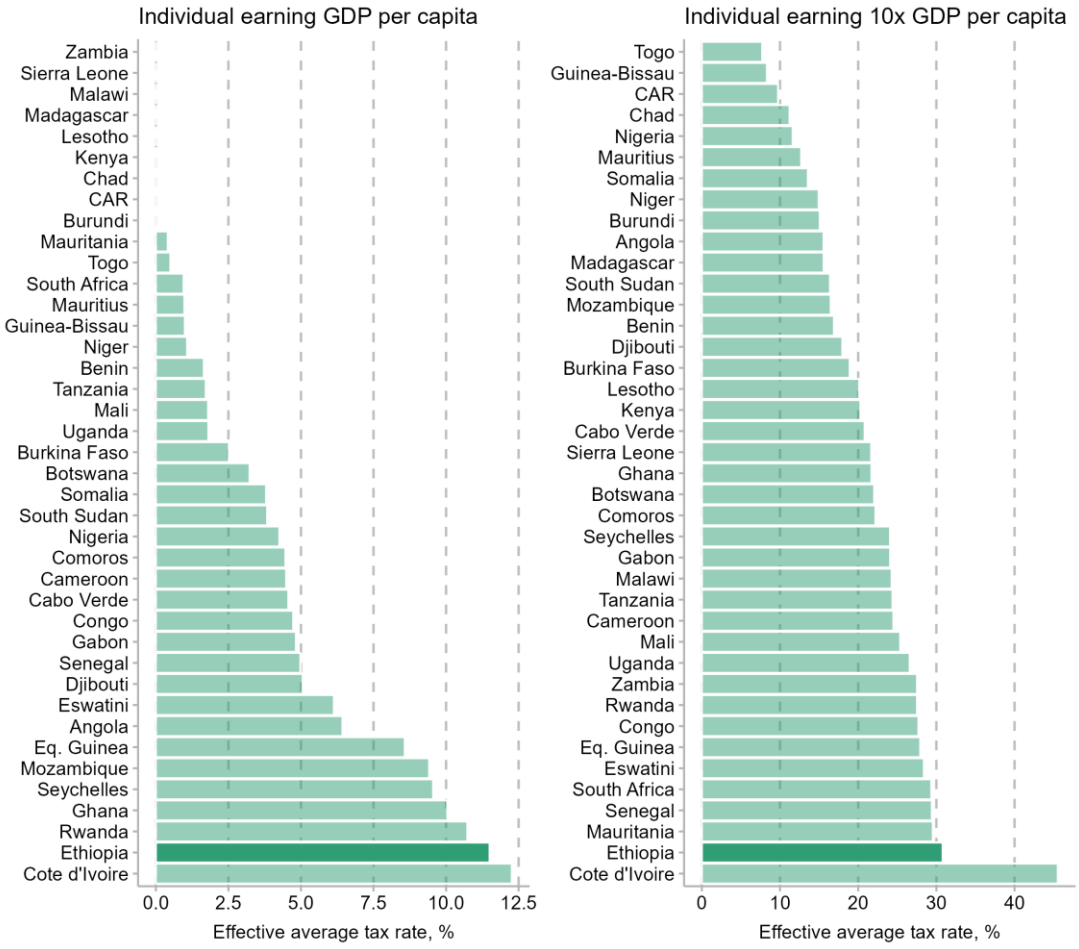
Direct taxes

Personal income taxes

Ethiopia's PIT-to-GDP ratio is 1.9%, compared to a median of 3.8% in other SSA countries where data is available. There are several ways to compare personal income tax (PIT) policies across countries, as countries differ in both rates and the location of thresholds. We consider two options:

the average tax rate paid by an individual earning the equivalent of GDP per capita and an individual earning 10 times this amount. The former is an approximate measure of the tax burden on 'middle earners',[10] while the latter captures the tax burden on relatively 'high earners'. As high earners tend to pay a disproportionate amount of tax relative to their number, the tax burden on high earners may be more relevant for understanding why PIT revenue varies across countries.

Figure 3.2. Effective PIT rate for an individual earning the equivalent of GDP per capita and 10 times GDP per capita



Note: The values for Ethiopia are for 2020/21. Data for other countries are reported by McNabb and Granger (2023) for 2020. Employment income is assumed to be the only source of income, and social security contributions are excluded. GDP per capita – at the annual level – is assumed to be distributed evenly across months.

Source: McNabb and Granger (2023). GDP per capita – Ministry of Planning and Economic Development for Ethiopia; World Bank (2023b) for other countries.

[10] This measure was previously used by McNabb and Granger (2023) for cross-country comparisons of personal income taxes.

Ethiopia's average tax rate on middle earners – those earning the equivalent of GDP per capita – is very high compared with other SSA countries, as Figure 3.2 shows. In 2020/21 (the latest year for which cross-country data on tax policy are available), an individual earning Ethiopia's GDP per capita (42,500 birr per year in 2020/21) would pay 11.5% of their income in taxes, which is second-highest after Côte d'Ivoire and substantially above the median for other SSA countries of 2.5%. Many countries, including Kenya, have no income tax at all for middle-income earners due to high exemption thresholds/credits.

Ethiopia also has a relatively high average tax rate for high earners. An individual earning 10 times GDP per capita (425,000 birr per year in 2020/21) would pay 30.8% of their income in taxes. The median for other SSA countries is 21.7%.

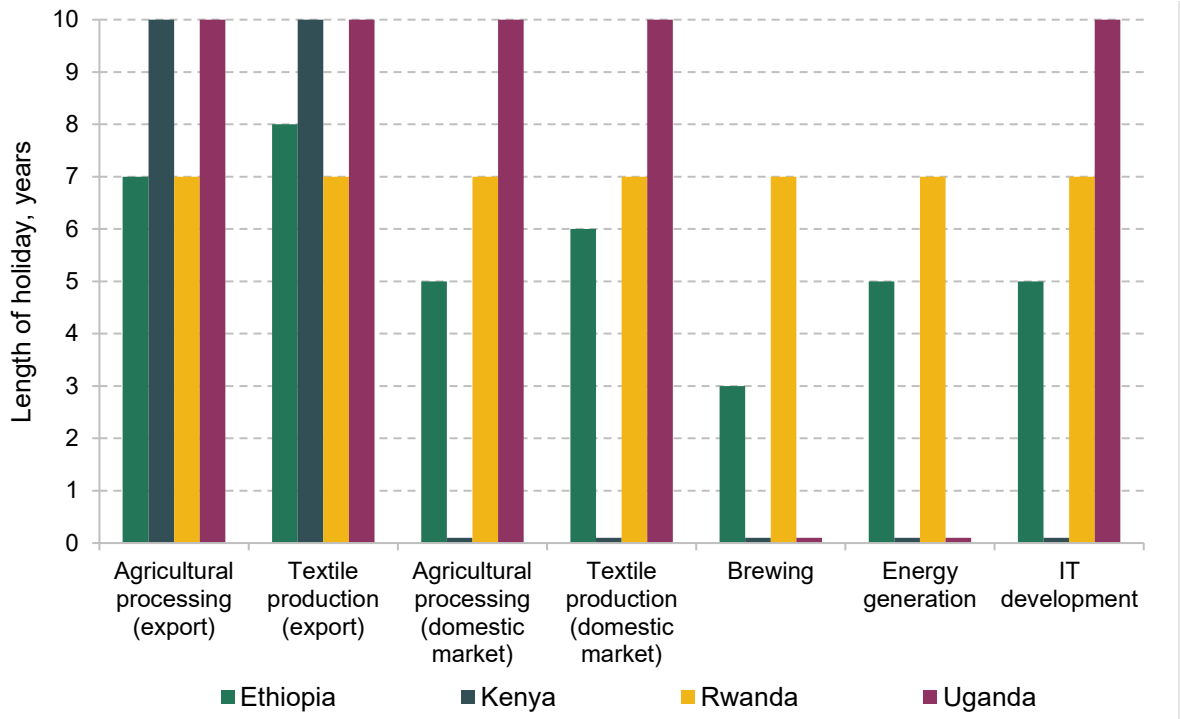
One of the reasons that average PIT rates in Ethiopia are so high is that nominal tax thresholds have not been changed since 2016/17 despite high levels of inflation. This did not translate into a higher employment income tax revenue because of slow wage and employment growth, especially in the public sector. This is discussed in more detail in Section 4.4.

Corporate income taxes and tax holidays

Ethiopia's CIT-to-GDP ratio is 1.2%, compared to 3.2% for other SSA countries where data is available, Ethiopia's statutory corporate income tax (CIT) rate of 30% is exactly equal to the median for other SSA countries (Figure B.3 in Appendix B). However, the headline CIT rate can be very different from the actual corporate income tax burden, as companies can make use of capital deduction allowances, loss carry-forward provisions and tax holidays to reduce their tax liability. One measure that takes these factors into account is the effective tax rate, which Bachas et al. (2023) define as the tax paid by a company on its accounting profits in a given year. They find that the effective tax rate, averaged across all firms in Ethiopia between 2010/11 and 2016/17, is 17.5%. This is within the range of other SSA countries in their sample (they find 12.1% in Rwanda, 15.1% in Uganda, 14.6% in Eswatini and 27.3% in Senegal). However, the analysis in Bachas et al. (2023) does not cover firms that do not file tax returns or file under a tax holiday in Ethiopia, and thus does not fully capture the cost of tax holidays in Ethiopia.

Instead, we compare Ethiopia's tax holidays directly with those in Kenya, Rwanda and Uganda. In the absence of more detailed data on revenue forgone, we make a simple comparison of the duration of CIT incentives because, all else being equal, we would expect the revenue forgone from the tax holiday to increase with the duration of the tax holiday. As tax holidays are highly industry-specific, we consider several example industries: agricultural processing and textile manufacturing (for both export and domestic markets), brewing, energy generation and IT development (the last three for the domestic market only). Figure 3.3 shows the length of holiday, in years, that a company operating in this industry is entitled to receive, provided that it meets the requirements detailed in the notes to the figure.

Figure 3.3. Length of tax holiday for example activities



Note: In Ethiopia, the length of the tax holiday is based on investment outside the Addis Ababa / Oromia Special Zone. For agricultural processing for the domestic market, it varies from four to six years depending on the type of product; we have taken the midpoint of five years. Companies operating in industrial parks and exporting at least 80% of their output are eligible for an additional two-year tax holiday. In Kenya, companies must be located in an export processing zone and export 80% of their output to be eligible for a tax holiday. In Rwanda, the minimum investment is 50 million USD. Energy projects must be at least 25 megawatts. Rwanda's regulations state that companies involved in manufacturing, IT development and power generation are eligible for a maximum of seven years of tax holidays, but it is unclear what factors will determine whether the company receives a seven-year holiday or less. It is also unclear whether brewing is included in the manufacturing sector. Rwanda offers a 0% CIT rate to companies that relocate their headquarters to Rwanda. In Uganda, for incentives under Section 21(1)(af), the qualifying investment must be 10 million USD (for foreign investors). 70% of raw materials must be sourced locally, and 70% of total employees and 70% of the wage bill must be local.

Source: Ethiopia – Investment Incentive Regulation (No. 517/2022). Kenya – PwC (https://taxsummaries.pwc.com/kenya/corporate/taxes-on-corporate-income). Rwanda – Rwanda Development Board (https://rdb.rw/why-rwanda/investment-incentives/) and East African Community (https://www.eac.int/investment-climate-and-incentives/investment-incentives/243-sector/investment-promotion-private-sector-development/investment-guide/2475-rwanda-standard-incentives-for-investors). Uganda – Namunane, Carson and McNabb (2021).

Ethiopia is generally in the 'middle of the pack' when it comes to the overall length of tax holidays for the sample sectors considered. Kenya's tax holidays are closely targeted at exports: it offers ten-year tax holidays for manufacturers that export a high percentage of their sales, but not for domestically oriented manufacturing or other sectors. Uganda offers ten-year tax holidays for textile manufacturing and agro-processing (for both domestic and export markets) and for IT development. Rwanda offers a seven-year tax holiday for all the example sectors. Ethiopia's tax holidays for these sample sectors vary between three and eight years.

However, Ethiopia is much more generous in terms of the requirements to qualify for a tax holiday. In Rwanda, the minimum investment required for a foreigner to qualify for tax holidays is USD 50 million. In Uganda, not only is the qualifying investment for a foreigner USD 10 million, but the company must also source 70% of its raw materials locally, and citizens must account for 70% of the workforce and 70% of the wage bill. In Ethiopia, the minimum capital requirement for foreigners is only 200,000 USD. This may mean that the revenue forgone from tax holidays is higher in Ethiopia, even if the length of tax holidays is comparable to those in other countries.

Withholding taxes

Withholding taxes are taxes deducted at source on certain categories of payments. In Ethiopia, as in many other developing countries, payments of royalties, dividends, interest income and technical service fees are subject to withholding taxes.[11] Withholding taxes are applicable to both residents and non-residents, though rates are generally higher for non-residents. Withholding taxes are an important backstop against international tax avoidance: it has been well documented that some multinational companies use inflated royalty or interest payments to shift profits from high-tax countries to low-tax countries (Janský and Palanský, 2019; Tørsløv, Wier and Zucman, 2022).

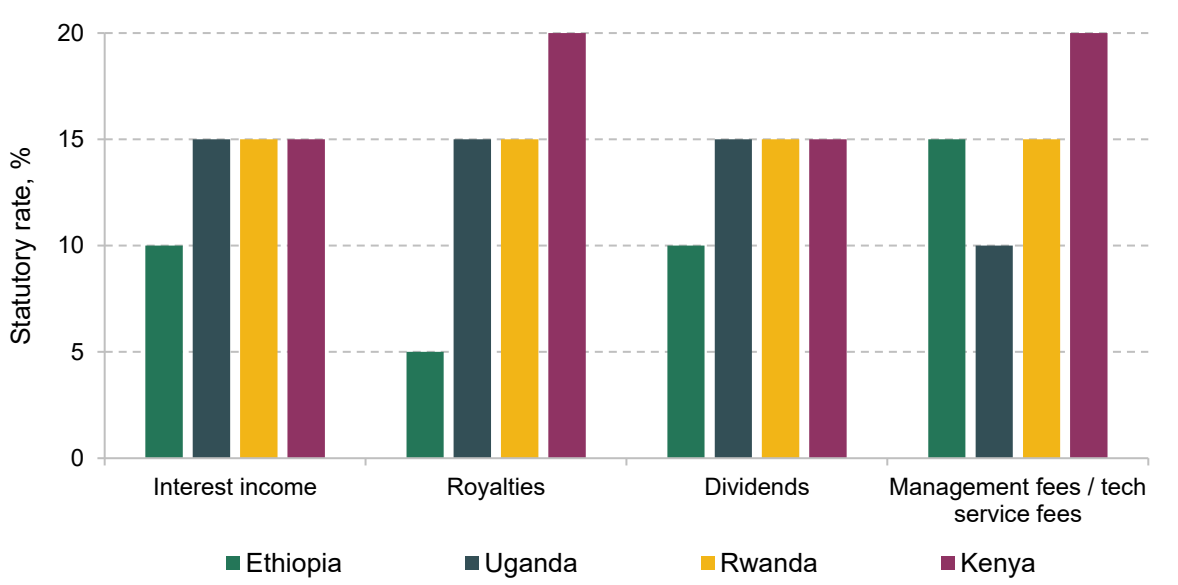
Figure 3.4 presents statutory withholding tax rates on interest, royalties, dividends and technical service fees. Due to the difficulty of obtaining data, rates are presented for Ethiopia, Uganda, Rwanda and Kenya only. Ethiopia's statutory withholding rates on interest income (10%), royalties (5%) and dividends (10%) are all lower than those of other East African countries.

Ethiopia collected 3.9 billion ETB in withholding taxes on dividends (and games of chance), 4.3 billion ETB on interest income and 1.1 billion ETB on royalties in 2021/22, totalling 0.15% of GDP.[12] If the tax rates on these categories were increased to 15% (the median for the other selected East African countries), and there were no behavioural responses to the tax, tax revenue could be expected to increase by 6.3 billion ETB, or 0.11% of GDP. This is an approximation, as statutory withholding tax rates are even lower for certain categories of income (e.g. the withholding tax rate on interest from deposits held at a financial institution is 5%) and withholding taxes on some income are covered by rates specified in double tax treaties, which do not change when statutory tax rates change.

[11] In Ethiopia, large business-to-business payments, imports and gambling winnings are also subject to withholding tax. We do not compare withholding tax rates on these payments with those in other countries.

[12] At both the federal and regional level. Data are not available for management fees.

Figure 3.4. Statutory withholding tax rates in East African countries



Note: Tax rates for payments made to non-residents. The tax rate on interest income in Kenya is for the category 'other', i.e. not on bearer bonds or government bonds. The tax rate on interest income in Ethiopia is also for 'other', i.e. not on savings deposits at a financial institution.

Source: https://taxsummaries.pwc.com/, retrieved September 2023.

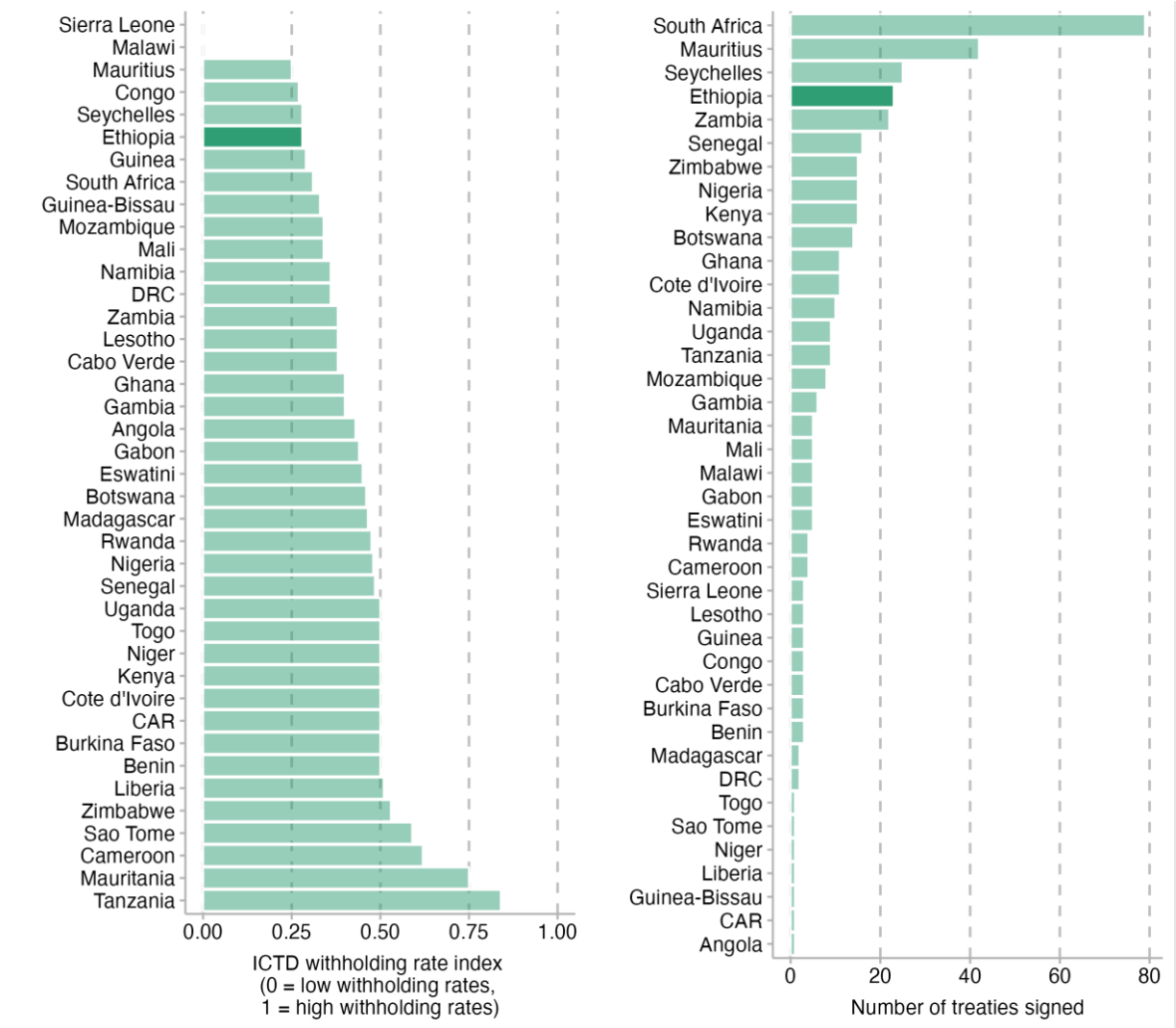
Countries can also enter into a double tax treaty, which often leads to reductions in withholding tax rates. For example, Ethiopia's statutory withholding tax rates on dividends is 10%, but the rate is reduced to 5% for Chinese investors under the terms of the Ethiopia–China double tax treaty. Ethiopia has signed a large number of tax treaties with low withholding tax rates, as Figure 3.5 shows.

The left panel of Figure 3.5 shows that only Sierra Leone, Malawi, Mauritius, the Republic of the Congo and the Seychelles have lower withholding tax rates in the tax treaties they have signed than Ethiopia, according to the ICTD index. Ethiopia has signed 23 tax treaties, which is more than any other country bar South Africa, Mauritius and the Seychelles. Mauritius and the Seychelles are noted tax havens (Tørsløv, Wier and Zucman, 2022), and tax havens benefit from having a large number of tax treaties to promote themselves as a location for multinationals to base their subsidiaries.

Tax treaties can be costly: the revenue forgone for SSA countries because of a single tax treaty is estimated to be between 0.01% and 0.2% of GDP (McGauran, 2013; Leduc and Michielse, 2021), depending on the size of the FDI stock and the difference between statutory and treaty rates. This analysis does not account for the possibility that tax treaties may increase the tax-to-GDP ratio by encouraging international investment. It is not possible to directly estimate the revenue forgone because of Ethiopia's tax treaties, due to limited data on FDI stocks held in Ethiopia by foreign

investors in the IMF Coordinated Direct Investment Database. We are also aware that the statutory, rather than treaty, withholding rates are applied even when a treaty is in force.

Figure 3.5. Withholding tax rates specified by tax treaties and number of treaties signed



Note: The left panel is the ICTD withholding rate index for SSA countries. The index is a measure of how high or low withholding taxes on dividend, royalty, interest and technical service fee income is, relative to other countries. Values closer to 1 mean that the country generally has high withholding tax rates, and values closer to 0 mean that the country generally has low withholding tax rates. The right panel is the number of double tax treaties signed by SSA countries. The graphs are presented for all SSA countries that have a double tax treaty.

Source: ICTD Tax Treaty Explorer (Hearson, 2021).

VAT

Apart from direct taxes considered together, VAT is the tax instrument where Ethiopia most substantially underperforms in terms of revenues relative to its benchmark. We compare the standard VAT rate and the scale of exemptions in Ethiopia with those in other countries, as these are the two policy choices that tend to matter the most for overall VAT revenue.

Ethiopia's VAT rate of 15% is lower than Kenya's (16%), Rwanda's (18%), Uganda's (18%) and the median of other SSA countries (17.5%) that have a VAT, as Figure B.2 in Appendix B shows. As VAT is a large source of tax revenue, small differences in tax rates can be important. Ethiopia raised 2.3% of GDP in 2021/22 from VAT. If the VAT rate were raised from 15% to the SSA median of 17.5%, a simple calculation suggests that Ethiopia could expect an additional 0.4 percentage points on the VAT-to-GDP ratio. This is an upper-bound estimate, as it does not account for the possibility that taxpayers respond to the VAT increase through increased evasion or reduced real economic activity.

Policy choices to exempt or reduce-rate certain products also affect the VAT base. In general, there are relatively few exempted products in Ethiopia that are not exempted in other East African countries (see Table B.1 in Appendix B for a list of the key exempted products in Ethiopia, Kenya, Rwanda and Uganda).[13] The main product categories that are currently exempted in Ethiopia, but to our knowledge are not exempted in Kenya, Rwanda or Uganda, are electricity, vegetable oil, sugar and pasta. The exemptions for vegetable oils, sugar and pasta (in addition to eggs and baby formula) were only introduced relatively recently, to alleviate food price inflation.[14] In contrast to other countries, vegetables, fruit and unprocessed meat are subject to VAT in Ethiopia. In addition to the official exemptions, VAT on fuel has gone uncollected in Ethiopia until recently, in a similar manner to excise on fuel.

To assess the extent to which VAT exemptions can explain Ethiopia's low tax-to-GDP ratio, we would ideally compare the cost of VAT exemptions and other policy provisions in Ethiopia with those in other countries. A VAT gap model – which will be formally introduced in Section 4.1 – estimates the expenditure gap (which is one way of measuring the cost of VAT exemptions) to be 0.6% of GDP. However, we do not have comparable estimates for other countries, as the IMF's analysis of the VAT gap in other countries is confidential. An alternative approach is just to focus on the cost of exemptions that are not commonly found in other countries: fuel, electricity, vegetable oils, sugar and pasta. These are estimated to cost 0.24% of GDP, of which the non-collection of fuel VAT alone costs 0.2% of GDP.[15]

These estimates suggest that VAT exemptions are not a major contributor to Ethiopia's low tax-to-GDP ratio. Section 4.1 will also show that new VAT exemptions represent a small fraction of

[13] The comparison is with other East African countries as it is difficult to compile a list of exempted products in all SSA countries.

[14] Imported varieties of these goods were exempt from VAT from June 2020 and domestically produced varieties were exempt from September 2021.

[15] These costings are the change in the expenditure gap as a result of removing exemptions for these specific products (but otherwise keeping the policy structure as is for all other products). This assumes that traders of currently exempt products will comply and pay VAT when the exemption is removed. If compliance is not perfect, then the cost of the exemptions may be less than 0.24% of GDP.

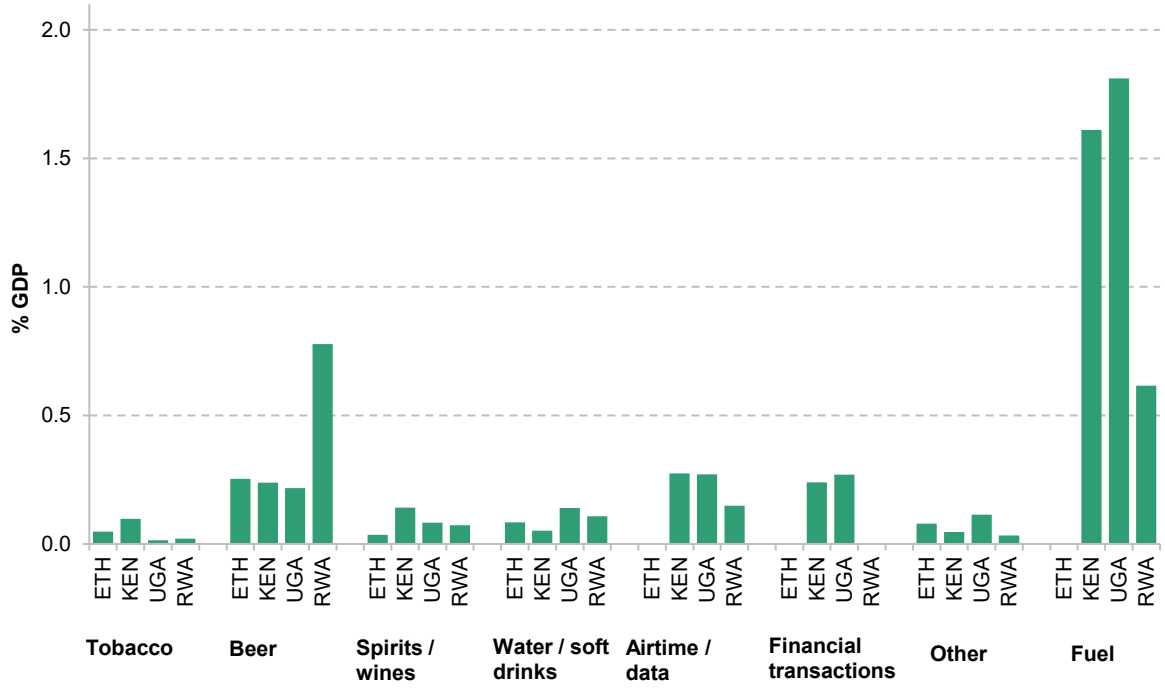
the decline in the tax-to-GDP ratio. However, the list of VAT exemptions in this report is based on documentation provided to us by the Legal Department of the Ministry of Finance. There may be ad-hoc or undocumented VAT exemptions for specific projects or importers that do not appear on this list or of which we are not otherwise aware.

Excise tax

Ethiopia's excise-to-GDP ratio is persistently lower than the average for other SSA countries, as well as the model's prediction based on Ethiopia's structural factors. Figure 3.6 breaks down the excise-to-GDP ratio further for specific goods categories, to identify the source of underperformance. Due to the difficulties of obtaining consistent data for disaggregated excise collections, only comparisons for Kenya, Rwanda and Uganda are presented.

Ethiopia's underperformance on excises is mostly due to low collections on fuel and to a lesser extent due to the non-taxation of airtime or financial transactions. Ethiopia collected almost nothing from excise taxes on fuel in 2021/22, while Rwanda collected 0.6% of GDP, Kenya collected 1.6% of GDP and Uganda collected 1.8% of GDP. Ethiopia's low fuel excise revenues as of 2021/22 were due to a difference between the official excise tax rate and the rate applied in practice. The official fuel excise tax rate was 30% until May 2023, which was relatively high by SSA standards (Granger et al., 2021). However, the actual excise tax rate applied by the Ethiopian Petroleum Supply Enterprise (EPSE) – which is the monopoly importer of fuel in Ethiopia – was far lower. In 2010, the ad-valorem fuel tax was converted to a specific duty of 2.39 birr per litre, which was equivalent to 30% of the import price of fuel at the time. The EPSE has since continued to charge 2.39 birr per litre without the permission of the Ministry of Finance (Grote et al., 2019), despite high inflation since 2010, resulting in fuel excise revenue of less than 0.1% of GDP. The same issue has affected VAT collection on fuel. In 2010, the 15% VAT rate was converted to 1.55 birr per litre (equivalent to 15% of the import and excise price in 2010) and was also not uprated in line with inflation. The revenue consequences of the non-collection of fuel VAT are discussed below.

Figure 3.6. Excise tax collections as a % of GDP for main excise categories, 2021/22



Note: All figures are for domestic excise (as excise collections on imported goods are not disaggregated from customs duties in all countries), except for excise on fuel. The data presented are for FY 2021, except for tobacco, spirits and water in Rwanda, which are for FY 2020. Financial transactions include mobile money transactions. 'Other' is domestic excise categories that are not comparable across countries. Fuel excise in Kenya is the sum of standard fuel excises, road development levy, petroleum regulatory levy and petroleum surcharge.

Source: Ethiopia – Ethiopian Ministry of Finance (not publicly available). Uganda – Uganda Ministry of Finance (not publicly available). Kenya – Kenya National Bureau of Statistics (2023) and OECD (2024). Rwanda – Rwanda Revenue Authority (2021) and Rwanda Revenue Authority (2022).

In May 2023, the official rate of fuel excise was cut from 30% to 15%. At the same time, the EPSE was instructed to apply the full 15% excise rate, rather than the outdated rate of 2.39 birr per litre. VAT will also be applied in full. Assuming a pre-tax cost of petrol of 0.85 USD per litre, a 15% excise is equivalent to a specific rate of 0.13 USD per litre (6.6 birr per litre). This is substantially lower than excises in Kenya (0.43 USD per litre) and Uganda (0.39 USD per litre), but in line with Rwanda (0.18 USD per litre).[16] Ethiopia also does not levy excises on financial transactions (including mobile money transactions), which raise 0.24% of GDP in Kenya and 0.27% of GDP

[16] The price of 0.85 USD per litre is the average pre-tax price in the UK for refined petroleum (gasoline), as of August 2023 (Bolton, 2023). Excises in local currency are 51 KES per litre (https://www.epra.go.ke/wp-content/uploads/2023/05/EPRA-Fuel-Price-Press-Release-May-2023.pdf), 1,450 UGX per litre (https://taxsummaries.pwc.com/uganda/corporate/other-taxes) and 183 RWF per litre (https://taxsummaries.pwc.com/rwanda/corporate/other-taxes). Exchange rates are 117.87 KES = 1 USD, 3,689.82 UGX = 1 USD, 1,030.31 RWF = 1 USD and 51.76 ETB = 1 USD, which are the values reported by the World Bank as the average for 2022 (World Bank, 2023b), and 0.82 GBP = 1 USD (exchange rate as of September 2023).

in Uganda. In addition, Ethiopia did not tax airtime or internet data in 2021/22, excises on which raised between 0.15% and 0.27% of GDP in other East African countries, but it introduced an excise on airtime and internet data of 5% in May 2023. The new excise rate is lower than that in Kenya (20%), Uganda (12%) or Rwanda (10%).[17] The revenue implications of the updated excise on fuel and the new excise on airtime will not be known until the end of FY 2023/24.

Ethiopia collects a similar amount to the median for other East African countries for the other common excise tax categories (tobacco, beer, spirits, bottled water and soft drinks). We therefore do not make a detailed comparison of excise tax policy on these products.

Trade taxes

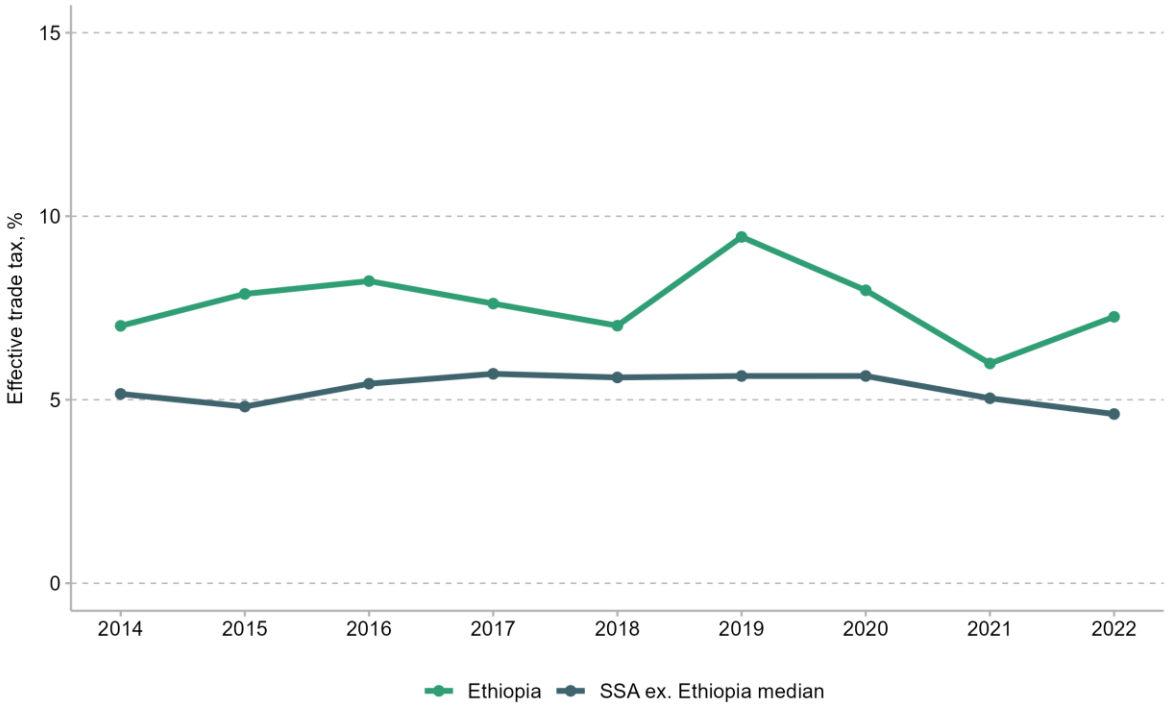
Ethiopia's average, unweighted, tariff rate across all products is 20.3% as of the 2021 tariff book, and the average for just customs duties is 14.9%.[18] This is substantially higher than the median for SSA countries of 9.2% (in 2020, the latest year for which such data are available) (World Bank, 2023b). [19] However, the unweighted average tariff across all products is not particularly informative as to the level of trade tax rates, as imports are much more likely to occur in lower-taxed products such as food.

[17] https://www.theeastafrican.co.ke/tea/business/excise-duty-on-airtime-rings-up-gloom-across-ea-region-3473946.

[18] Import taxes are applied in a complicated way in Ethiopia. The CIF+tax value is equal to CIF×(1+Customs Duty)×(1+Excise)×(1+VAT)×(1+Surtax) + CIF×Withholding + CIF×SWL. We want to know the tax rate for 'pure' trade taxes, which are customs duty, surtax and the social welfare levy (SWL). To do this, we take the ratio of the CIF+tax value to the CIF+(VAT, Excise and Withholding), the latter of which is equal to CIF×(1+VAT)×(1+Excise) + CIF×Withholding.

[19] The specific measure in the World Bank's World Development Indicators is 'Tariff rate, applied, simple mean, all products (%)', code TM.TAX.MRCH.SM.AR.ZS.

Figure 3.7. Effective trade tax on imports



Note: Values for trade taxes to GDP and imports to GDP in Ethiopia are at the fiscal-year level, such that 2022 refers to FY 2022/23. Values for trade taxes to GDP for other countries are reported at the calendar-year level by UNU-WIDER but may originally be at the fiscal-year level. Imports for other countries are reported at the calendar year by the World Bank. The effective trade tax is equal to trade taxes over total imports (including goods and service imports). Trade taxes refer to customs duty and surtax.

Source: UNU-WIDER (2023) and World Bank (2023b).

A better comparison of trade taxes is the effective trade tax rate, which is equal to total trade tax revenue as a percentage of total imports. The value for Ethiopia and the median of other SSA countries are shown in Figure 3.7.

Ethiopia's effective trade tax has generally been higher than that of other countries. The effective trade tax, or the ratio of customs duty and surtax to total imports, was 7.3% in Ethiopia in 2022/23. The median effective trade tax for other SSA countries has fluctuated around 5%, standing at 4.6% in 2022.

The effective trade tax is based on imports as reported in the national accounts, which also include service imports (which are not taxed via customs). This is to facilitate comparison across countries. A better measure of the tax burden is customs duty and surtax revenues as a percentage of goods imports, which has increased slightly. This is discussed in more detail in Section 4.2.

3.3 Discussion: why is the tax-to-GDP ratio lower in Ethiopia than in other countries?

The previous chapter has sought to explain to what extent the gap between Ethiopia's tax-to-GDP ratio and the sub-Saharan African median of 13.2% could be explained by the structure of Ethiopia's economy. A model based on the correlations between a large number of structural factors, including the composition of Ethiopia's economy, its demographics and other factors that are largely out of the control of tax authorities, predicts Ethiopia to have a tax-to-GDP ratio of 11.0% based on these structural factors. We therefore attributed 2.2 percentage points of the gap as arising due to differences in structural factors between Ethiopia and other countries.

This chapter has shown that a further portion of the gap can be explained by policy differences, and in particular by Ethiopia not collecting excises on fuel and the absence of excises on financial transactions or airtime. There are two reasonable approaches to quantify how much this contributes to the gap in tax-to-GDP ratios between Ethiopia and other countries. One approach is to take the difference between the actual and predicted excise-tax-to-GDP ratio from Figure 3.1, which is 0.9 percentage points. An alternative approach is to take the difference between excise tax collections for fuel, financial transactions and airtime between Ethiopia and the median of Kenya, Rwanda and Uganda, which is 2.1 percentage points. Both measures have their drawbacks: the first approach does not isolate excise tax revenue for specific tax categories and may be implicitly predicting excise tax rates, whereas excises in Kenya, Rwanda and Uganda may not be representative of other SSA countries. As a compromise, we take the midpoint of 1.5 percentage points to be the gap attributed to Ethiopia's low or absence of excises on fuel, financial transactions and airtime.

Ethiopia's headline VAT rate (15%) is also lower than the median of other SSA countries with a VAT (17.5%). A simple calculation shows that if Ethiopia raised its VAT rate to 17.5%, it could expect an increase in the VAT-to-GDP ratio by 0.4 percentage points (relative to its 2021/22 level). We have already noted this is an overestimate as it does not take into account behavioural responses to an increase in the VAT rate, such as increased evasion or reduced real economic activity. It is also not exactly correct to say that 0.4 percentage points of the gap in tax-to-GDP ratios between Ethiopia and the SSA median can be explained by Ethiopia's low VAT rate: some of the countries included within the SSA comparison sample do not have a VAT, and having a VAT in itself is associated with increased revenues (Keen and Lockwood, 2010). Bearing these issues in mind, we stress that *at most* 0.4 percentage points of the gap is associated with Ethiopia's lower VAT rate.

The gap due to VAT exemptions is harder to quantify, as we do not know the cost of VAT exemptions in other countries. A simple approach is to focus on the products that are exempt in

Ethiopia and are generally not exempt in other countries, which are fuel, electricity, vegetable oils, sugar and pasta. These are estimated to have cost 0.24% of GDP in 2021/22. The non-collection of VAT on fuel alone is estimated to have cost 0.2% of GDP. We include this in the gap attributable to 'policy factors', although it may be more than offset by other countries exempting products that are not exempt in Ethiopia.

Other tax policy choices are unlikely to explain the remaining gap in the tax-to-GDP ratio between Ethiopia and other SSA countries. Headline corporate tax rates are in line with the median of other SSA countries. Average trade tax rates and especially average personal income tax rates are much higher than those of other SSA countries. While Ethiopia does stand out in having relatively low minimum capital requirements to qualify for CIT holidays, low statutory withholding rates on royalties, dividends and interest income, and a large number of double tax treaties which further reduce these withholding rates, the overall effect of these choices on the tax-to-GDP ratio is likely small. In total, 2.1 percentage points of the gap are attributed to policy factors.

After accounting for structural factors and policy factors, we are left with 1.2 percentage points out of the 5.5 percentage point gap in tax-to-GDP ratios between Ethiopia and other SSA countries. We attribute this to 'compliance-related factors', and the estimates across tax types suggest that these are especially important for direct tax and VAT collection. However, it is worth noting that there are other potential explanations for this gap apart from weak compliance. Policy choices not considered in this report, such as ad-hoc or undocumented exemptions, may be more prevalent in Ethiopia than in other countries. Policy differences whose costs we have not been able to quantify – such as low minimum capital requirements for CIT holidays, low withholding rates and a large number of tax treaties – may actually be quite costly. Our prediction of the tax-to-GDP ratio is based on structural factors – such as the composition of the economy and demographics – for which data are available over a large number of countries. This may not fully capture all structural factors that are relevant for the tax-to-GDP ratio.

If all 1.2 percentage points can be explained by weak compliance, this raises the question 'Why is compliance so weak?'. We have already controlled for the possibility that the composition of Ethiopia's economy, its demographics and other structural factors contribute to weak compliance, though there may be other structural factors that we have overlooked. One explanation is that the quality of tax administration is weaker in Ethiopia than in other countries. This report does not undertake a detailed assessment of tax administration in Ethiopia. However, a 'TADAT' assessment conducted by the IMF in 2016 (Muyangwa et al., 2016) gave Ethiopia the lowest possible score on the quality of its tax administration at the time (a grade 'D'). The report criticised the high reliance on manual operations, the poor quality of IT and taxpayer data, and weak compliance risk management. This does not necessarily mean that tax administration in Ethiopia is worse than in other sub-Saharan African countries: more than half of SSA countries where a

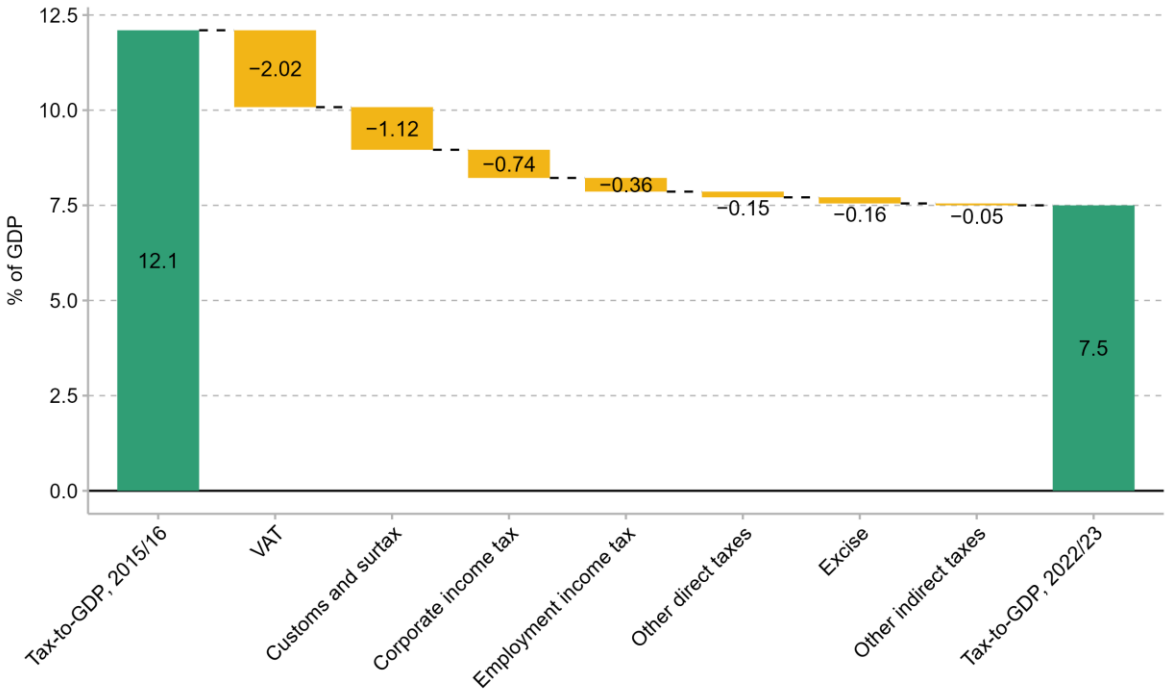
TADAT assessment was conducted also received a grade 'D' (Acedo et al., 2022).[20] An updated TADAT assessment would provide up-to-date information on Ethiopia's tax administration, and changes since 2016. A report by the Policy Studies Institute (Yeshineh, Gebrewolde and Alamerie, 2023) on the tax-to-GDP ratio has also pointed to numerous issues with tax administration, such as an excessive focus on nominal targets, weak coordination between federal and regional tax authorities, and lack of digitalisation.

[20] Few individual TADAT reports are published. The only other East African country that has a publicly available TADAT report is Uganda, which received between a B and a C overall (Okello et al., 2019).

4. Tax-by-tax analysis of Ethiopia's tax-to-GDP ratio performance over time

The previous two chapters were able to account for a large part in the difference in the level of the tax-to-GDP ratio in Ethiopia and other sub-Saharan African countries. This chapter turns to the next question: 'Why has Ethiopia's tax-to-GDP ratio fallen so much in recent years?'.

Figure 4.1. Breakdown of fall in tax-to-GDP by tax instrument between 2015/16 and 2022/23



Note: VAT on imports and excise on imports are included under VAT and excise respectively. The social welfare levy is included within surtax. 'Other direct taxes' refers to taxes on rental incomes, dividends, capital gains, royalties, withholding taxes on imports, interest income taxes, agricultural income tax, urban/rural land value tax and personal business income tax. 'Employment income tax' refers to both federal and regional employment income tax. 'Other indirect taxes' refers to turnover tax and stamp duty.

Source: Authors' calculations using Ministry of Revenue official revenue reports.

Between 2014/15 and 2022/23, the tax-to-GDP ratio fell by 4.9 percentage points (pp). Due to the availability of data, the analysis in this chapter focuses largely on the fall in the tax-to-GDP ratio in the period since 2015/16, during which the tax-to-GDP ratio fell by 4.6pp. The largest

contributor to this fall was VAT (which includes VAT on imports), for which revenues fell by 2.02pp as a share of GDP. This was followed by customs duty and surtax revenues, which fell by 1.12pp of GDP, corporate income tax revenues, which fell by 0.74pp of GDP, and (federal and regional) employment income tax revenues, which fell by 0.36pp of GDP, as shown in Figure 4.1.

These four tax types are examined in turn in Sections 4.1, 4.2, 4.2 and 4.4 respectively. Together, they account for 92% of the decline in the tax-to-GDP ratio between 2015/16 and 2022/23 (and 75% of all tax revenues in 2022/23). The fall in other direct taxes, excise taxes and other indirect taxes is not considered in this report, due to their small contribution to the fall in the overall tax-to-GDP ratio. For each of the other tax instruments, we aim to quantify the relative importance of structural factors (changes in the structure of the Ethiopian economy that make it harder to raise tax revenue), policy factors and compliance-related factors.

The allocation of the fall in the tax-to-GDP ratio into these three factors is not an exact science. This is because distinguishing between them is sometimes difficult, for conceptual and/or data-related issues. The assumptions underlying our choices in these instances are discussed in detail in the relevant sections.

4.1 VAT

Key findings

1. VAT, excluding refunds, fell from 4.4% of GDP in 2015/16 to 2.4% in 2022/23, which accounts for 44% of the overall decline in Ethiopia's tax-to-GDP ratio.

2. Among Ethiopia's distinct VAT administrative systems, the biggest fall took place in VAT withholding. In Ethiopia, VAT withholding revenue arises from government and state-owned enterprises withholding VAT due on their domestic purchases. A large portion of the fall in VAT withholding reflects the fall in public sector investment over this period.

3. VAT withholding appears to have been important in ensuring compliance amongst suppliers to the public sector. As public sector investment fell, it appears that suppliers did not respond by paying more VAT themselves. Around 0.6 percentage points of the fall in the VAT-to-GDP ratio can be attributed to the fall in public sector investment leading to a fall in compliance. We classify this as a 'structural factor', as it reflects macroeconomic changes that are beyond the direct control of tax authorities.

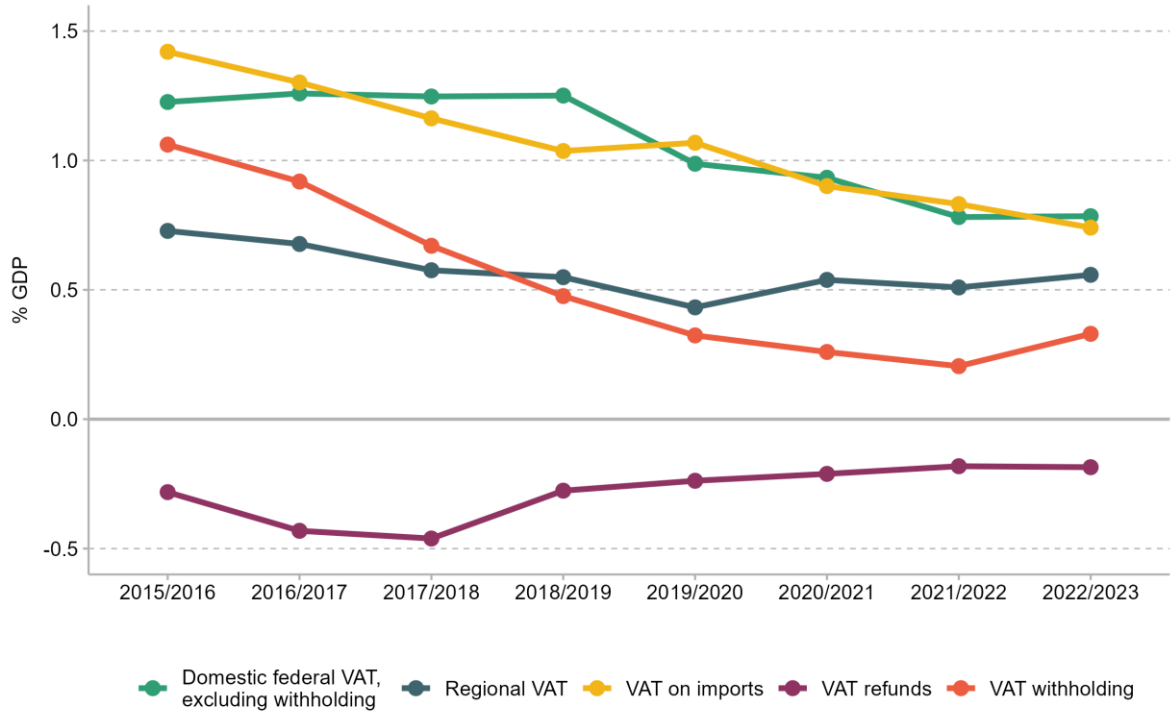
4. Relatively little of the fall in the VAT-to-GDP ratio can be attributed to policy changes. The only new VAT exemptions introduced over the period were the temporary VAT exemptions for eggs, some vegetable oils, pasta, baby food and sugar in 2020. The cost of these is estimated to be less than 0.1 percentage points of GDP.

5. The remaining 1.4 percentage points is attributed to 'compliance-related factors'. Non-compliance appears to have increased, above and beyond that which can be explained by the growth of sectors that had low compliance to begin with, or by the fall in public investment. A large portion of this is increased non-compliance appears to be in the wholesale/retail sector.

VAT collection in Ethiopia is organised as five separate – but interlinked – administrative systems. By order of size as of 2022/23, these are: domestic federal VAT (0.8% of GDP); import VAT (0.7% of GDP); regional VAT (0.6% of GDP); VAT withholding (0.3% of GDP); and VAT refunds (–0.2% of GDP). Each system has followed a different revenue trend between 2015/16 and 2022/23, as shown in Figure 4.2.

The largest single contributor to the decline in VAT revenues between 2015/16 and 2022/23 was VAT withholding revenue, which is the VAT withheld and directly remitted by the government and state-owned enterprises on their purchases of goods and services subject to VAT. This declined by 0.73pp from 1.1% of GDP in 2015/16. The next subsection shows that this was largely driven by a fall in public sector investment, but that there *may* also be a growing compliance issue for one major public sector entity.

Figure 4.2. VAT revenues by administrative system



Note: VAT refunds only include federal VAT refunds.

Source: Ministry of Revenue aggregate revenue data.

The next-largest contributor to the decline in VAT revenues was import VAT collected by the Ethiopian Customs Commission, which declined by 0.68pp from 1.4% of GDP in 2015/16. This halving of import VAT is strongly linked to the fall in goods imports over the same period, which is discussed in Section 4.2. Here it is worth noting that a fall in imports and import VAT revenues does not necessarily translate into a fall in overall VAT revenues. This is because, for a given level of GDP and consumption, lower import VAT revenues will, all else equal, be offset by higher domestic VAT revenues as more purchases of VATable goods and services are sourced domestically. Overall VAT revenues may change if VAT policy or compliance differs systematically between imports and domestically produced goods and services, or if the decline in imports is associated with changes in the demand for different goods and services (e.g. consumption versus business investment or VATable versus non-VATable items). Internationally, there is strong evidence that compliance with VAT is higher for imports than for domestic

production (Morrow, Smart and Swistak, 2022). Plausibly, the fall in imports has therefore contributed to a reduction in overall VAT compliance and hence revenues in Ethiopia, but the data available to us do not allow us to formally test this.

The third-largest contributor to the decline in VAT revenues between 2015/16 and 2022/23 was domestic federal VAT, excluding receipts from VAT withholding. The federal government collects VAT from federally-owned state-owned enterprises and incorporated private enterprises. Revenue from this administrative system was relatively stable at 1.2–1.3% of GDP between 2015/16 and 2018/19, but subsequently fell by approximately 0.5pp of GDP. In a later subsection, we show that this is partly because of large falls in tax paid by the telecommunications and manufacturing sectors.

Figure 4.2 also shows that regional VAT revenues – which are collected from regionally-owned state-owned enterprises and unincorporated private enterprises – have fallen by around 0.2pp of GDP from 0.7% of GDP in 2015/16. A lack of administrative microdata means that we are unable to look in detail at the factors driving this fall, although it is relatively modest in the context of the overall fall in VAT revenues.

Finally, VAT refunds – which can be generated when a taxpayer's input VAT credits are consistently higher than the VAT they charge on their output – have fallen (after peaking in 2017/18). Unless otherwise specified, the tax-to-GDP ratio in this section (and this report more generally) is based on gross VAT revenues (before the payment of VAT refunds), in line with the Ethiopian government's reporting. When VAT refunds are netted out, the level of the tax-to-GDP ratio is slightly lower and the decline in the tax-to-GDP ratio is slightly smaller.[21]

The rest of this section proceeds as follows. As discussed, we begin with a detailed examination of VAT withholding revenues, before moving on to examine other domestic federal VAT revenues. We then undertake a VAT gap analysis which considers the VAT system as a whole, allowing for interactions between the different systems (including import VAT and the various forms of domestic VAT). We conclude by using the findings of these three analyses to estimate

[21] The tax-to-GDP ratio net of VAT refunds was 7.3% in 2022/23, compared with 7.5% gross of VAT refunds. The decline in the net tax-to-GDP ratio was 4.5 percentage points between 2015/16 and 2022/23, compared with a decline in the gross tax-to-GDP ratio of 4.6 percentage points. Since 2018/19, the federal government's policy has been to reserve 10% of gross federal VAT revenue (including VAT on imports) for VAT refunds. As a result of this rule, the decline in VAT refunds since 2018/19 is a mechanical consequence of the decline in gross federal VAT revenue. In 2016/17 and 2017/18, the refund ratio was higher at 12% and 15% of gross federal VAT revenue respectively. VAT refunds for regional VAT filers are managed by the respective regional revenue bureaus. We do not know the exact amount of VAT refunded by the regional governments, but we have been informed that their refund ratio is lower than that of the federal government.

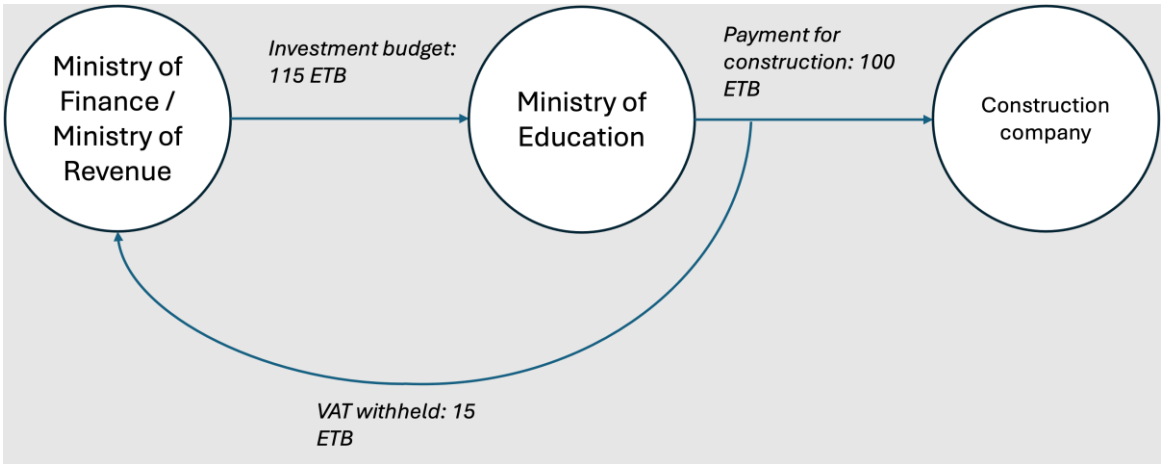
the contribution of structural factors, policy factors and compliance-related factors to the overall fall in the VAT-to-GDP ratio.

VAT withholding

The purpose of VAT withholding is to improve VAT compliance. In a standard VAT transaction between a buyer and a seller, the seller is responsible for remitting the VAT paid on that transaction to the tax authority. VAT withholding requires designated VAT withholding agents to remit the VAT payable on their purchases as well, thus transferring the liability from the seller to the buyer. The assumption behind VAT withholding is that VAT withholding agents are more likely to be compliant than their suppliers.

In Ethiopia, all federal or regional budgetary institutions and state-owned enterprises – which this report collectively refers to as the public sector – are VAT withholding agents. Unlike in many other countries, large private sector firms are not designated as VAT withholding agents.

Figure 4.3. Example transaction involving VAT withholding



To make it clear how VAT withholding works in Ethiopia, consider the example transaction in Figure 4.3. In this example, the Ministry of Finance allocates 115 ETB to the Ministry of Education for a school construction project. The Ministry of Education then hires a construction company to build the school. The value of the construction services is 100 ETB and the VAT charged on it is 15 ETB. The Ministry of Education is exempt from VAT, but it is a designated VAT withholding agent, which means that it withholds and then remits the 15 ETB of VAT paid on its purchase of construction services to the Ministry of Revenue.

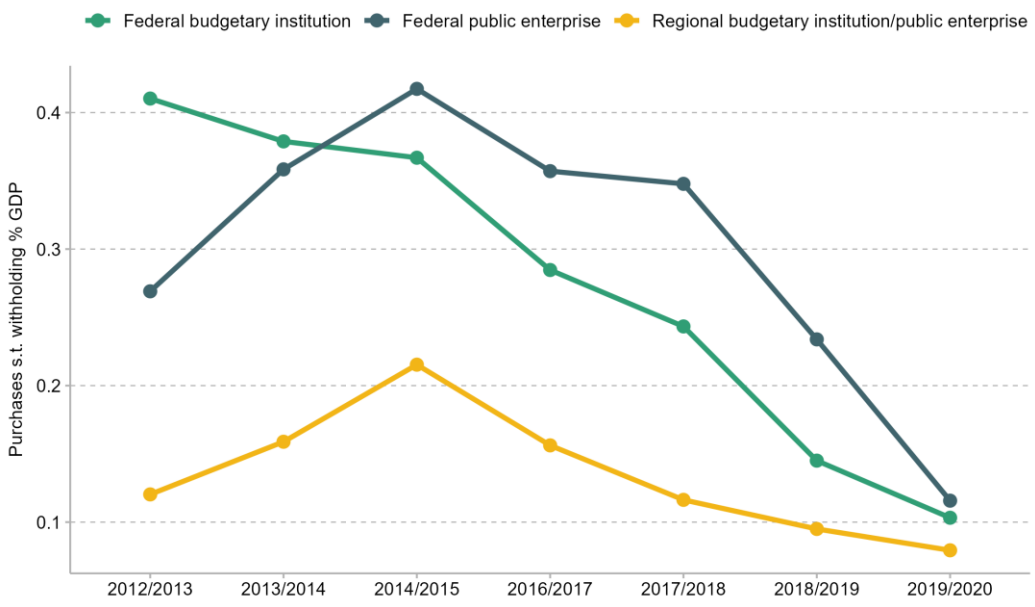
From this diagram, it is clear to see how public sector spending generates VAT withholding revenue.[22] It is also clear that the 15 ETB of VAT due on the purchase of construction services both increases government spending by the Ministry of Education and increases VAT revenues, via the VAT withheld by the Ministry of Education: the net impact of the VAT element of this transaction is therefore fiscally neutral for the government. However, VAT withholding can still play an important revenue-raising role. If there was no VAT withholding, the construction company would be responsible for paying the 15 ETB of VAT on this transaction to the Ministry of Revenue, but it may choose not to fully do so. Assuming that the Ministry of Education correctly withholds, reports and remits the withheld VAT to the Ministry of Revenue, VAT withholding would therefore increase VAT revenue and the fiscal balance. However, VAT withholding does not automatically guarantee improved compliance if private sector compliance was high to begin with, or if public sector organisations such as the Ministry of Education do not report or remit withheld VAT appropriately.

Figure 4.4 disaggregates the decline in VAT withholding by category of withholding agent. Federal budgetary institutions refer to ministries and other entities whose budgets are directly allocated by the federal government. According to publicly available budgetary documents, the Ethiopian Roads Authority's capital expenditure budget declines substantially over the period, which likely explains a significant portion of the decline in VAT withholding by federal budgetary institutions. Federal public enterprises refer to state-owned enterprises under federal ownership. Major examples include Ethiopian Airlines, Ethiopian Electric Power, and the Ethiopian Railways Corporation.

The public sector mostly withholds VAT from the construction sector. In 2019/20 (the earliest year for which such a breakdown is available), 70% of withholding credits are claimed by firms in the construction sector, 11% are claimed by firms in the wholesale trade sector and 8% are claimed by firms in the manufacturing sector.

[22] The set-up is slightly different for state-owned enterprises (SOEs), as the government generally does not give funds directly to SOEs. Instead, SOEs can borrow and have the borrowing implicitly or explicitly guaranteed by the government. Around 50% of VAT withholding revenue is remitted by state-owned enterprises.

Figure 4.4. VAT withholding by the category of withholding agent



Source: Ministry of Revenue VAT withholding declaration data.

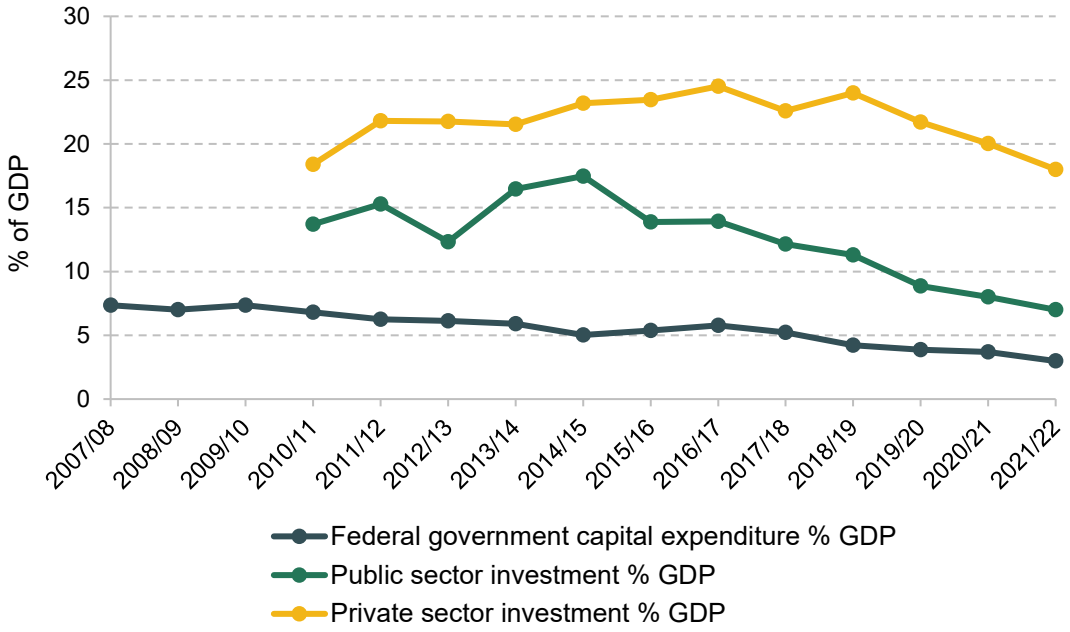
As all VAT withholding agents are in the public sector, trends in VAT withholding revenues closely track trends in public sector expenditure. Public sector investment (as opposed to recurrent expenditure) is particularly relevant for VAT withholding, as a much larger proportion of recurrent expenditure is not subject to VAT withholding.[23] As explained in Box 4.1, after increasing during the first half of the 2010s, Ethiopian public sector investment fell substantially from 2014/15 onwards.

Box 4.1. The public sector investment boom-and-bust in Ethiopia

Ethiopia has explicitly followed a development model based on high public sector investment. The two Growth and Transformation Plans (GTPI and GTPII, published in 2010 and 2016) heavily emphasised public sector investment in infrastructure (World Bank, 2022a).

[23] For the federal government, the main components of recurrent expenditure (excluding debt interest payments) are defence, justice, security, education and general services. In both 2015/16 and 2022/23, these categories accounted for around 80% of federal recurrent expenditure (excluding debt interest payments). Within these categories, a major cost is likely to be the wage bill, which is not subject to VAT withholding. Recurrent expenditure for state-owned enterprises (which are considered part of the broader public sector) may be more likely to be subject to VAT withholding.

Figure 4.5. Federal government capital expenditure, public sector investment and private sector investment as a % of GDP



Note: Federal government capital expenditure % GDP is available at the fiscal-year level. Public sector investment % GDP is at the calendar-year level and is shown for the FY ending in that year. Public sector investment % GDP is not available before 2011. The public sector also includes expenditures by regional government and state-owned enterprises. Public sector investment is calculated by subtracting private sector gross fixed capital formation from total gross fixed capital formation, both from World Bank data. For other national accounts series, the World Bank reports values for FY 2014/15 as being for 2015. We assume this is also the case for private and total gross fixed capital formation.

Source: Federal government capital expenditure – Ministry of Finance budget documentation, available online at: https://www.mofed.gov.et/resources/budget/. Public sector investment – World Bank (2023b).

Public sector investment peaked at 17.5% of GDP in 2014/15,[24,25] as Figure 4.5 shows. Investment projects ranged from large 'megaprojects', such as the Grand Ethiopian Renaissance Dam,[26] the Addis–Djibouti railway[27] and the Addis Light Metro, to numerous smaller energy, irrigation, road construction and housing development projects. Public sector investment was associated with large imports of capital goods and growth in the construction and manufacturing industries (World Bank, 2022a; Dutu, Sennoga

[24] Public sector investment is calculated by subtracting private sector gross fixed capital formation from total gross fixed capital formation, both from World Bank data. For other national accounts data, the World Bank reports values for FY 2014/15 as being for 2015. We assume this is also the case for private and total gross fixed capital formation.

[25] The IMF separately reports private sector investment in its Investment and Capital Stock Dataset (https://data.imf.org/?sk=1ce8a55f-cfa7-4bc0-bce2-256ee65ac0e4). Implied public sector investment (total gross fixed capital formation minus private sector investment) follows a similar trend but has a higher level. Implied public sector investment based on the IMF database was 28.9% of GDP in 2013/14, before falling to 11.5% of GDP in 2019/20. Data are not available for after 2019/20.

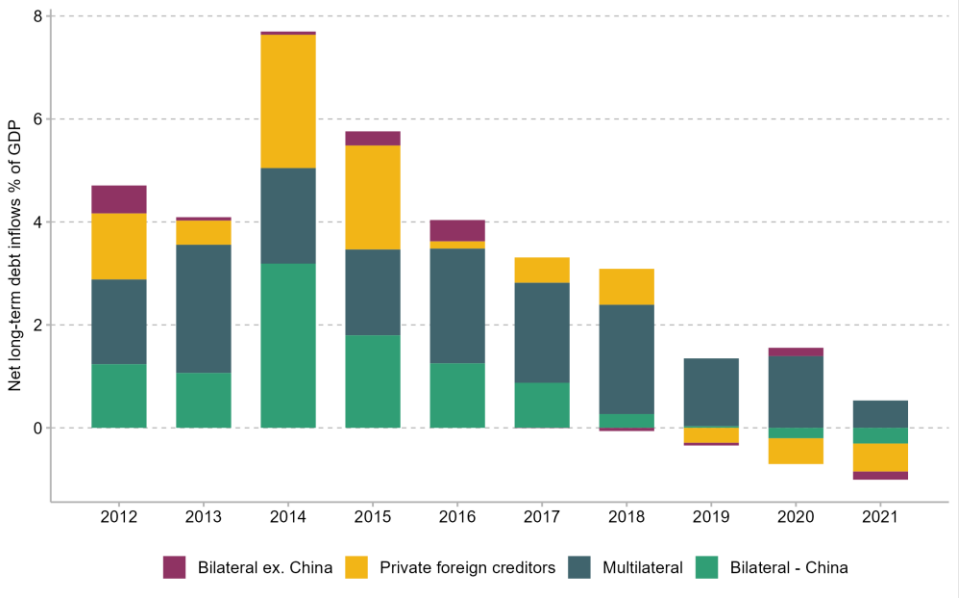
[26] This dam has been reported to cost $5 billion USD (https://www.fdiintelligence.com/content/feature/the-grand-ethiopian-renaissance-dam-stirs-controversy-in-east-africa-82789), which is equivalent to 16% of Ethiopia's GDP at the time construction began in 2011.

[27] The Ethiopian section of the line has been reported to cost $3.4 billion USD (https://www.railway-technology.com/projects/ethiopia-djibouti-railway-line-modernisation/?cf-view), which is equivalent to 11% of Ethiopia's GDP at the time construction began in 2011.

and Mpuga, 2023). In 2014/15, Ethiopia had one of the highest levels of public sector investment in the world. However, it has since fallen to just 7.0% of GDP in 2021/22. Federal government capital expenditure – which excludes investment by state-owned enterprises or regional governments – has also fallen, from 5.8% in 2016/17 to 3.0% in 2021/22.[28]

The high levels of public sector investment in the mid-2010s were facilitated by high levels of external borrowing. Figure 4.6 shows that net external borrowing by Ethiopia peaked at 7.7% of GDP in 2014, fell to 5.5% in 2015 and then to –0.5% of GDP in 2021. External borrowing has been almost entirely driven by the public sector: between 2012 and 2022, on average 95% of the stock of external debt was owed by the public sector (World Bank, 2023a). In 2014, the biggest lenders were China, which lent Ethiopia the equivalent of 3.2% of GDP, and private creditors, which lent Ethiopia the equivalent of 2.6% of GDP. External borrowing from China and private foreign creditors has all but disappeared, and borrowing from multilaterals has fallen substantially. Private sector investment was likely further constrained by reductions in official development assistance as a percentage of GDP, and rising debt service costs as a percentage of GDP.

Figure 4.6. Net external borrowing by Ethiopia by creditor type



Note: Does not include short-term debt inflows or non-debt inflows. 'Private foreign creditors' is assumed to be the gap between total long-term inflows, and the sum of net lending by multilateral organisations and bilateral lending.

Source: World Bank, 2023a.

[28] Recurrent expenditure has remained stable. In both 2015/16 and 2022/23, federal government recurrent expenditure (excluding debt interest payments) was 2.5% of GDP.

Private sector investment has also fallen as a share of GDP, but not by as much as public sector investment. As a result, the share of public sector investment in total investment fell from 43% in 2014/15 to 28% in 2021/22.

The fall in public sector investment is a key factor in explaining the reduction in VAT withholding revenues. However, the fall in VAT withholding revenues between 2014/15 and 2021/22 (84%, from 1.2% to 0.2% of GDP) substantially exceeds the fall in public sector investment (60% from 17.5% to 7.0% of GDP) over the same period. If all public sector investment was subject to VAT withholding, and only public sector investment was subject to VAT withholding, the fall in public sector investment would therefore explain 70% (equal to 60% / 84%) of the overall fall in VAT withholding revenue over the period.

The fact that VAT withholding fell more than public sector investment could reflect a reduction in the use of external suppliers subject to withholding in remaining public sector investment; (larger) falls in non-investment spending subject to withholding; a potential fall in compliance by withholding agents; or reforms to VAT withholding policy. We briefly consider VAT withholding policy in more detail.

VAT withholding policy

VAT withholding policy was reformed in August 2019 (Proclamation No. 1157/2019). Prior to the reform, VAT withholding agents were obligated to withhold 100% of the VAT payable on their purchases. This created a risk of 'over-withholding': private sector firms that sell to the public sector could be left in a refund position due to having input VAT credits but no output VAT (Azulai et al., 2019). The reform reduced the withholding rate from 100% to 50%. Mechanically, this should have reduced VAT withholding revenues by 50%.

However, it appears that the policy has not been fully implemented. Figure B.4 in Appendix B shows that many private sector firms continue to report being withheld at 100%. A rough estimate is that at least 30% of VAT withholding credits are claimed by firms that continue to be withheld at the 100% rate as of 2022.[29] When accounting for this partial implementation of the policy, the policy can be expected to have led to a 0.12pp reduction in VAT withholding revenues as a

[29] See notes under Figure B.4 for details on the calculation.

percentage of GDP,[30] though some of this should have been recouped elsewhere in the VAT system, specifically through lower VAT refunds and increased VAT paid by private firms.

How does VAT withholding affect the rest of the VAT system?

VAT withholding is highly interlinked with Ethiopia's other VAT systems, even though it is administered separately. If suppliers to the public sector were perfectly compliant, VAT withholding would have no effect on the overall level of domestic VAT collection. As the private sector shifts away from selling to the public sector, it would be expected that VAT revenue excluding VAT withholding would increase.[31]

However, non-withholding VAT revenue might well rise by less than the fall in VAT withholding. One reason is that in contrast to much of public sector investment, VAT payable on private sector investment is typically deductible from the investing firm's output VAT, so unless the investing firm's output changes, higher private sector investment might not yield any extra VAT revenue in the short run (in the long run, we would expect the firm's output to rise as a result of the investment). Another reason, discussed above, is that compliance in the private sector is likely to be lower. The VAT gap analysis conducted later in this section finds that VAT withholding was important in supporting compliance, especially in the construction sector.

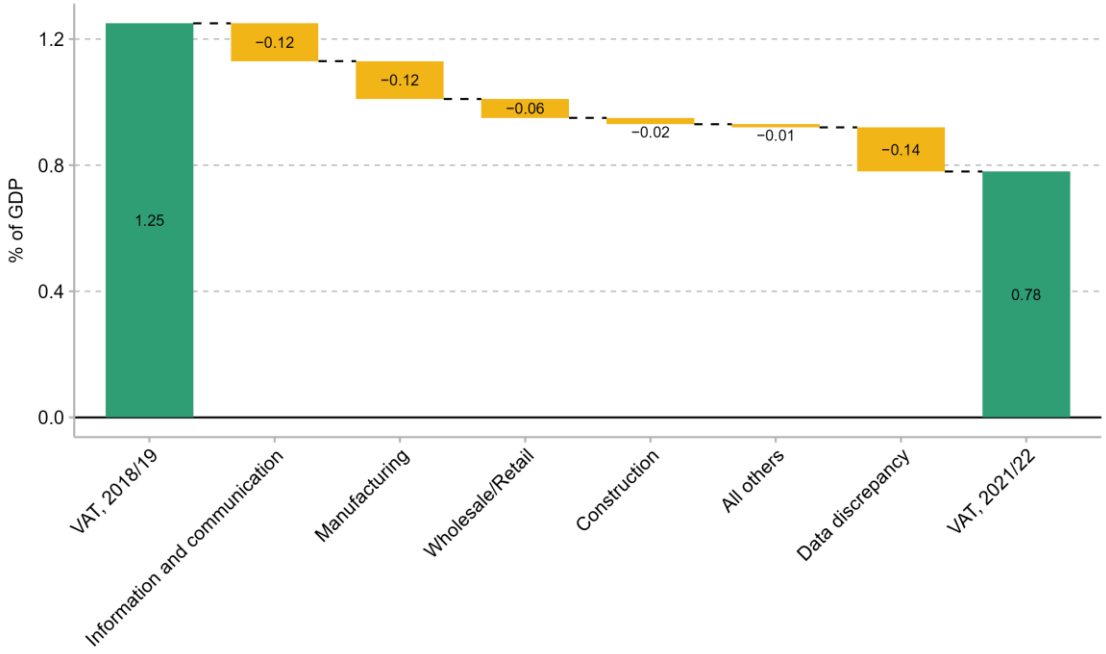
Domestic federally collected VAT

As discussed above, domestic federal VAT was broadly stable at 1.2–1.3% of GDP between 2015/16 and 2018/19, before falling. Thus, while data issues with pre-2018/19 administrative microdata prevent a detailed taxpayer- and sector-level analysis of revenue trends for the years 2015/16 and 2018/19, they do allow us to examine the period of falling revenue. This is done in Figure 4.7, which breaks down the fall in revenues between 2018/19 and 2021/22.

[30] In 2019/20, VAT withholding was 0.32% of GDP. In 2020/21, it was 0.26% of GDP. Following the reform, 30% of VAT withholding credits are estimated to be claimed by firms that are still subject to the 100% withholding rate, or 0.08% of GDP in 2020/21. We assume that withholding credits for these firms are also 0.08% of GDP in 2019/20. Therefore, the reform only applies to withholding credits not claimed by firms, which are 0.24% of GDP in 2019/20. Reducing this by 50% yields the 0.12pp of GDP revenue estimate.

[31] The change in the withholding rate from 100% to 50% also ought to have increased non-withholding domestic VAT.

Figure 4.7. Breakdown of the fall in domestic federally collected VAT by sector, 2018/19 to 2021/22



Note: Sectors are based on ESIC Activity Codes. Data discrepancy refers to the component of the fall that cannot be explained, due to differences in VAT as a percentage of GDP from the microdata and officially reported statistics.

Source: VAT 2018/19 and VAT 2021/22 are from Ministry of Revenue official revenue statistics. The components of the fall are from Ministry of Revenue tax payment data.

The joint largest contributor to the fall in VAT-to-GDP revenues was the information and communication sector. The liberalisation of the telecommunications sector in Ethiopia may explain some of this decline. Ethio Telecom used to be the monopoly telecommunications provider in Ethiopia. In May 2020, the government announced that it would award an additional telecoms operator licence, which was awarded to Safaricom in May 2021. The threat of competition moved Ethio Telecom to halve tariffs and build additional towers (Rynn, 2023). Internet blackouts in certain regions linked to conflict may have also been detrimental for Ethio Telecom. The manufacturing sector, construction, and wholesale/retail also saw large declines in VAT collection relative to GDP.

Unfortunately, 0.14 percentage points of the difference in the VAT-to-GDP ratio between 2018/19 and 2021/22 cannot be attributed to any particular business or industry due to discrepancies in total VAT collections reported in the microdata and in official statistics. In particular, as the coverage and quality of microdata have improved, the gap between revenue reported in the microdata and in official statistics has narrowed, in turn meaning the fall in revenues captured by microdata is smaller than the full fall captured by official statistics.

VAT gap analysis

While the analysis by administrative system (withholding and other domestic federal VAT) undertaken so far is informative, it cannot properly capture the interactions between different parts of the VAT system, or the impact of changes in economic structure. For example, a fall in VAT revenue from one administrative system may be offset by an increase in revenue from other systems, and a fall in VAT revenue from a particular sector is less of a concern if that sector has become smaller relative to GDP. To better understand how much of the decline in the VAT-to-GDP ratio is due to structural, policy and compliance-related factors, we turn to VAT gap analysis.

The purpose of a VAT gap analysis is to estimate the VAT gap, or the difference between actual VAT collections and potential VAT under an idealised ('comprehensive') policy structure, and to break it down into a compliance gap and a policy gap (Hutton, 2017). The policy gap can then be broken down further into an 'expenditure gap' and a 'non-taxable gap'.

We follow the IMF's RA-GAP methodology (Hutton, 2017), which was previously implemented by the IMF in Ethiopia for the period 2012/13 to 2017/18 (Hutton et al., 2019). We make some modifications to the IMF's model, which are discussed in more detail in Appendix D.[32] In this methodology, the compliance, expenditure and non-taxable gaps are defined as follows:

- The *compliance gap* is the difference between what is actually collected and what would have been collected under full compliance given the *current* policy structure. It can arise, as the name suggests, from non-compliance by firms, but also from the tax administration implementing policy in a way that differs from that set out in VAT law.
- The *expenditure gap* is the difference between expected VAT revenues under full compliance given the current policy structure and expected VAT revenues under full compliance with a 'normative' policy structure that would only exempt specific activities that are very difficult or impossible to tax in practice.[33] Although fuel is officially subject to VAT in Ethiopia, it was not collected until very recently, so it is treated as exempt in the VAT gap model.
- The *non-taxable gap* is the difference between expected VAT revenues under full compliance with the normative policy structure and expected VAT revenues under full compliance if all

[32] The most important difference is that the IMF derives relationships between sectors from the 2010/11 supply and use tables, whereas this analysis uses the 2015/16 Social Accounting Matrix produced by Mengistu et al. (2019). Apart from being a more up-to-date representation of the economy, the 2015/16 Social Accounting Matrix also allows for the identification of agricultural production that is self-consumed. The other main differences are that we allocate VAT revenues to each sector differently, which is made possible by higher-quality tax microdata. We also make some changes to the model and policy structure based on our understanding of tax policy in Ethiopia. Appendix D goes into further detail on this.

[33] In this model, the commodities that are non-taxable under the normative tax structure are finance, housing, public administration, public healthcare, public education, and religious services. International air transport is zero-rated as part of the normative tax structure. There is debate (Adam et al., 2011, chapters 7 and 8) as to whether all of these commodities should be considered as non-taxable. The VAT registration threshold is also included in the normative tax structure.

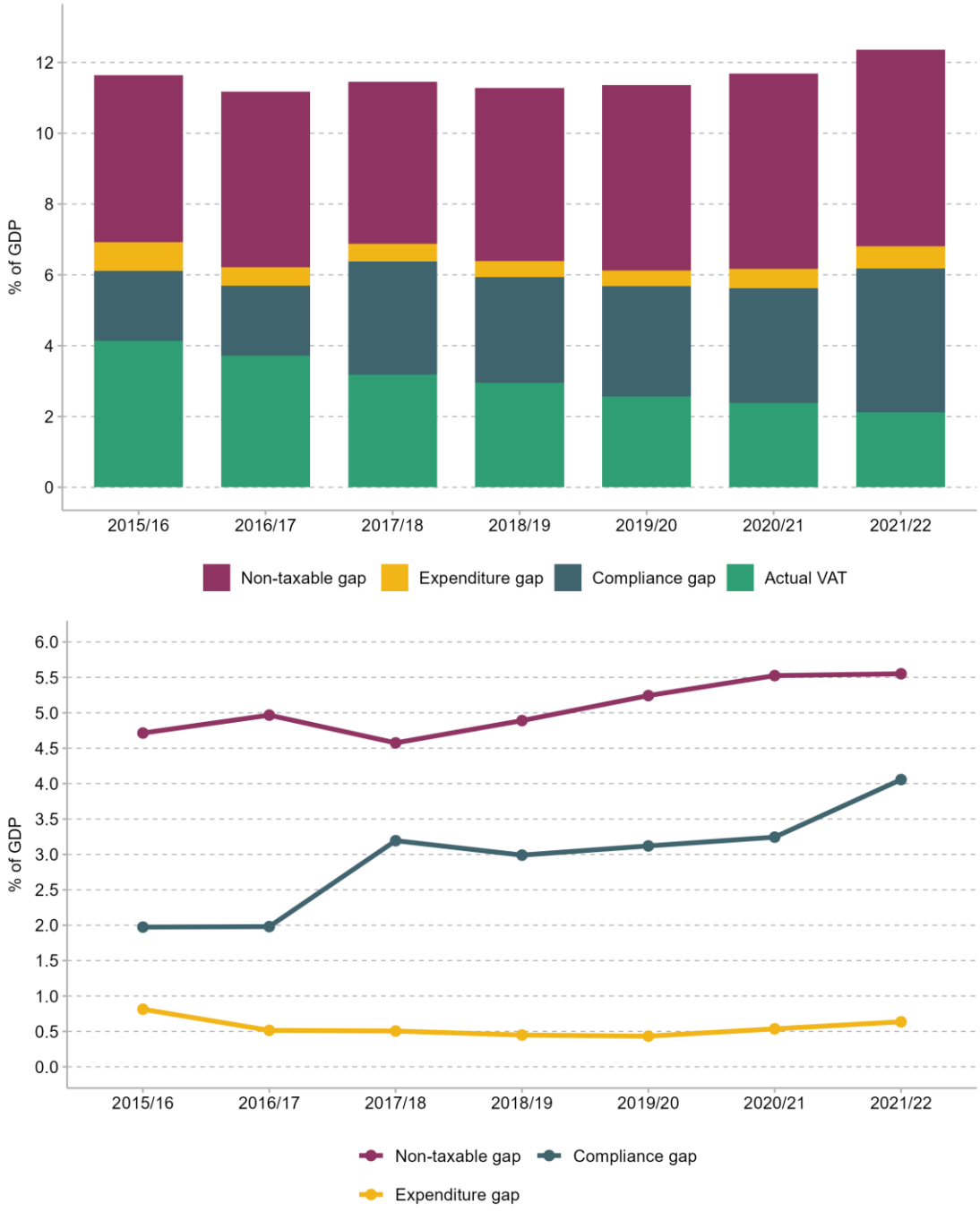
consumption (and investment by government and households) was taxed at the standard rate. In Ethiopia, by far the largest contributor to the non-taxable gap is agricultural production by households.

The VAT gap methodology defines revenue to be net of VAT refunds. As we do not have VAT microdata for 2022/23, the VAT gap analysis is only carried out between 2015/16 and 2021/22. VAT net of refunds fell from 4.2% of GDP in 2015/16 to 2.1% of GDP in 2021/22. VAT gross of refunds – which is the measure used in official revenue reports – fell from 4.4% of GDP in 2015/16 to 2.3% of GDP in 2021/22, though rose slightly to 2.4% of GDP in 2022/23.

Figure 4.8 presents our estimates of Ethiopia's VAT gap. The top panel shows actual VAT collections, the compliance gap, the expenditure gap and the non-taxable gap. The sum of all these components is potential VAT, which increased from 11.6% in 2015/16 to 12.4% in 2021/22, driven by an increase in consumption as a share of GDP. The overall VAT gap (the sum of the compliance, expenditure and non-taxable gaps) increased from 7.5% to 10.2% of GDP over this period as VAT revenues declined.

The non-taxable gap is the largest component of Ethiopia's VAT gap, and it increased from 4.7% of GDP in 2015/16 to 5.6% of GDP in 2021/22. It is followed by the compliance gap, which increased from 2.0% of GDP to 4.1% of GDP over the same period. The expenditure gap is small relative to the other two components. It was 0.8% of GDP in 2015/16, fell to 0.4% of GDP in 2019/20 and increased to 0.6% of GDP in 2021/22.

Figure 4.8. VAT and the overall VAT gap



Note: See Appendix D for methodology.

Source: Authors' calculations based on IMF VAT gap methodology (Hutton et al., 2019), tax administrative data from the Ministry of Revenue, national accounts from the Ministry of Planning and Economic Development, and the 2015/16 Social Accounting Matrix from Mengistu et al. (2019).

Ethiopia's relatively large non-taxable gap and relatively small expenditure gap are a result of its agricultural sector. The vast majority of domestic output for certain agricultural commodities is produced by households: for example, 99% of teff, 98% of cattle, 97% of milk and 95% of maize produced in Ethiopia are produced by households according to the Social Accounting Matrix from Mengistu et al. (2019). Household production is itself comprised of two parts: production for own consumption (subsistence, or non-monetised consumption) and production for the market. Subsistence agriculture is classified as non-taxable by VAT, and household production for the market is assumed to be non-taxable as household producers are likely below the VAT registration threshold. The expenditure gap is therefore small as removing VAT exemptions for food would only affect the small proportion of agricultural output produced by non-households and because there are relatively few non-food VAT exemptions.

The expenditure gap is smaller than reported by previous IMF work. Hutton et al. (2019) estimate the expenditure gap to be around 1% of GDP between 2012/13 and 2017/18, and Grote et al. (2019) estimate the cost of solely food exemptions to be 1.25% of GDP. The latter do not provide methodology for their calculation, but Appendix D goes into substantial detail of the differences between our study and Hutton et al. (2019). The key difference is that Hutton et al. estimate that Ethiopia has a much smaller agricultural sector and do not take into account the high production of exempt commodities by households.

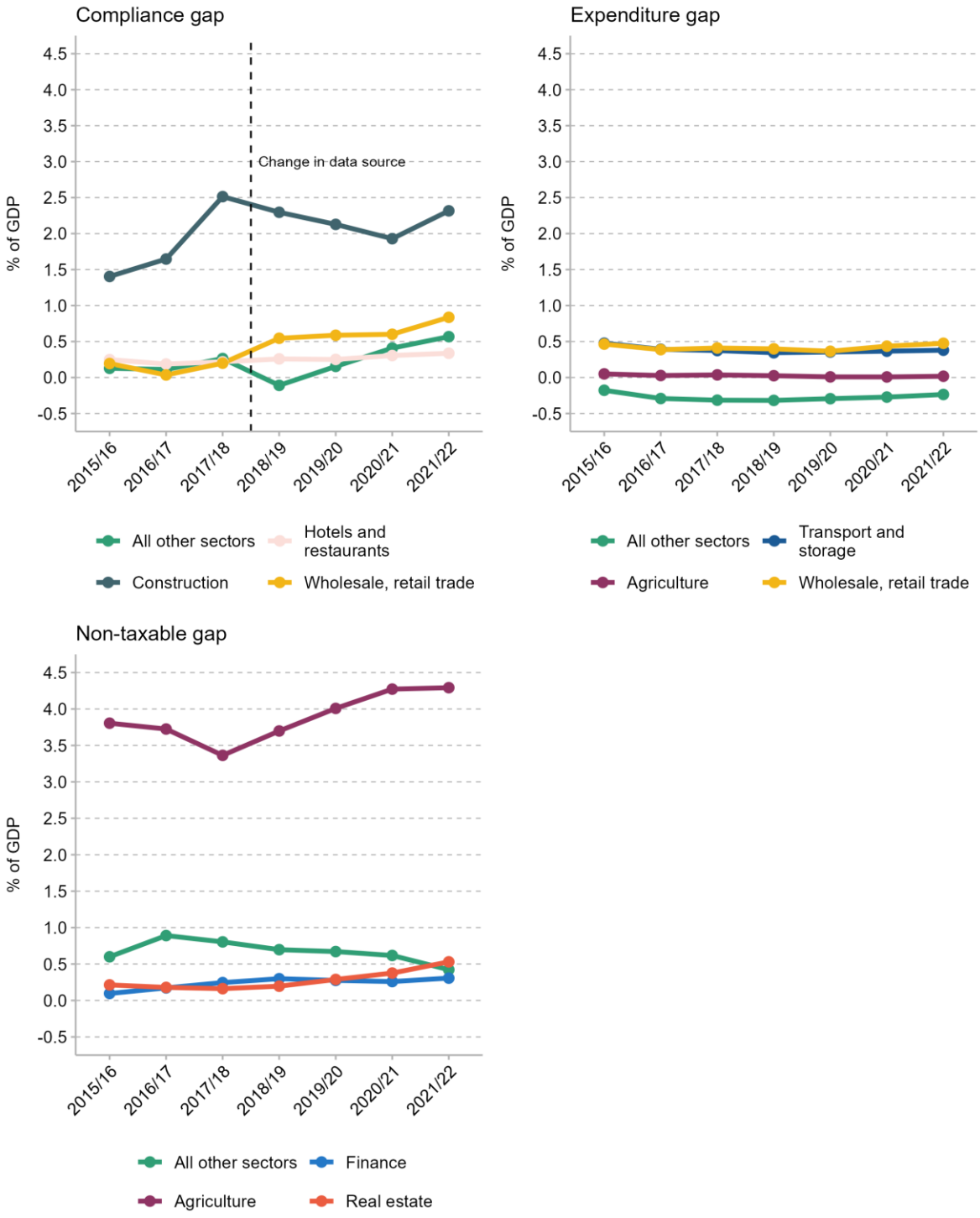
Sector-level VAT gaps

To better understand what has driven the overall change in the VAT gap, we break down the VAT gap by sector. An important caveat with sectoral VAT gaps is that they require VAT revenue to be allocated to each sector. This is relatively straightforward for domestic federal VAT, as the microdata contain sectoral identifiers for most firms, but is more complex for Ethiopia's other VAT systems (VAT withholding, VAT refunds, regional VAT and import VAT). Appendix D goes into more detail on how VAT revenue is allocated to sectors. Another important caveat is that the data source for domestic federal VAT changes between 2017/18 and 2018/19, and the change is in particular associated with a large decrease in VAT revenue from the wholesale/retail sector, as discussed in Appendix D.

Figure 4.9 shows the contribution of each sector to the compliance, expenditure and non-taxable gaps. Each panel shows the three most important contributors to the relevant gap, as well as the sum of all other sectors. Figure D.1 in Appendix D breaks down the VAT gap for all sectors.

We find that the largest contributor to the increase in the compliance gap is the construction sector: between 2015/16 and 2021/22, the estimated compliance gap in the construction sector increased from 1.4% to 2.3% of GDP. This is strongly linked to the fall in VAT withholding, which is itself linked to the fall in public sector investment, as we will discuss shortly.

Figure 4.9. Contributions of each sector to the compliance, expenditure and non-taxable gaps



Note: 'Change in data source' indicates that a different source of data is used to determine VAT revenue by sector from 2018/19 onwards. This only affects the compliance gap, as the expenditure gap and non-taxable gap are derived solely from macrodata and are not affected by actual collections by sector. See Appendix D for methodology.

Source: Authors' calculations based on IMF VAT gap methodology (Hutton et al., 2019), tax administrative data from the Ministry of Revenue, national accounts from the Ministry of Planning and Economic Development, and the 2015/16 Social Accounting Matrix from Mengistu et al. (2019).

The compliance gap in the wholesale/retail sector also increased, from 0.2% to 0.8% of GDP between 2015/16 and 2021/22. Part of this increase may be a result of a change in data source between 2017/18 and 2018/19: between those years, VAT revenue attributed to the wholesale/retail sector decreased from 1.1% of GDP to 0.74% of GDP (see Appendix D). However, the wholesale/retail compliance gap also increased between 2016/17 and 2017/18 and between 2018/19 and 2021/22, so it is reasonable to conclude that the wholesale/retail compliance gap has increased at least somewhat. Other contributors to the growth in the compliance gap were the hotel/restaurant sector (0.1pp), mining (0.1pp) and smaller negative compliance gaps in information and communication and in other services.[34]

The largest contributor to the level of and increase in the non-taxable gap is the agriculture sector: between 2015/16 and 2021/22, the agricultural non-taxable gap increased from 3.8% to 4.3% of GDP. This mirrors the growth in agriculture as a percentage of GDP over the period. The non-taxable gap attributed to the financial and real estate sectors has also increased, from 0.1% to 0.3% of GDP and from 0.2% to 0.5% of GDP respectively. Finance is classed as non-taxable due to the administrative complexity of levying VAT on margin-based financial services. Part of the property sector is classed as non-taxable due to the difficulty of levying VAT on imputed rents for owner-occupied housing (Hutton, 2017). The rising non-taxable gap due to finance and real estate in Ethiopia reflects a broader trend across both developing and advanced economies towards services that are difficult to tax under a VAT, which has tended to increase the VAT gap (Cevik et al., 2019).

The expenditure gap is largest for the wholesale/retail sector, which reflects the sale of VAT-exempt foodstuffs and fuel, and the transportation sector, which reflects the fact that domestic passenger transport is exempt in Ethiopia. The net expenditure gap in all other sectors is negative, which can occur when inputs to a sector are VAT-exempt but outputs are not.

We now turn to discuss two specific factors that may explain why the VAT gap has increased: the role of recent policy choices, and the importance of VAT withholding to construction sector compliance.

[34] As the compliance gap is the residual in this model, negative compliance gaps can arise due to data quality issues with national accounts or sector-level VAT revenue, or if there is a misapplication of the law. They may also indicate that refunds have not been sufficient.

VAT policy

VAT policy has been broadly stable in Ethiopia since 2015/16. The most notable recent policy change has been the introduction of VAT exemptions for eggs, vegetable oils,[35] sugar, pasta and baby formula. Imported varieties of these goods were exempted in June 2020 to alleviate high food price inflation, and this was extended to domestically produced varieties in September 2021.[36] Wheat, rice and palm oil were also exempted from customs duty and surtax, but these goods were already exempt from VAT. The VAT exemptions were intended to be temporary but are still in place at the time of writing.

Estimating the cost of these exemptions is challenging due to data constraints. In particular, the 2015/16 Social Accounting Matrix (SAM) on which the VAT gap analysis is based does not distinguish between the production of eggs versus other animal products, or the production of pasta and baby formula versus other processed food. We break down expenditure on these broader categories using information on the shares of different products in imports (which does provide detailed product-level information). Doing this, we estimate that the newly introduced exemptions increased the expenditure gap by 0.05pp of GDP in 2021/22.

Other policy changes since 2015/16 include an increase in the compulsory VAT registration threshold from 0.5 million ETB to 1 million ETB in 2018, a reduction in the frequency of returns from monthly to quarterly for firms with annual turnover below 70 million ETB in 2019, and a reduction in the VAT withholding rate from 100% to 50% in 2019, as well as various reforms intended to simplify the VAT refund process. The current version of the VAT gap model is not suitable for costing these measures.

Of these changes, it is only the change in registration threshold that would be picked up in the expenditure gap, if we could model it. However, the reform of the VAT registration threshold is unlikely to have been costly as around 90% of (domestic, federal, excluding withholding) VAT in Ethiopia is paid by the largest 10% of firms (Brockmeyer et al., 2024), and many firms below the VAT registration threshold register for VAT voluntarily.

The reform of VAT withholding, frequency of filing and refund process policies would instead affect the compliance gap: these measures do not change VAT liabilities, merely collection arrangements. The reduction in the VAT withholding rate may have contributed to reduced revenues if compliance by businesses being withheld from is otherwise low. The reforms of the

[35] Except for palm oil, which was already VAT-exempt in Ethiopia.

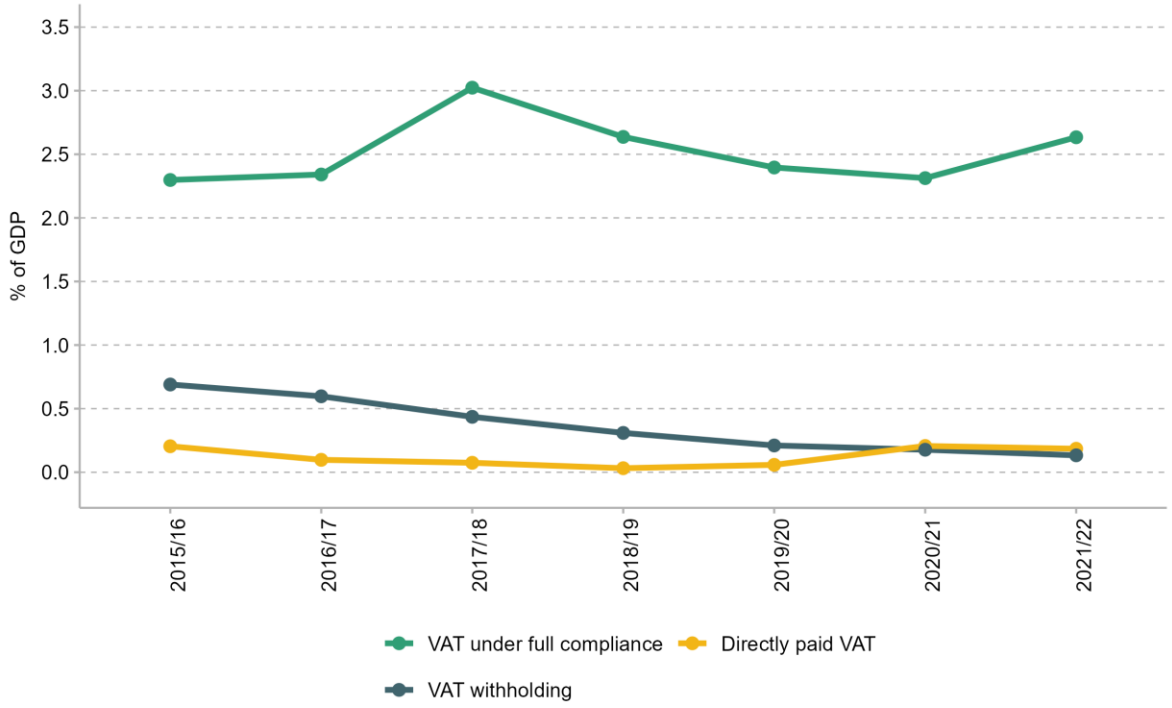
[36] For simplicity, the VAT gap model does not separately account for the fact that only imported varieties of these products became exempt from June 2020. Instead, it is assumed that both imported and domestically produced varieties of these products became exempt in FY 2021/22 and were standard-rated before.

frequency of filing and of refund policy may have had a positive effect on revenue if the reduced administrative burden of VAT encourages compliance.

Compliance in the construction sector

The construction sector has never paid significant VAT directly: at most, the equivalent of 0.21% of GDP, despite revenue potential of 2–3% of GDP. As already highlighted, the increase in the compliance gap in the construction sector is therefore closely linked to the decrease in VAT withholding, which in turn is linked to the decrease in public investment. In particular, using data on the share of VAT withheld that relates to the construction sector from 2019/20 and assuming this is representative for earlier years, we estimate that VAT withheld from the construction sector fell from 0.7% of GDP in 2015/16 to 0.13% in 2021/22, as shown in Figure 4.10. Without a commensurate increase in VAT paid directly by the construction sector, this implies that the increase in the compliance gap for the construction sector is largely due to a fall in withholding.

Figure 4.10. Role of VAT withholding in construction sector compliance



Note: 'Directly paid VAT' refers to actual VAT for the construction sector, minus the portion of actual VAT that is assumed to be VAT withholding.

Source: Authors' calculations based on IMF VAT gap methodology (Hutton et al., 2019), tax administrative data from the Ministry of Revenue, national accounts from the Ministry of Planning and Economic Development, and the 2015/16 SAM from Mengistu et al. (2019).

In other words, compliance in the construction sector has always been low, but it used to be higher because the public sector withheld and remitted VAT on its behalf. As public sector investment

has declined and the construction sector has become more oriented towards private rather than public sector construction projects,[37] the compliance gap has become even larger.

The growing compliance gap may also be due to VAT withholding agents failing to declare VAT withheld from their suppliers. As discussed earlier in this section, this may be happening for one public sector organisation. If this is due to non-compliance as opposed to other factors, it would also appear in the construction sector's compliance gap according to the VAT gap methodology.

It is also possible that the compliance gap has grown because of exemptions not included in the official list of exemptions. Unlike in some other countries, newly built residential property is subject to VAT in Ethiopia. Construction materials for publicly built residential property are exempt from VAT, which the model accounts for. There may, however, be ad-hoc exemptions for certain projects or for certain developers that are not included in the Legal Department of the Ministry of Finance's official list. Potential VAT under full compliance is itself based on the construction sector's share of GDP in the national accounts statistics, which may also be overstated.

Discussion: why did the VAT-to-GDP ratio fall?

The VAT gap analysis shows that the compliance and non-taxable gaps increased as a share of GDP between 2015/16 and 2021/22, while the expenditure gap stayed the same. The growing compliance gap does not necessarily mean that Ethiopia's tax administrators have been less effective. Instead, parts of the economy already subject to low compliance, or that are largely non-taxable under the VAT, may have become a larger share of the economy at the expense of more compliant and higher-taxed sectors.

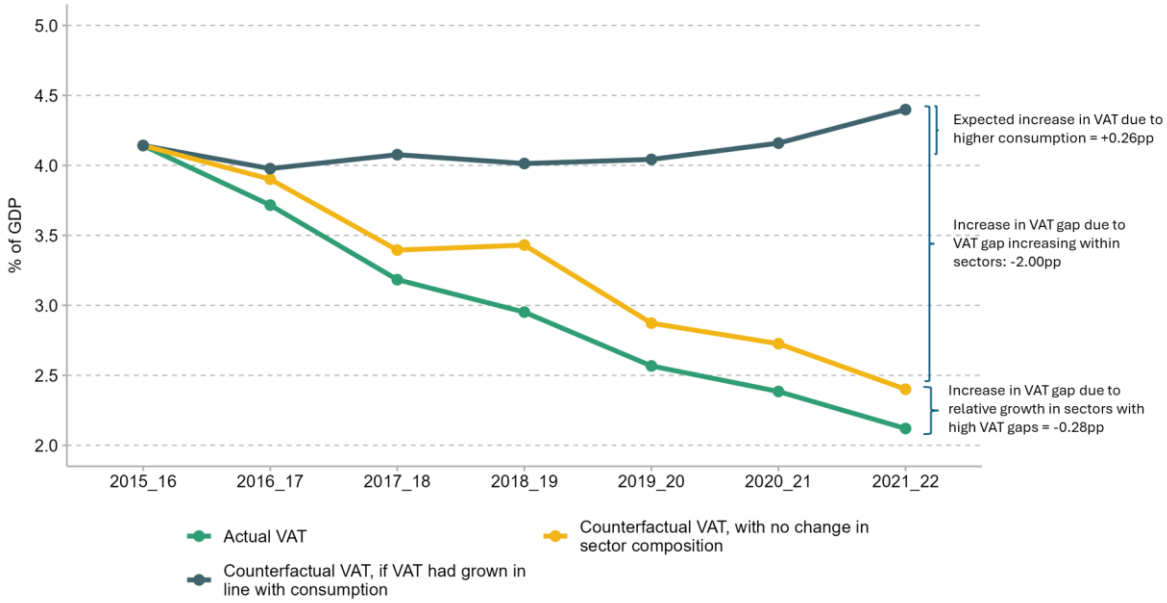
To account for this – and to begin estimating the fall in the VAT-to-GDP ratio that can be attributed to structural factors, policy factors and compliance-related factors – we consider two counterfactual scenarios: what the VAT-to-GDP ratio would be if the relative size of each sector had stayed the same as in 2015/16; and what the VAT-to-GDP ratio would be if it had grown in line with total consumption. The revenue implications of these two counterfactuals are shown in Figure 4.11.

Actual VAT revenue (net of refunds) is shown by the green line. The yellow line shows counterfactual VAT revenue if the relative size of each sector stayed the same as in 2015/16 (or more specifically, if the potential VAT in each sector as a share of total potential VAT in a given year was the same as in 2015/16). The difference between actual VAT and this counterfactual in

[37] Figure 3.5 shows that public investment as a share of total investment fell from 37% to 28% between 2015/16 and 2021/22. It is likely that the construction sector has correspondingly shifted away from public sector construction projects to private sector construction projects.

2021/22 is 0.28 percentage points. In other words, 0.28pp of the fall in the VAT-to-GDP ratio is because there has been growth in sectors that are relatively low-taxed at the expense of sectors that are relatively high-taxed. This appears to mainly be due to the increase in the shares in GDP of agriculture, finance and real estate, the outputs of which are generally exempt from VAT.

Figure 4.11. VAT-to-GDP ratio under counterfactuals



Note: 'Actual VAT' is VAT net of refunds. 'Counterfactual VAT, if VAT had grown in line with consumption' is equal to $PotentialVAT_t * {ActualVAT_{2015}}/{PotentialVAT_{2015}}$. 'Counterfactual VAT, with no change in sector composition' is $\Sigma_s \left[PotentialVAT_t * {ActualVAT_{s,t}}/{PotentialVAT_{s,t}} * {Potential\,VAT_{s,2015}}/{Potential\,VAT_{2015}} \right]$, where *s* is sector and *t* is year.

Source: Authors' calculations based on IMF VAT gap methodology (Hutton et al., 2019), tax administrative data from the Ministry of Revenue, national accounts from the Ministry of Planning and Economic Development, and the 2015/16 SAM from Mengistu et al. (2019).

The alternative counterfactual is that VAT revenue grows in line with total consumption, which is represented by the dark grey line. Over this period, final consumption (both household and government) increased from 78% to 85% of GDP. All else equal, this would have been expected to increase Ethiopia's VAT-to-GDP ratio by 0.26pp.

Changes in consumption and in the sectoral composition of GDP are clearly structural factors. The expected increase in VAT from higher consumption as a percentage of GDP (0.26pp) and the decrease in VAT from a change in sector composition (0.28pp) roughly cancel each other out.

The fall in the VAT ratio that is attributable to the VAT gap increasing within sectors (the difference between the dark grey line and the yellow line) is 2.0pp. In principle, this could be driven by the policy gap within sectors increasing or by the compliance gap within sectors increasing. The only major policy reform over this period was the introduction of VAT exemptions

for certain food products in 2020 and 2021, which we estimate reduced the VAT-to-GDP ratio by around 0.05pp. Other policy reforms, including the change in the VAT registration threshold and administrative reforms, are not costed but are also expected to have a small effect on the overall VAT-to-GDP ratio. Therefore, almost the entirety of the within-sector increase in the VAT gap is due to compliance decreasing within sectors.

A portion of the 2.0pp increase in the VAT gap within sectors is attributable to a falling amount of VAT being withheld by the public sector. For the construction sector (which accounts for 70% of withheld VAT), this has not been offset by increased VAT paid directly by companies as they pivot towards projects for the private sector (which is what the roughly constant contribution of construction to GDP implies they must have done). This suggests the reduction in the role of withholding has led to a significant reduction in overall VAT compliance by the construction sector.

If we assume that in other sectors none of the reduction in withheld VAT is offset by increased VAT paid directly, the overall fall in VAT withholding revenue between 2015/16 and 2021/22 (0.86pp) would be matched by an increase in the VAT compliance gap. Our earlier analysis suggested that around 70% of this, or 0.6pp, could be expected given the fall in public sector investment. Whether this is a between 'structural factors' or a 'compliance-related factors' is somewhat subjective. However, given that the fall in public investment was a significant factor for the economy of Ethiopia as a whole, we attribute the 0.6pp fall to 'structural factors'.[38]

This leaves us with 1.2pp of the decline in the VAT-to-GDP ratio that cannot be related to the change in GDP composition, the decline in withholding or policy changes. It may be the case that there are other structural or policy factors that can explain some of the remaining 1.2pp. For example, imports have fallen relative to overall consumption, and it is generally the case that compliance at the border is higher than compliance domestically (Morrow, Smart and Swistak, 2022). It may also be the case that ad-hoc or undocumented exemptions have eroded the VAT base. However, in the absence of hard evidence on import and domestic VAT compliance, on ad-hoc or undocumented exemptions, or indeed on any other structural or policy-related factors that may explain this, we attribute these 1.2 percentage points to 'compliance-related factors'.

[38] We noted earlier that the change in the VAT withholding rate from 100% to 50% is associated with a 0.1pp reduction in VAT withholding revenues. However, we are hesitant here to say it reduced the VAT-to-GDP ratio by 0.1 percentage points. The general observation is that VAT withholding from the construction sector is not offset by increased VAT directly paid by the construction sector as VAT withholding falls, which indicates that VAT withholding had a strong positive effect on overall compliance. However, VAT withholding falling because private sector firms stop selling to the public sector and being subject to VAT withholding (the external margin) is very different from VAT withholding falling because the VAT withholding rate goes from 100% to 50% (the internal margin). If this is the case, private sector suppliers are still being monitored by public sector buyers and still have an incentive to file for VAT to reclaim their input credits. We therefore do not take a stand on whether this policy reduced the overall VAT-to-GDP ratio.

This means that we attribute the overall decline in the VAT-to-GDP ratio between 2015/16 and 2021/22 as follows:

- 0.6pp to structural factors (the decline in public sector investment and its implications for VAT revenue).
- Less than 0.1pp to policy factors (specifically VAT exemptions for certain food products).
- 1.4pp to compliance-related factors (including changes in within-sector compliance, other than those linked to a decline in withholding associated with public sector investment).

This division is subject to both subjective judgements and data quality issues. The latter include changes to administrative microdata between 2017/18 and 2018/19 and the accuracy and detail of Ethiopia's national accounts, among others. However, it is clear that a combination of structural, compliance and policy implementation factors (rather than formal VAT policy changes) explain the vast majority of the decline in the VAT-to-GDP ratio.

4.2 Customs duty and surtax

Key findings

1. Customs duty and surtax fell from 2.1% of GDP in 2015/16 to 1.0% of GDP in 2022/23, accounting for a quarter of the total fall in the tax-to-GDP ratio over this period. This is almost entirely driven by the fall in goods imports from 24% to 10% of GDP.

2. The imports-to-GDP ratio can fall either if the price of imported goods falls relative to domestically produced goods (price changes) or if the quantity of imported goods falls relative to the quantity of domestically produced goods (quantity changes). Between 2015/16 and 2021/22, the fall in imports-to-GDP was mostly due to quantity changes.

3. The falling quantity of imports until 2021/22 was driven by falling imports of capital goods and industrial raw materials, which mirror the general fall in investment that took place over this period. The rationing of foreign exchange may also have contributed to the quantity changes by suppressing the demand for imports.

4. Between 2021/22 and 2022/23, the fall in the imports-to-GDP ratio was mostly due to price changes. It is highly likely that this was due to the Ethiopian birr becoming substantially overvalued in 2022/23.

5. Without this fall in import prices relative to domestic prices between 2021/22 and 2022/23, and holding everything else constant, the ratio of customs duty and surtax to GDP would have been 0.3 percentage points higher in 2022/23. This should not be taken as an estimate of the effect of foreign exchange liberalisation, which would likely affect import prices, quantities and real GDP.

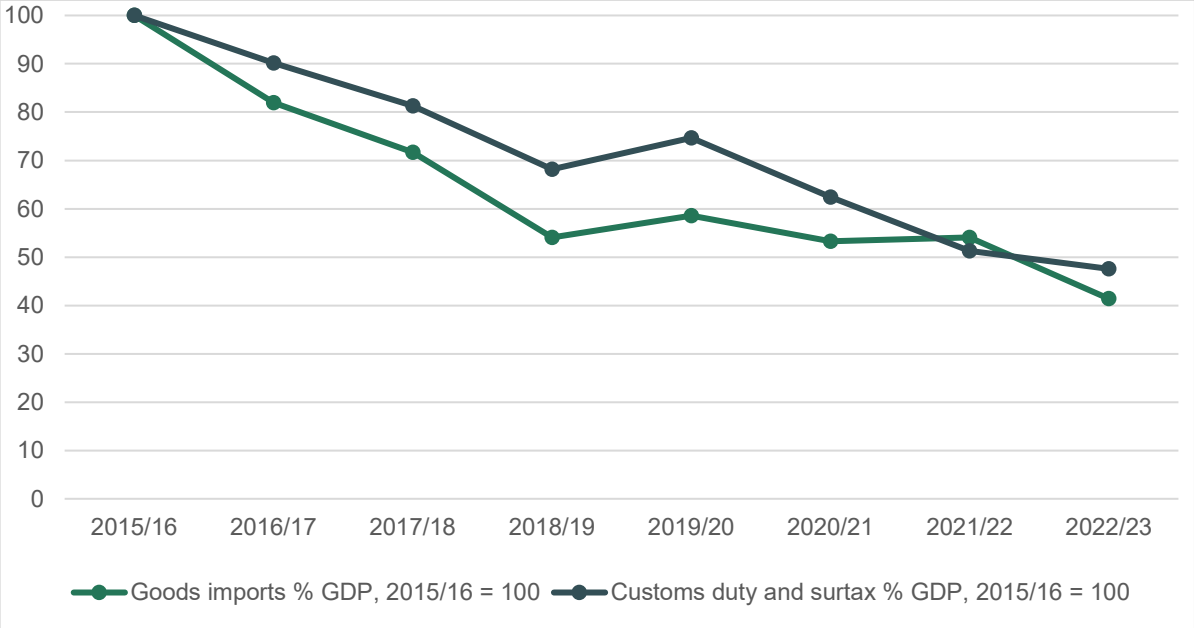
6. The fall in the imports-to-GDP ratio does not appear to be caused by importers under-reporting the value of imported goods to the customs authorities, although the poor quality of data on exports from some key trading partners means we cannot rule this possibility out completely.

This section specifically focuses on tax revenues from customs duty and surtax. The social welfare levy, which was collected from February 2023 onwards, is included within surtax by official revenue reports and is referred to under surtax in this section. VAT on imports, excise duties on

imports and withholding taxes on imports are not included in this section. Import VAT has already been covered in the previous section on VAT. Excise duty on imports is not covered because the decline in overall excise collection was not a major factor in the decline of the tax-to-GDP ratio. Withholding tax is creditable against corporate income tax and is therefore rarely a final tax.[39]

The ratio of customs duty and surtax to GDP has fallen closely in line with the ratio of (goods) imports to GDP, as shown in Figure 4.12.[40] Between 2015/16 and 2022/23, the ratio of imports to GDP fell by 59% (from 24% to 10%), whereas the ratio of customs duty and surtax to GDP fell by 52% (from 2.1% to 1.0%).

Figure 4.12. Goods imports and customs duty & surtax as a % of GDP, 2015/16 = 100



Note: The CIF value of goods imports is calculated based on ECMS customs microdata for 2018/19 to 2022/23, and from the UN's Comtrade database for 2015/16 to 2017/18. Comtrade contains the CIF value of Ethiopian imports at the HS6/month level, in US dollars. This is first converted to Ethiopian birr using the average annual exchange rate, and then collapsed to the Ethiopian fiscal-year level.

Source: Customs duty and surtax – Ministry of Finance official revenue reports. Goods imports – Comtrade (United Nations, 2024); ECMS customs microdata from the Ethiopian Customs Commission. GDP – Ministry of Planning and Economic Development.

[39] Although VAT on imports follows very similar trends to customs duties and surtax, it is considered together with the rest of the VAT system in the previous section, and to consider it again in this section would mean double-counting VAT on imports. The fall in excise revenues as a share of GDP has been small and is therefore outside the scope of this report. Withholding tax is not considered an import tax in the Ethiopian reporting system and represents a very small share of tax revenue.

[40] The measure of imports we use is the CIF value of imported goods, as opposed to the national accounts measure of imports. The CIF value is the basis on which duties and taxes are applied, while the national accounts measure of imports also includes some imported services and spending of Ethiopian residents abroad. Another difference is that the national accounts measure is based on FOB value rather than the CIF value (United Nations, 2003). Appendix E goes into more detail on the various measures of imports in Ethiopia.

Box 4.2. The effective tax on imports and trade tax expenditures

Between 2015/16 and 2022/23, the overall effective tax rate on imports (customs duty and surtax revenue as a percentage of goods imports) rose from 8.8% in 2015/16 to 10.1% in 2022/23. The overall effective tax rate on imports depends on three factors: the statutory tax rate on a given good, exemptions for certain importers or shipments that reduce the effective tax rate on a given good below the statutory rate, and the composition of imports. We briefly discuss the contribution of each of these factors to the increase in the overall effective tax rate, with further analysis in Appendix E.

First, the statutory rates of customs duties and surtax have generally decreased. In 2019, customs duty and surtax were removed from imports of certain agricultural inputs (Harris and Seid, 2021). Between June 2020 and September 2021, customs duty and surtax were reduced or removed for certain food products to alleviate food price inflation (Nair, Seid and Waltmann, 2024). In 2021, the surtax was abolished for all goods with a customs duty rate of 15% or less (Ministry of Finance, 2024). There was also a rationalisation of tariff rates in 2021, with raw materials and capital goods receiving lower tariff rates and consumer goods receiving higher rates (although it is unclear what the net effect of this was on statutory tax rates). The exception to this trend was the introduction of a social welfare levy of 3% in February 2023 on goods not subject to surtax.

Second, the composition of imports has had a neutral effect on the overall effective tax rate. If the composition of goods in 2022/23 had been the same as in 2015/16, the overall effective tax rate would only be 0.04 percentage points lower (see Appendix E for additional information). In other words, there has not been a general shift from high- to low-taxed goods.

The fact that the overall effective tax rate has increased whilst statutory tax rates have generally decreased, and without a shift from imports of high-taxed goods to low-taxed goods, must mean that effective tax rates within goods categories have moved closer to statutory tax rates. In other words, it is likely that (customs duty and surtax) tax expenditures as a percentage of imports were lower in 2022/23 than in 2015/16.[41] Official estimates of tax expenditures are only available from 2018/19 to 2020/21, but (customs duty and surtax) tax expenditures did fall slightly over this period. They are estimated to be 9% of imports in 2018/19, falling to 7% of imports in 2019/20 and rising to 10.2% of imports in 2020/21 (Ministry of Finance, 2022).[42]

[41] Tax expenditures are not exactly the same as the difference between effective and statutory tax rates. For example, exemptions for imports covered by international agreements (e.g. the Vienna Convention) are typically not included in tax expenditures. This measure of tax expenditures also includes the revenue foregone by the misapplication of statutory tax rates, as well as official tax exemptions.

[42] Or 1.6% of GDP in 2018/19, 1.0% of GDP in 2019/20 and 1.3% of GDP in 2020/21.

However, the small increase in the effective tax rate on imports over this period is not enough to offset the large fall in imports as a percentage of GDP, which is the focus of the rest of this section.

It is clear from Figure 4.12 that the main driver of the fall in customs duty and surtax revenue was the fall in imports. Understanding why imports fell so much as a percentage of GDP will be the main focus of this section. However, customs duty and surtax revenue did not fall by as much as the overall fall in imports over this period, meaning that the overall effective tax rate on imports (customs duty and surtax revenue as a percentage of goods imports) rose from 8.8% in 2015/16 to 10.1% in 2022/23. Box 4.2 briefly discusses the main drivers behind the increase in the effective tax rate on imports.

This section now examines the fall in the imports-to-GDP ratio by first presenting descriptive statistics on the fall in imports, breaking it down by goods category and decomposing it into price and quantity changes. The section then discusses Ethiopia's foreign exchange rate policy and its implications for customs duty and surtax revenues, and goes on to address the possibility that under-invoicing of imports at the border has contributed to the fall in officially recorded imports.

Which product categories contributed to the fall in the imports-to-GDP ratio?

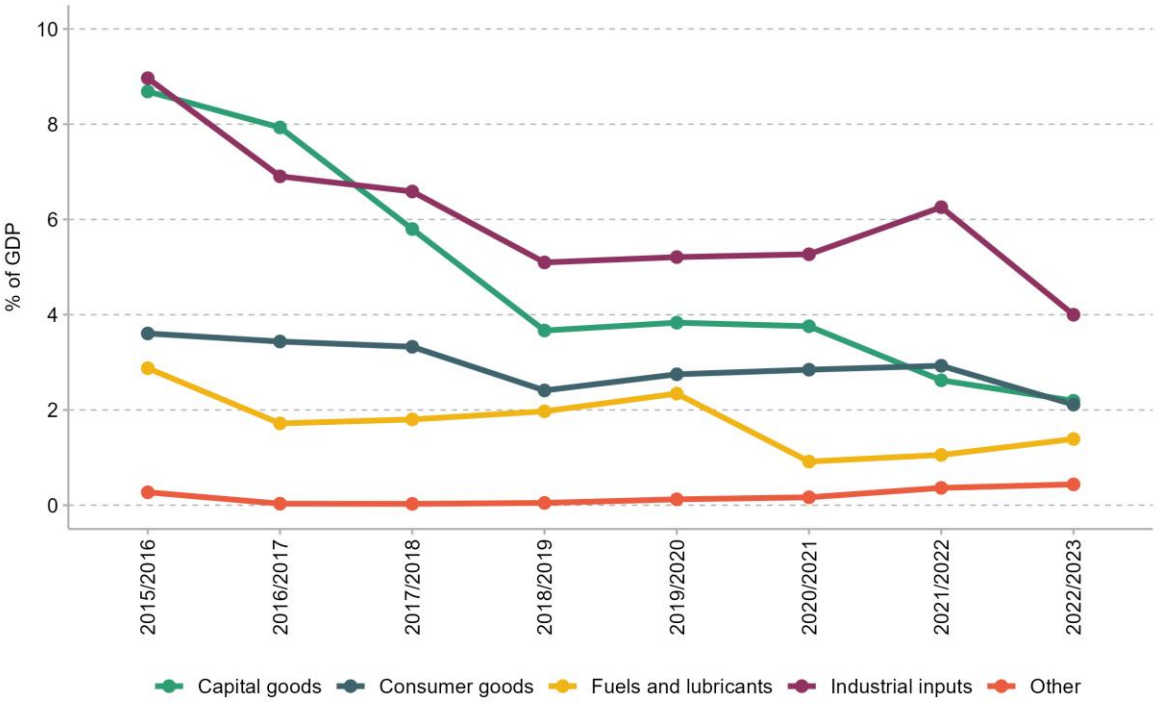
The fall in the goods imports-to-GDP ratio was driven by imports of capital goods and industrial inputs, as Figure 4.13 shows. Imports of capital goods fell from 8.7% of GDP in 2015/16 to 2.2% of GDP in 2022/23, accounting for 45% of the total fall in the imports-to-GDP ratio. Industrial inputs – which refer to raw materials for industry (excluding fuel, which is a separate category) – fell from 9.0% of GDP in 2015/16 to 4.0% of GDP in 2022/23, accounting for 35% of the total fall in the imports-to-GDP ratio. Imports of fuel fell from 2.9% to 1.4% of GDP, and imports of consumer goods, which in Ethiopia are mostly food and passenger vehicles, fell from 3.6% of GDP to 2.1% over the same period.

The fall in capital goods imports mirrors the general fall in investment in the Ethiopian economy. Importing a capital good, by definition, results in investment.[43] Investment, both public and private, fell from 37% to 22% of GDP between 2015/16 and 2022/23. Imports of capital goods fell by 75% relative to GDP, meaning that imported capital goods now account for a smaller share

[43] National accounts treat the acquisition of a capital good – whether domestically produced or imported – as investment (gross capital formation) (United Nations, 2003). However, the definition of capital goods in national accounts is not exactly the same as in Figure 3.13. For example, a refrigerator is classified as a consumer good in the OECD conversion table and should therefore be treated as consumption in the national accounts, but if it is purchased by a company for production purposes, it should be treated as investment in the national accounts (United Nations, 2003).

of total investment. The fall in investment may also have caused some of the fall in the import of industrial raw materials, as this category includes construction materials such as iron and steel.

Figure 4.13. Breakdown of the fall in imports by import category



Note: The underlying data are based on merging data from the UN's Comtrade database for the period covering 2015/16 to 2017/18 with Ethiopian customs microdata from the ECMS for the period covering 2018/19 to 2022/23. This is done because Ethiopian customs microdata for earlier periods are unreliable (see Figure E.1 in Appendix E). Comtrade data for Ethiopia contain the value and volume of imports at the HS6/month level, in USD. They are first converted to ETB using the average annual official exchange rate, and then collapsed to the Ethiopian fiscal year. Customs microdata from ECMS are available at the shipment/month level and are collapsed to the HS6/fiscal-year level. Imports by HS6 are then converted to Broad Economic Categories (BEC), using a conversion key between HS6 codes and BEC codes provided by the OECD (https://www.oecd.org/en/data/datasets/bilateral-trade-in-goods-by-industry-and-end-use-category.html). In the graph, 'Capital goods' refers to BEC codes 4 'Capital goods (except transport equipment) and parts and accessories thereof', 521 'Transport equipment, and parts and accessories thereof – Industrial' and 53 'Transport equipment, and parts and accessories thereof – parts and accessories'; 'Industrial inputs' refers to BEC codes 111 'Food and beverages – primary – mainly for industry', 121 'Food and beverages – processed – mainly for industry' and 2 'Industrial supplies not elsewhere specified'; 'Consumer goods' refers to BEC codes 112 'Food and beverages – primary – mainly for household consumption', 122 'Food and beverages – processed – mainly for household consumption', 51 'Transport equipment, and parts and accessories thereof – passenger motor vehicles', 522 'Transport equipment, and parts and accessories thereof – non industrial' and 6 'Consumer goods not elsewhere specified'; 'Fuels and lubricants' refers to BEC code 3 'Fuels and lubricants'; and 'Other' refers to BEC code 7 'Goods not elsewhere specified', and also includes products where the HS6 code in the customs data does not have a match in the OECD's conversion table.

Source: Comtrade – United Nations (2024); ECMS customs microdata – Ethiopian Customs Commission; GDP data – Ministry of Planning and Economic Development.

Capital goods are more lightly taxed than consumer goods but are not completely untaxed. The effective customs duty and surtax rate on capital goods imports was 9.2% in 2022/23, compared with 18.9% for consumer goods. The effective customs duty and surtax rate was 8.0% for industrial raw materials and 0.3% for fuel. Appendix E goes into more detail on how the change in the composition of imports has affected the overall effective tax rate on imports.

Figure B.5 in Appendix B further disaggregates the fall in imports into HS2 chapters. The largest falls between 2015/16 and 2022/23 were recorded under chapters 84 'Machinery and mechanical appliances', 85 'Electrical machinery', 27 'Mineral fuels', 87 'Vehicles', 73 'Iron and steel articles' and 72 'Iron and steel'.

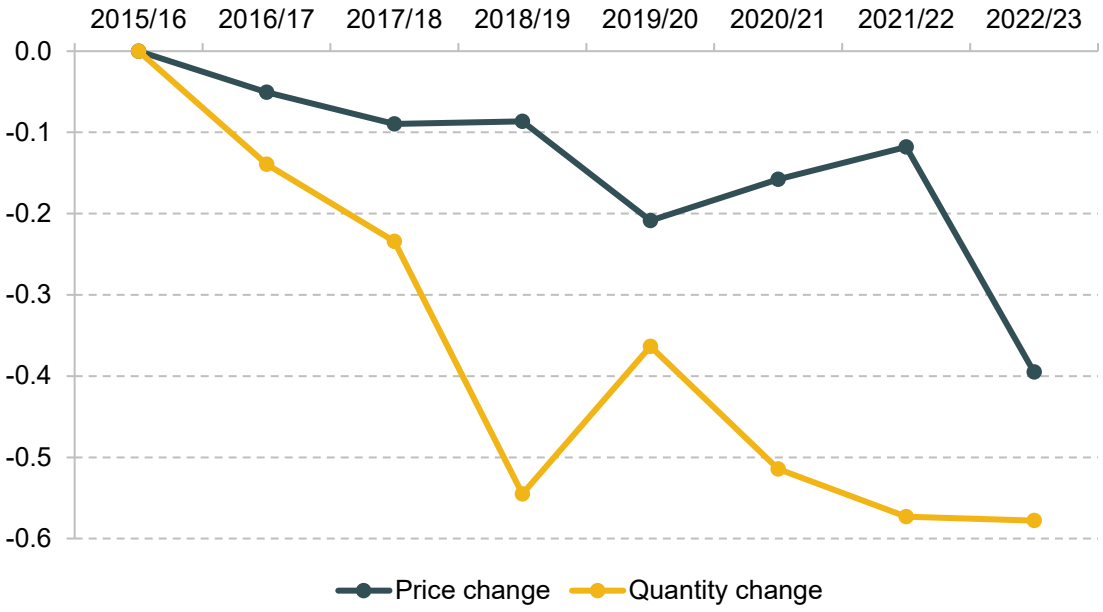
Does the reduction in the imports-to-GDP ratio come from reduced prices or reduced quantities?

It is possible to decompose changes in the imports-to-GDP ratio into price and quantity changes. Imports are equal to the price of imported goods multiplied by the total quantity of those goods. Similarly, GDP is equal to the price of domestically produced goods multiplied by the total quantity of domestically produced goods. Therefore, the imports-to-GDP ratio could have declined either because the price of imported goods fell relative to the price of domestically produced goods or because the quantity of imported goods fell relative to the quantity of domestically produced goods. As customs data contain both the CIF value and the weight of imported goods, it is possible to estimate the price and quantity of imported goods. We take the GDP deflator as the price of domestically produced goods and real GDP as the quantity of domestically produced goods. The methodology is described in more detail in the notes under Figure 4.14.

This decomposition can be informative about why the value of imports fell. A general fall in the prices of imports relative to the prices of domestically produced goods could point to a general improvement in Ethiopia's terms of trade or – more plausibly – an increasing overvaluation of the Ethiopian birr.[44] Quantity changes will reflect changes in demand or the effect of foreign exchange rationing.

[44] The price change in this decomposition is very similar in concept to the real effective exchange rate. The real exchange rate for Ethiopia is the nominal exchange rate between Ethiopia and country X multiplied by the ratio of the price level (typically the CPI) between Ethiopia and country X. The real effective exchange rate is a combination of the real exchange rate weighted by the trade shares of Ethiopia's trading partners (Catão, 2007). The real effective exchange rate is essentially a comparison of prices in Ethiopia with prices in Ethiopia's trading partners, while this decomposition is based on a comparison of prices of domestically produced goods in Ethiopia with prices of imported goods.

Figure 4.14. Decomposition of the fall in goods imports into price and quantity changes



Note: The imports-to-GDP ratio can be written as $p_{t,m}q_{t,m}/p_{t,d}q_{t.d}$, where $p_{t,m}$ is the level of import prices, $q_{t.m}$ is the quantity of imports, $p_{t,d}$ is the domestic price level and $q_{t,d}$ is the quantity of domestic production, all in year *t*. The ratio between imports-to-GDP in year *t* and imports-to-GDP in 2015/16 can be written in log terms as $[\{\log(p_{t,m}) - \log(p_{t,d})\} - \{\log(p_{2015,m}) - \log(p_{2015,d})\}] + [\{log(q_{t,m}) - log(q_{t,d})\} - \{log(q_{2015,m}) - log(q_{2015,d})\}]$, where the term in the first square brackets is the 'change in prices' or the difference in the growth rate between import prices and domestic prices, and the second term is the 'change in quantities', or the difference in the growth rate between import quantities and domestic quantities. The GDP deflator index is used as the measure of domestic prices, and real GDP is used as the measure of domestic volumes. Import prices are calculated by dividing the CIF value of imports by the net weight of imports. This is calculated at the HS6 level, to create a price and volume for each HS6 category. It is aggregated by creating a Fisher index for import quantities and dividing the total value of imports by the Fisher quantity index. To be included in the Fisher index for year *t*, the weight and CIF value of the HS6 category must be available in 2015/16 and in year *t*. ECMS customs microdata are used for weights and CIF values between 2018/19 and 2021/22. The UN's Comtrade database is used for 2015/16 to 2017/18, due to issues with customs microdata during this period (see Appendix E). Comtrade is originally available at the HS6/month level in USD. This is first converted to ETB using the average annual official exchange rate, and then aggregated to the HS6/fiscal-year level. ECMS customs microdata are originally available at the shipment/month level and are also aggregated to the HS6/fiscal-year level.

Source: Comtrade – United Nations (2024); ECMS customs microdata – Ethiopian Customs Commission; GDP data – Ministry of Planning and Economic Development.

Figure 4.14 shows that quantity changes drove the fall in imports as a share of GDP between 2015/16 and 2021/22, as real GDP grew faster than the quantity of imported goods (real imports). Real GDP increased by 0.4 log points between 2015/16 and 2021/22, whereas real imports decreased by 0.17 log points, resulting in an overall relative quantity change of –0.57 log points as shown in the graph.

Price changes were a minor contributor to the fall in the imports-to-GDP ratio until 2021/22. Between 2015/16 and 2021/22, the price of domestically produced goods (the GDP deflator) increased by 0.96 log points, while the import price increased by 0.85 log points, resulting in an

overall relative price change of –0.12 log points in 2021/22 as shown in Figure 4.14. Price changes explain almost all of the fall in imports between 2021/22 and 2022/23, however. The price of domestically produced goods increased by 33% between 2021/22 and 2022/23, whereas the price of imported goods did not change, resulting in a sharp fall in the imports-to-GDP ratio from 13.1% to 10.0%.

We repeat the price/quantity decomposition for each category of imports, and the results are presented in Figure B.6 in Appendix B. The results for overall imports (that quantity changes were dominant until 2021/22, and price changes between 2021/22 and 2022/23) also broadly hold within import categories. In particular, we find that imports of capital goods as a share of GDP fell between 2015/16 and 2021/22 as Ethiopia imported fewer *units* (relative to real GDP) of machinery, iron and steel, and vehicles, amongst other goods needed to build dams, railways and other investment projects. There was no substantial fall in the price of capital goods relative to domestically produced goods over this period.

The role of foreign exchange

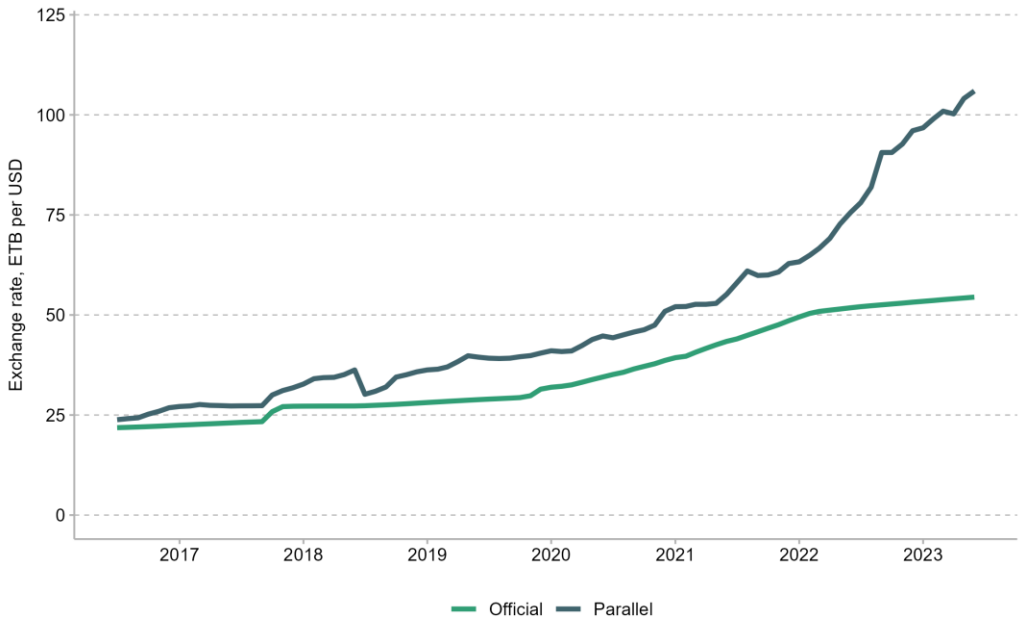
Both price and quantity changes may be linked to Ethiopia's foreign exchange policy. We first start by describing Ethiopia's foreign exchange situation and recent developments in Box 4.3, before turning to its implications for the tax-to-GDP ratio.

Box 4.3. Background: foreign exchange in Ethiopia

Ethiopia's official exchange rate regime is a crawling peg to the US dollar. Within the period from 2019/20 to 2022/23, there were broadly three different regimes characterised by different rates of crawl. Until November 2019, the Ethiopian birr depreciated at an annualised rate of 9% against the US dollar. From November 2019 to March 2022, it depreciated at a much faster rate of 25% a year against the dollar. From March 2022, the rate of depreciation was again around 5%.

Access to foreign exchange is tightly controlled in Ethiopia. Exporters are required by law to convert their foreign exchange earnings into Ethiopian birr at the official exchange rate, and importers generally need a permit from the National Bank of Ethiopia to obtain foreign currency. Nonetheless, there has long been a parallel market for foreign exchange where Ethiopian birr are traded at floating rates, as shown in Figure 4.15). Historically, US dollars have been around 30% more expensive in the parallel market than at the official exchange rate. However, since the rate of crawl was adjusted downwards in March 2022, this gap has widened considerably, as the Ethiopian birr has shown no sign of slower depreciation in the parallel market; if anything, it has depreciated at an even faster rate. As a result, in June 2023, one US dollar cost nearly twice as much on the parallel market as at the official exchange rate.

Figure 4.15. Official and parallel exchange rates



Note: Monthly average exchange rate.

Source: National Bank of Ethiopia.

There has long been a shortage of foreign exchange in Ethiopia. In 2018, the waiting time for foreign exchange permits was 4–12 months for 'essential' imports and up to 3 years for 'non-essential' imports (Lloyd and Teshome, 2018). From mid 2020, the government allowed some businesses to import selected basic food items through the '*franco valuta*' scheme. This is a special import permit scheme where businesses are allowed to import without a National Bank of Ethiopia foreign exchange permit using their own foreign currency held abroad. This effectively means that they can use the offshore (but not the onshore) parallel foreign exchange market to acquire funds to finance imports. In April 2021, *franco valuta* was made available to all importers of basic food items, subject to meeting some conditions set by the National Bank of Ethiopia.

This report does not go into detail on the underlying causes of Ethiopia's foreign exchange issues. Other authors have pointed to unsustainably high public investment, conflict, weak export and remittance performance, and inflexible policy (Dutu et al., 2023; Haile, 2019).

It is highly likely that the large relative price change observed in 2022/23 is primarily a consequence of the increasing overvaluation of the Ethiopian birr, by which we mean an increasing upward divergence in the value of the Ethiopian birr from the value that would obtain if it was freely traded. In March 2022, the National Bank of Ethiopia slowed down the birr's rate of crawl against the dollar to a rate substantially below the difference in inflation rates between Ethiopia

and the United States. As one might have expected, this was accompanied by the emergence of a large parallel market premium for dollars.

Other factors may also have played a role. Global commodity prices fell back from their very high levels in 2021/22, which may have affected import prices more than domestic prices. In general, the prices of domestically produced non-tradeable goods also tend to increase faster than the prices of imported goods as countries develop (Catão, 2007). However, it is unlikely that this latter effect explains such a sharp change in relative prices in one year.

Foreign exchange policy may also have contributed to changes in relative quantities between 2015/16 and 2021/22. In particular, the rationing of foreign exchange – which has been an issue in Ethiopia for many years – may have increasingly suppressed imports. Increased overvaluation in 2022/23 may have exacerbated the foreign exchange shortage.

As a partial measure of the tax implications of the recent overvaluation, we simulate import tax revenue in the absence of the relative price change between 2021/22 and 2022/23.[45] This is partial as quantities are held constant, even though they may also have been affected by foreign exchange policy. If we apply the difference in imports between 2021/22 and 2022/23 of 3.1 percentage points, multiplied by the effective tax rate on imports in 2022/23, counterfactual customs duty and surtax revenue would be 0.3 percentage points of GDP higher.

This number should not be taken as a prediction of the effect of exchange rate liberalisation on the tax-to-GDP ratio, which could be higher or lower than 0.3pp for several reasons. First, this estimate is based on the relative price change between 2021/22 and 2022/23, but the exchange rate may have been significantly overvalued in 2021/22 already. Second, quantities are unlikely to be unchanged in practice. As the price of imports rises (due to a depreciation of the birr against the dollar), standard economic theory would suggest that the quantity of imported goods should fall. However, the rationing of foreign exchange indicates there is a large unsatisfied demand for imports at the current exchange rate. In addition, traders operating under the *franco valuta* scheme are already allowed to trade at the parallel market rate and are therefore less affected by exchange rate liberalisation. Third, the 0.3pp figure is holding constant real GDP, whereas an actual exchange rate liberalisation is likely to affect real GDP.

[45] An alternative counterfactual is to calculate customs duty and surtax if the parallel market rate was the exchange rate, again holding constant the quantity of imports. Given that the parallel market rate has been around double the official rate, customs duty and surtax would also be around double, or 1.1 percentage points of GDP higher. However, the parallel market exchange rate may not be a good proxy for the equilibrium exchange rate that would obtain if the birr was free-floating, as it was also affected by the authorities' attempt to crack down on it (Lloyd and Teshome, 2018).

Import tax evasion via under-invoicing

The imports-to-GDP ratio may have also fallen as a consequence of import tax evasion. If importers increasingly under-invoice the CIF value of imported goods to customs, then reported imports and import tax revenue as a share of GDP would fall. Importers may under-invoice the CIF value in order to avoid paying import taxes. More recently, there have also been concerns that foreign exchange rationing may encourage importers to under-invoice CIF values in order to hide the source of foreign exchange.[46] Import tax evasion can also occur through product misclassification, where importers deliberately declare their goods under incorrect, lower-taxed HS codes. Although product misclassification by itself does not affect the total CIF value of declared imports, it results in reduced import tax revenues.

Import tax evasion through smuggling is a separate issue. Smuggling – or importing goods through unofficial channels – would affect both officially declared imports and import taxes. As we are not aware of any reliable data on the total amount of smuggled goods to Ethiopia, we do not quantify the impact of smuggling on total imports or import tax revenues.[47]

This subsection uses two methods to detect import tax evasion via under-invoicing. The first method is to measure the 'import gap', i.e. to compare reported exports to Ethiopia by its trading partners with reported imports at Ethiopian customs. For example, if the value of exports from the United States to Ethiopia in a given year is reported by the US as $1 billion, but the value of imports reported by Ethiopia from the US is only $0.5 billion, the discrepancy may be due to traders under-invoicing imports to avoid tax. This method is well established in the literature (Fisman and Wei, 2004) and has been used previously in Ethiopia (Mengistu, Molla and Mascagni, 2022). The second method is to compare import prices in Ethiopia with import prices in similar countries: for example, if a kilogram of steel is substantially cheaper at the Ethiopian border than in other countries, it may be because importers are under-reporting the CIF value (but not the weight) of imported steel to the Ethiopian customs authorities.

Both methods result in a measure of 'net' under-invoicing. It may be the case that traders under-invoice the CIF value of certain imported shipments to avoid tax or to disguise the source of foreign exchange. However, this may be partially or fully offset by the Ethiopian customs

[46] Consider an importer who wishes to import $1,000 worth of goods. Due to rationing of foreign exchange, they may only receive $100 in official foreign exchange and are forced to find the remaining $900 on the parallel market. As importers are required to provide proof of the source of foreign exchange used to purchase the import, the importer in this example has a strong incentive to declare that the value of the goods is $100 instead of $1,000. The consequence of this is that the value of officially reported imports, and import taxes, falls.

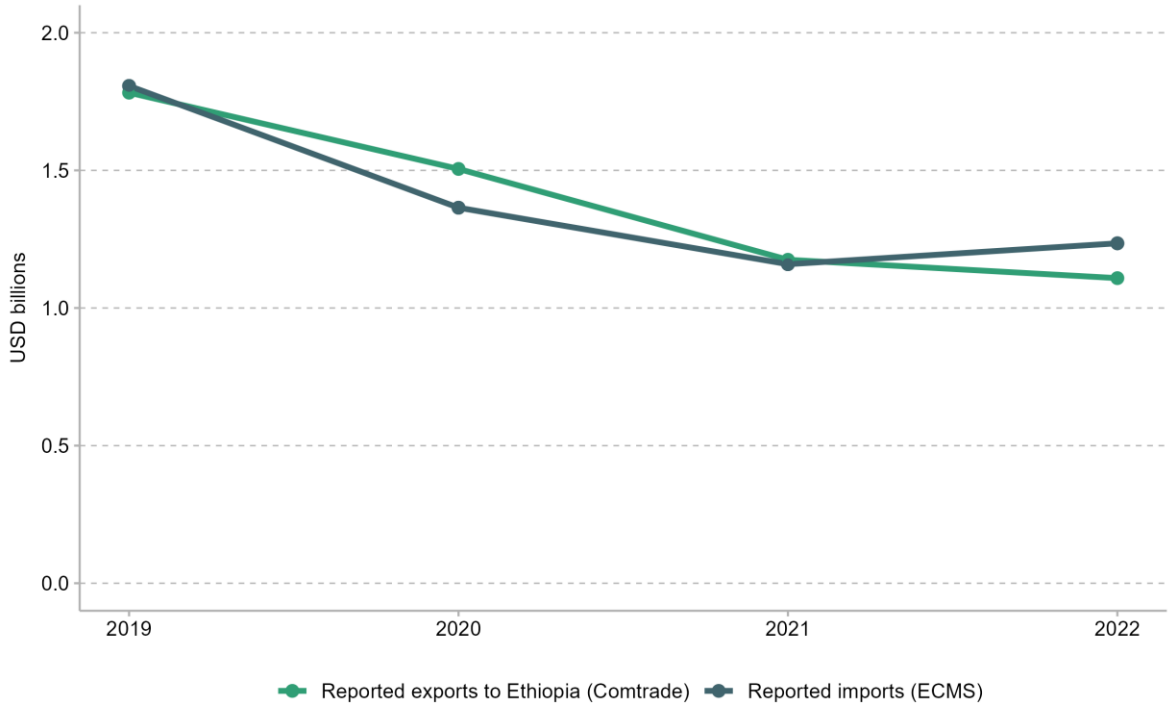
[47] The Customs Commission has reported an increase in smuggling, and has claimed to have seized 5.3 billion ETB worth of smuggled goods in the eight months to April 2023, or about 0.1% of GDP on an annualised basis (https://www.thereporterethiopia.com/33365/#:~:text=The%20Commission%20confiscated%20illicit%20goods,contraband%20was%20captured%20last%20year). However, this figure is likely to be much lower than the actual value of smuggled goods.

authorities over-invoicing other shipments to reach tax revenue targets, or by traders deliberately over-invoicing other shipments in order to offset other tax liabilities. The combinations of all of these actions – or the 'net' effect – is still relevant for understanding why imports fell so much over the period 2015/16 to 2022/23. The conclusion of both methods is that under-invoicing, or specifically net under-invoicing, does not appear to be particularly high, nor does it appear to have increased since 2019.

We start with the import gap, which requires the use of data on exports to Ethiopia from other countries from the UN's Comtrade database. An acknowledged problem is that the export records of many of Ethiopia's trading partners are known to be inaccurate,[48] so we follow Mengistu, Molla and Mascagni (2022) and only include trading partners that are known to have robust export data. Figure 4.16 shows that amongst this group of countries, the value of reported exports to Ethiopia (the green line) is very similar to the value of reported imports by Ethiopia (the dark grey line).

[48] For example, China's officially reported exports are believed to be $230 billion lower than its true exports (https://www.economist.com/finance-and-economics/2023/12/14/is-china-understating-its-own-export-success). This likely explains why Ethiopia reported $5 billion of imports from China in 2022, whereas China only reported $2 billion in exports to Ethiopia, or a negative import gap (see Figure B.7 in Appendix B).

Figure 4.16. Import gap in Ethiopia and select trading partners



Note: 'Reported imports (ECMS)' refers to the CIF value of imports from other countries reported by Ethiopia. It is based on shipment-level customs microdata and is aggregated to the calendar year. It is then converted into USD using the annual average official exchange rate to be comparable with the Comtrade data. 'Reported exports to Ethiopia (Comtrade)' refers to the FOB value of exports from other countries to Ethiopia. Belgium, France, Germany, Switzerland, the Netherlands, the US, the UK, Japan, Canada and Australia are the trading partners considered in this analysis, in line with Mengistu, Molla and Mascagni (2022), as they are considered to have reliable export trade statistics. Imports from these countries account for 10–20% of total Ethiopian imports.

Source: ECMS customs microdata – Ethiopian Customs Commission. Comtrade – United Nations (2024).

This analysis indicates that net under-invoicing on imports from select high-income countries appears to be small. A minor caveat here is that we are comparing the FOB value of exports and the CIF value of imports. In general, CIF values are higher than FOB values as CIF values include trade costs. Mengistu, Molla and Mascagni (2022) are able to construct a measure of trade costs for Ethiopia, which is equal to the difference between CIF and FOB values as a percentage of the CIF value, as their dataset contains this information, but ours does not. The average trade cost, across all six-digit HS categories in 2015, is reported by Mengistu et al. (2022) at 10.37%. If we adjust the dark grey line in Figure 4.16 downwards by this amount to adjust for trade costs, we still do not change the conclusion that import tax evasion via under-invoicing of CIF values does not appear to be large, at least for imports from certain high-income countries.

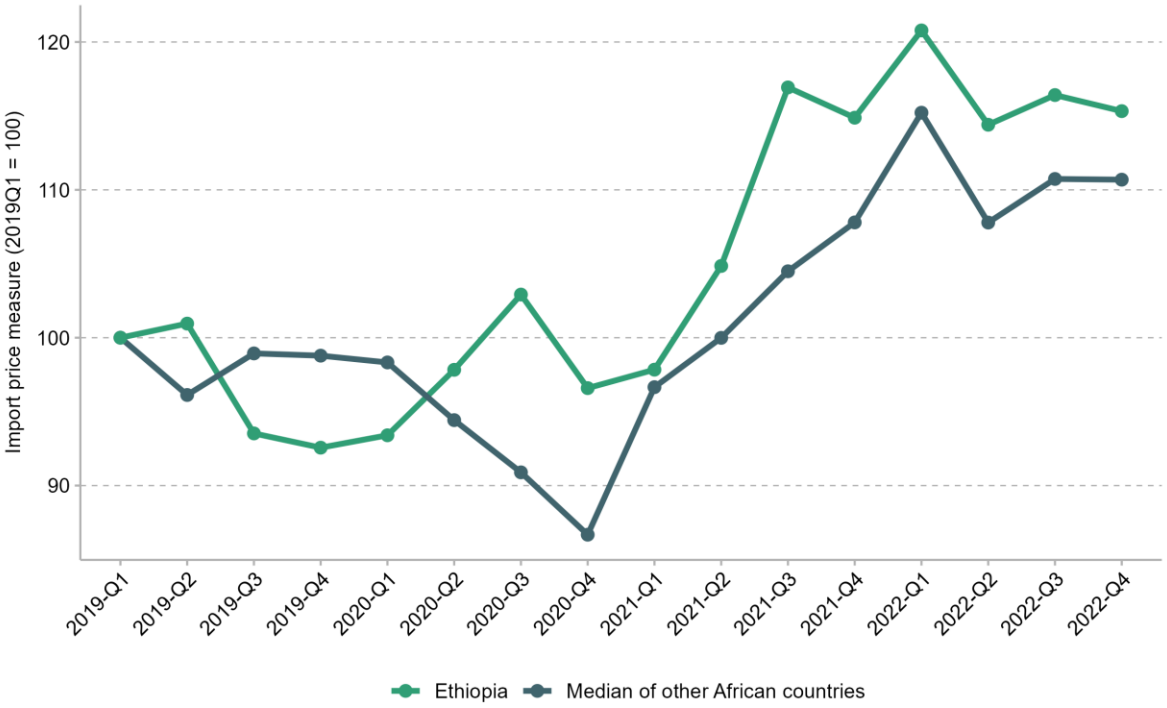
A more important drawback to the import gap method is that these countries account for only 10–20% of Ethiopia's imports, and it may be that under-invoicing is more prevalent in Ethiopia's trade with low- and middle-income countries.

The second approach for detecting under-invoicing is to compare import prices in Ethiopia with those in other African countries. The key methodological issue here is that prices for imports are at the commodity level: for example, we know the average price of imported steel in a given month, or the average price of imported wheat or the price of imported aircraft parts, but we need to aggregate these individual prices over the thousands of types of imported products. For the Ethiopian import price index, we use an index similar to that used for the consumer price index, which weights each commodity according to its imports relative to total imports for Ethiopia. For other countries, we also weight each commodity relative to its imports relative to total imports for Ethiopia. This methodological choice also means we can only compare how prices in Ethiopia and in other countries change over time, rather than the levels of prices in Ethiopia versus other countries.

If import tax evasion via under-invoicing had substantially increased in Ethiopia relative to other African countries, we would expect the price growth of imports to be lower in Ethiopia than in other African countries. Figure 4.17 shows that this does not appear to be the case: Ethiopian import prices rose by 15% between the first quarter of 2019 and the last quarter of 2022, slightly more than the 11% increase in import prices for other African countries.

An important limitation of this method is that it can only detect import tax evasion through undervaluation if the trader understates the value but not the volume (in kilograms or litres) of the product. We understand that the Ethiopian Customs Commission's risk management system classifies importers into risk categories and only those classified as low risk have their goods released without further checks on import weight, making it more difficult for importers to under-report the volume rather than the value of the product.

Figure 4.17. Change in import prices relative to 2019Q1, Ethiopia and other African countries



Note: Quarters are western calendar year quarters, such that 2019Q1 refers to January–March 2019. The import price measure for Ethiopia is based on ECMS customs data on the CIF value and weight of each shipment, and is collapsed to the quarter/HS6 level. The price for a given HS6 commodity is the sum of the quarterly CIF value over the sum of the quarterly volume, and is expressed in dollars. Prices for each HS6 commodity are aggregated to an overall import price measure using a Fisher index based on quarterly prices and annual volumes with a base period of 2019Q1 (the index is based on annual volumes instead of quarterly volumes as the latter are volatile due to lumpy shipments). Observations are for fuel imports in 2021Q2 and 2021Q3, and parts for hydraulic turbines in 2019Q2 are dropped due to large outliers in price.
Import prices for other African countries are derived from Comtrade data. The prices are aggregated to a single price index for each country using a modified Fisher index based on Ethiopian import volumes. The interpretation is that these are the prices of imports for other countries, weighted towards the types of products that Ethiopia imports the most of. Other African countries are all countries that have import price data at the HS6/quarter level in Comtrade, which are Angola, Botswana, the Democratic Republic of the Congo, Egypt, Madagascar, Mozambique, Rwanda and Tanzania.

Source: Comtrade – United Nations (2024); ECMS customs microdata – Ethiopian Customs Commission.

Although each individual method has its weaknesses, it is reassuring that neither the import gap analysis nor the import price change comparison shows evidence of a net increase in under-invoicing. However, both methods are based on data from goods imported through official channels, and do not capture cases of import tax evasion through smuggling. We cannot rule on whether an increase in smuggling has contributed to the fall in the official value of reported imports.

Discussion: why did the ratio of customs duty and surtax to GDP fall?

Within the framework set out in Chapter 1, all of the 1.1 percentage point fall in customs duty and surtax as a share of GDP is attributed to the category 'structural factors', as it is a result of falling imports as a share of GDP. A fall in the quantity of imports was the largest driver of this between 2015/16 and 2021/22, but a fall in the measured price of imports, linked to the increasing overvaluation of the birr at the official exchange rate, was the largest driver between 2021/22 and 2022/23. Imports of capital goods and industrial inputs have fallen particularly sharply, suggesting the fall in imports is linked to the decline in public and (to a lesser extent) private sector investment.

4.3 Corporate income tax

Key findings

1. Corporate income tax (CIT) fell from 1.77% of GDP in 2015/16 to 1.03% of GDP in 2022/23, accounting for 16% of the total fall in the tax-to-GDP ratio.

2. The Commercial Bank of Ethiopia accounts for 0.15 percentage points of the decline in the CIT-to-GDP ratio (between 2015/16 and 2021/22). This is because the bank was extremely profitable in the mid-2010s and has since returned to a more typical level of profitability.

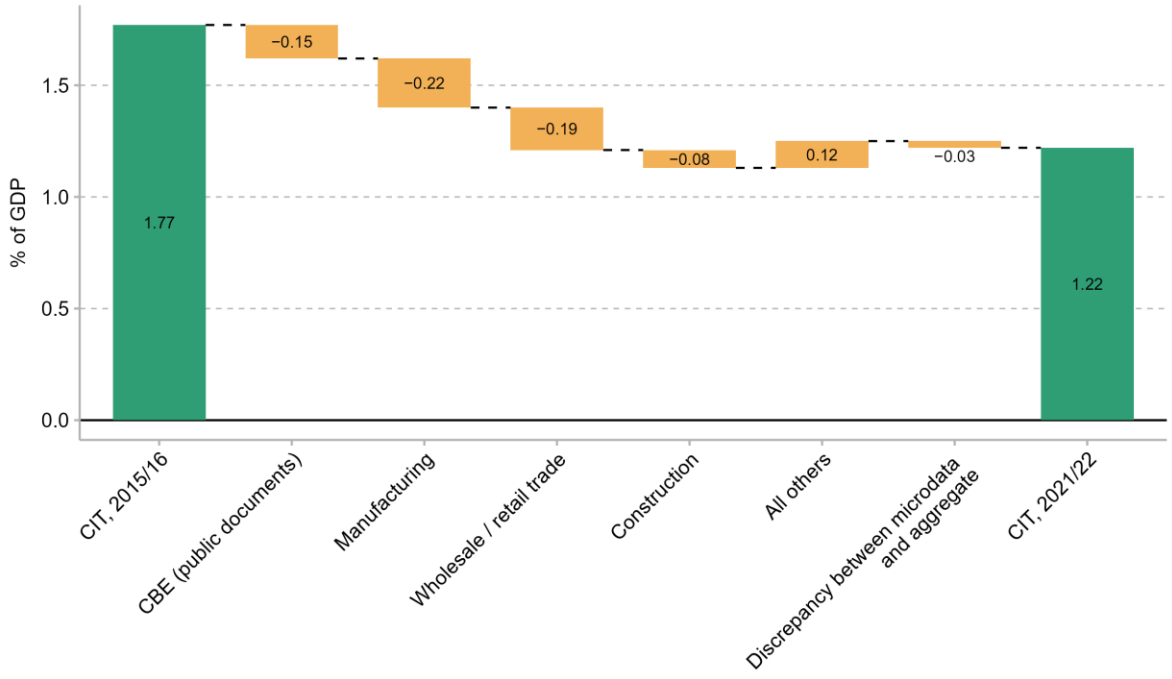
3. A further 0.4 percentage points is explained by increasing CIT 'underperformance' between 2015/16 and 2021/22, especially in the wholesale/retail and construction sectors. One explanation for CIT underperformance is non-compliance, though it is not possible to distinguish non-compliance from other factors.

Corporate income tax (CIT) is the tax levied by the federal government on the profits of corporations. Between 2015/16 and 2022/23, the CIT-to-GDP ratio fell from 1.77% to 1.03%, or 0.74 percentage points. Due to the availability of microdata, this section focuses on the period between 2015/16 and 2021/22, when the CIT-to-GDP ratio decreased from 1.77% to 1.22% of GDP, or 0.55 percentage points. Figure 4.18 breaks down the fall in CIT declared between 2015/16 and 2021/22.

The Commercial Bank of Ethiopia reported the largest single decrease in CIT declared between 2015/16 and 2021/22, with a fall of 0.15pp (from 0.28% of GDP to 0.13% of GDP), based on its publicly available Annual Reports and Financial Statements. Other major contributors to the decline were manufacturing (0.22pp), wholesale/retail trade (0.19pp) and construction (0.08pp). The CIT-to-GDP ratio for all other sectors increased by 0.12pp.

Box 4.4 goes into more detail on the declining profitability of the Commercial Bank of Ethiopia, given it was the single largest contributor to the decline in the CIT-to-GDP ratio. The fall in CIT-to-GDP from other sectors is examined in more detail later in the section.

Figure 4.18. Breakdown of decline in CIT by firm/sector between 2015/16 and 2021/22



Note: 'All others' is the sum of the change in CIT-to-GDP between 2015/16 and 2021/22 for all other sectors not already listed. 'Discrepancy between microdata and aggregate' is an adjustment as 'CIT, 2015/16' and 'CIT, 2021/22' are the values in the official revenue reports, and the difference between the two values does not exactly align with the change in CIT declared in the balance sheet microdata. Data for CIT declared by the CBE is taken from publicly available Annual Reports and Financial Statements, available at https://www.combanketh.et/en/publications.

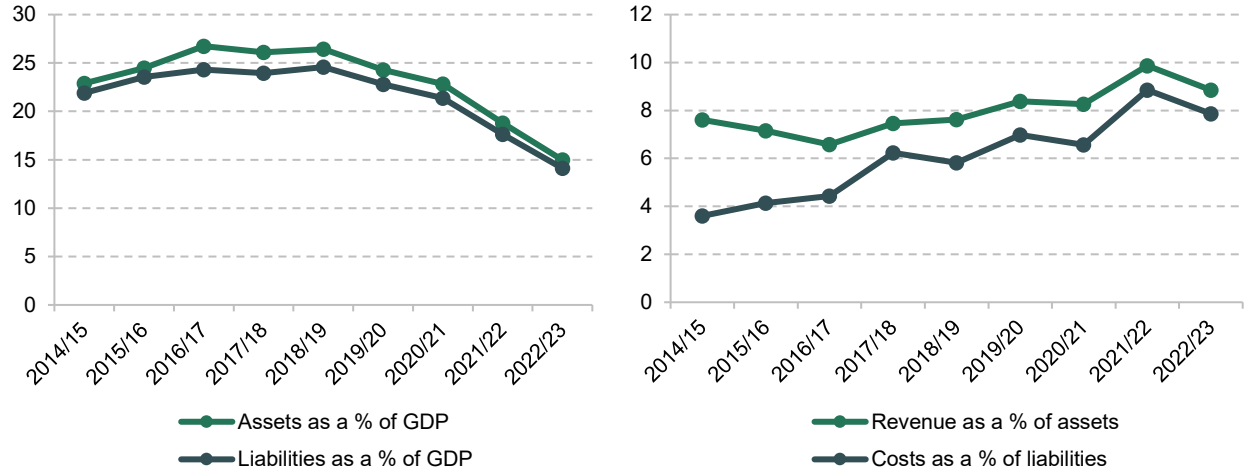
Source: Authors' calculations based on CIT balance sheet microdata from the Ministry of Revenue and aggregate CIT reporting from the Ministry of Revenue.

Box 4.4. The declining profitability of the Commercial Bank of Ethiopia

The Commercial Bank of Ethiopia (CBE) used to be an extremely profitable bank, at least on paper. Two standard measures of bank profitability are return on assets (or the ratio of pre-tax profit to assets) and return on equity (or the ratio of pre-tax profit to equity, where equity is a bank's assets minus its liabilities). The CBE's return on assets was 5.1% in 2014/15, compared with the median for low-income countries of 2.3% in 2014 (World Bank, 2022b), and its return on equity was 132.6% in 2014/15, compared with the median for low-income countries of 21.3% in 2014 (World Bank, 2022b). The CBE's return on assets and return on equity have since fallen to levels more typical of banks in lower-income countries. Its return on assets was 2.0% and its return on equity was 32.3% in 2021/22. The CBE's pre-tax profit as a percentage of GDP has correspondingly fallen from 0.95% in 2014/15, 0.35% in 2021/22.

A bank's profits-to-GDP can be expressed as its assets-to-GDP multiplied by the ratio of revenue to assets, minus its liabilities-to-GDP multiplied by the ratio of costs to liabilities.[49] These four terms – assets-to-GDP, liabilities-to-GDP, revenue-to-assets and costs-to-liabilities – are plotted in Figure 4.19.

Figure 4.19. Decomposing the decline in profitability of the Commercial Bank of Ethiopia



Note: 'Revenue' refers to interest income and non-interest income. 'Costs' refers to interest expense and non-interest expense, as well as 'impairment losses on financial instruments'.

Source: Authors' calculations based on Commercial Bank of Ethiopia Annual Reports and Financial Statements, available at https://www.combanketh.et/en/publications.

The decline in profit as a percentage of GDP has been driven by two factors. First, the CBE has become smaller relative to the Ethiopian economy: assets declined from 23% of GDP in 2014/15 to 15% of GDP in 2022/23, while liabilities declined from 22% to 14% of GDP. Second, although revenue (including interest and non-interest income) as a percentage of assets has slightly increased from 7.6% to 8.9%, costs (which include interest, non-interest expenses and impairment losses) as a percentage of liabilities have more than doubled from 3.6% to 7.9%. In other words, the bank has become smaller and its margins have become thinner.

Further examination of the Commercial Bank of Ethiopia is beyond the scope of this report, although it is worth noting that the CBE is heavily involved in financing investment by state-owned enterprises. Around 40% of the CBE's assets were bonds issued by Ethiopian Electric Power, Ethiopian Electric Utility and the Ethiopian Railways Corporation in 2015/16, the last year for which a breakdown is available. Chauffour and Gobezie (2019) and the World Bank (2022a) note that the CBE has historically limited the interest rate on savings in order to lend to state-owned enterprises on favourable terms, which can be described as financial repression. The extent of financial repression may have diminished due to the reduced financing needs of state-owned enterprises, given the general decline in public sector investment. At the same time, the market share of private banks increased during this period – CIT paid by the CBE as a share of the total

[49] Formally, Profits (as a share of GDP) = (Revenue/Assets) × (Assets/GDP) – (Costs/Liabilities) × (Liabilities/GDP).

CIT paid by the finance sector fell from 72% to 44%. Competition may have pressured the CBE to offer better returns on savings, leading to a higher cost-to-liability ratio.

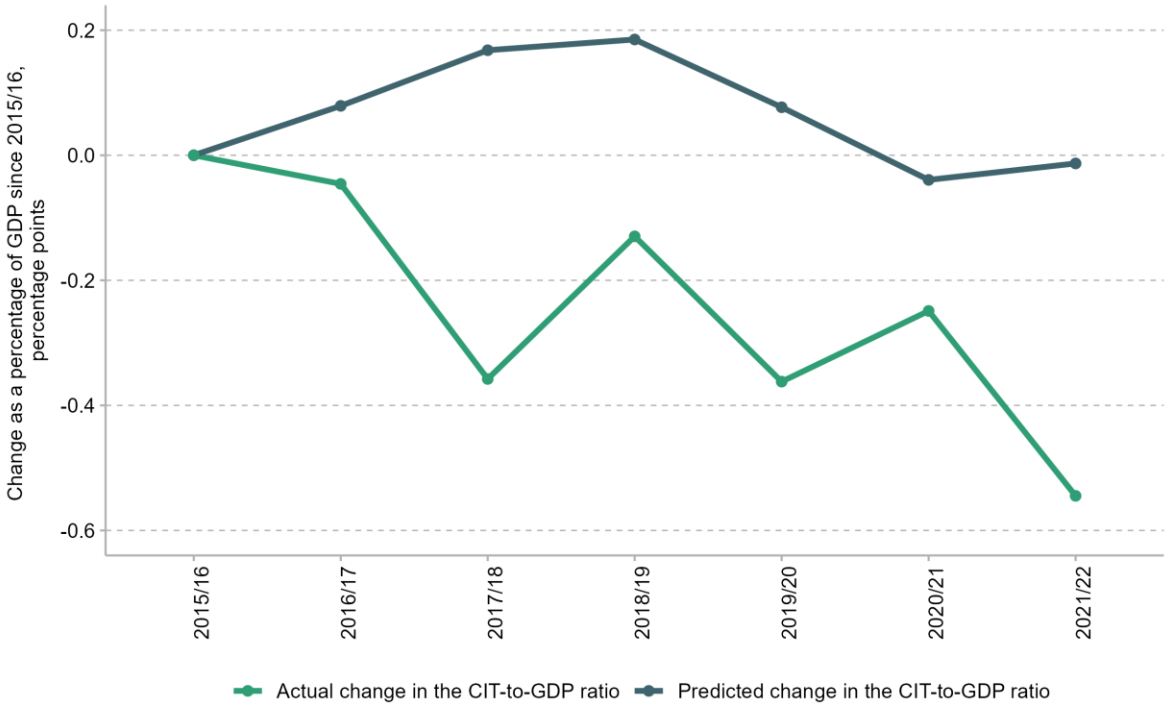
CIT performance analysis

The CIT-to-GDP ratio can fall either because the economy shifts away from sectors that pay a high effective CIT rate towards sectors that pay a low effective CIT rate, or if the effective CIT rate within each sector falls. CIT 'performance analysis' breaks down these two effects.

The dark grey line in Figure 4.20 is the predicted change in the CIT-to-GDP ratio if the effective CIT rate paid by each sector stayed the same as in 2015/16, where the effective CIT rate is defined as a sector's CIT revenues as a share of that sector's (national accounts measure of) value added. The green line is the actual change in the CIT-to-GDP ratio.

The fall in the CIT-to-GDP ratio cannot be explained by the economy moving away from high-taxed to low-taxed sectors. Whilst there has been some reorientation in the economy, the net effect on the predicted CIT-to-GDP ratio in 2021/22 was close to zero. However, the actual CIT-to-GDP ratio decreased by 0.55 percentage points.

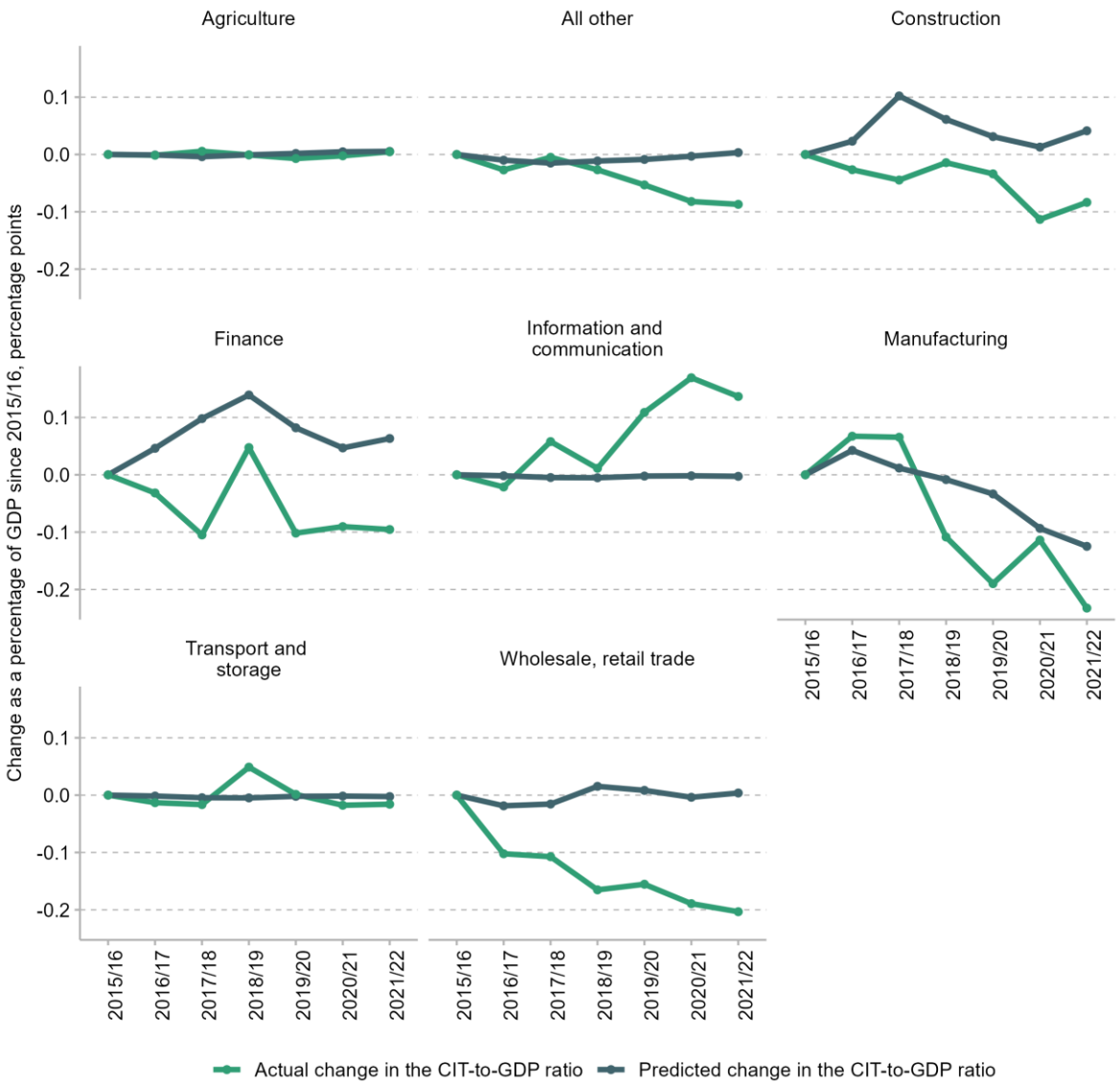
Figure 4.20. Actual and predicted changes in the CIT-to-GDP ratio



Note: Predicted change in the CIT-to-GDP ratio is equal to $\sum_s \left[ValueAdded_{s,t} \times {CIT_{s,2015}}/{ValueAdded_{s,2015}} \right] - CIT_{2015}$, where $CIT_{s,t}$ refers to the CIT-to-GDP ratio in sector *s* at time *t*.

Source: Authors' calculations based on corporate balance sheet microdata from the Ministry of Revenue and national accounts statistics from the Ministry of Planning and Economic Development.

Figure 4.21. Actual and predicted changes in the CIT-to-GDP ratio by sector



Note: Predicted change in the CIT-to-GDP ratio is equal to $ValueAdded_{s,t} \times {}^{CIT_{s,2015}}/_{ValueAdded_{s,2015}} - CIT_{s,2015}$, where $CIT_{s,t}$ refers to the CIT-to-GDP ratio in sector *s* at time *t*. Actual change in the CIT-to-GDP ratio is the sum of the changes in tax payable in corporate balance sheet microdata for a given sector.

Source: Authors' calculations based on corporate balance sheet microdata from the Ministry of Revenue and national accounts statistics from the Ministry of Planning and Economic Development.

The divergence between actual and predicted CIT-to-GDP is driven by the wholesale/retail, finance and construction sectors, as shown in Figure 4.21. For example, if CIT from the construction sector had grown with the (national accounts measure of) the sector's value added, CIT-to-GDP in the construction sector would be 0.04pp higher in 2021/22 than in 2015/16. However, actual CIT-to-GDP from the construction sector was 0.08pp lower. The gap – which we define as 'underperformance' – is therefore 0.12% of GDP. CIT underperformance in the finance sector and the wholesale/retail sector was 0.16% and 0.21% of GDP respectively in 2021/22. The CIT-to-GDP ratio in the manufacturing sector has also fallen, but this is more closely in line with the decrease in size of the manufacturing sector over this period, so underperformance was only 0.11% of GDP. Conversely, CIT-to-GDP has grown much faster in the information and communication sector than would be predicted based on the growth in value added of this sector.

Discussion: why did the CIT-to-GDP ratio fall?

Between 2015/16 and 2021/22, the CIT-to-GDP ratio fell by 0.55 percentage points. In line with the framework set out in Chapter 1, we now divide this into structural factors, policy factors and compliance-related factors.

There has not been a general shift from sectors that are highly taxed by the CIT to sectors that are low taxed by the CIT. As Figure 4.20 shows, if the effective CIT rate for each sector had stayed the same as in 2015/16, the CIT-to-GDP ratio would be roughly the same in 2021/22. Although (low-taxed) agriculture grew and (high-taxed) manufacturing shrank relative to GDP over this period, finance and real estate have also grown as a share of GDP. Unlike the VAT, finance and real estate paid a high effective CIT rate in 2015/16.

However, the 0.15 percentage point fall in the CIT-to-GDP ratio as a result of the falling profitability of the Commercial Bank of Ethiopia (CBE) is closest in definition to a 'structural factor', in the sense that it has happened for reasons largely out of the control of tax policy or tax administration. We assume that the entirety of the CIT underperformance in the finance sector – which is also about 0.15 percentage points – is because of the CBE. This is a generous assumption, as some of the fall in the profitability of the CBE will affect the total value added of the financial sector as recorded in the national accounts.

We allocate the remaining 0.4 percentage points of underperformance to 'compliance-related factors'. It is important to stress that underperformance here refers to CIT revenue in a given sector growing more slowly than the (national accounts measure of) value added in that sector. There are many reasons why underperformance can occur: labour costs and investment are generally deductible for CIT purposes but included in the national accounts definition of value added; an increasing share of production may be carried out by unincorporated firms; or policy changes

(such as tax holidays) may have reduced CIT revenue.[50] A more comprehensive CIT gap analysis (Ueda, 2018) can separate these effects, but the data required for such analysis are not available in Ethiopia. It may also be the case that the value added of each sector has not been measured correctly in the national accounts. However, given that the sectors with the highest CIT underperformance (wholesale/retail trade and construction) are also the sectors with high and growing VAT compliance gaps (see Figure 4.9), it is likely that non-compliance is at least one of the factors driving CIT underperformance in these sectors.

The CIT-to-GDP ratio fell by a further 0.2 percentage points between 2021/22 and 2022/23. As the microdata – and therefore the data on the revenue contributed by each sector – are only available up until 2021/22, we do not allocate this fall to either structural, policy or compliance-related factors.

[50] However, we are not aware of any changes to CIT policy that can explain this underperformance. Tax holidays did not change over this period: they were introduced in 2012 (Regulation No. 270/2012) and reformed in 2022 (Regulation No. 517/2022). The sectors with the largest underperformance – wholesale/retail and construction – are generally not eligible to claim a tax holiday. It also seems unlikely that labour costs have increased relative to non-labour costs for corporates. The analysis in the next section shows that formal sector earnings – as measured by the Urban Employment Unemployment Survey – have fallen significantly behind nominal GDP.

4.4 Employment income tax

Key findings

1. Employment income tax fell from 1.61% of GDP in 2015/16 to 1.24% of GDP in 2022/23, accounting for 8% of the total fall in the tax-to-GDP ratio over the period.

2. This fall appears to be because formal sector employment earnings – as measured by the Ethiopian Urban Employment Unemployment Survey – grew much more slowly than nominal GDP.

3. The net effect of tax policy on the EIT-to-GDP ratio over the period was close to zero. Tax thresholds were raised in 2016/17, leading to a sharp reduction in the average tax rate, but were subsequently frozen in nominal terms, leading to an increase in the average tax rate that offset the initial reduction.

Employment income tax (EIT) is one component of Ethiopia's personal income tax (PIT) system. EIT is levied on employees' earnings and collected via the pay-as-you-earn (PAYE) regime. The federal government collects EIT on the earnings of employees of the federal government and international organisations, and regional governments collect EIT on the earnings of other employees. The other components of the PIT system are personal business income tax (PBIT), rental income tax, taxes on dividends and taxes on lottery winnings. These are not examined in detail as collectively they only account for 0.16 percentage points of the fall in the tax-to-GDP ratio, compared with 0.36 percentage points accounted for by EIT.

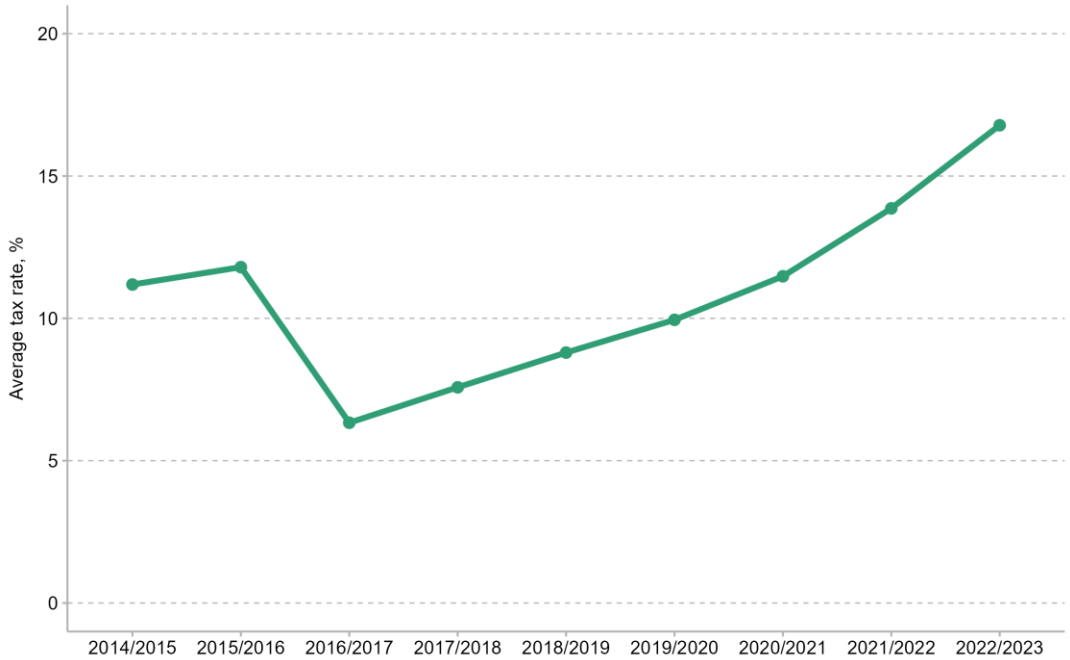
The fall in the EIT-to-GDP ratio is particularly striking given that income tax thresholds have been frozen since 2016/17, when they were last revised up. In a context of high nominal earnings growth, a freeze in tax thresholds means that average tax rates increase over time, as more and more taxpayers cross tax thresholds and a larger fraction of income is taxed at higher rates – a process known as fiscal drag. In 2015/16, an individual whose employment earnings were equivalent to nominal GDP per capita in that year would pay an average tax rate of 11.8%, as shown in Figure 4.22. This is a rough measure of the tax burden of EIT on relatively 'middle' earners.[51] The reform of thresholds in 2016/17 led to a sharp reduction in the average rate to 6.3% in 2016/17, but high nominal GDP growth, with tax thresholds frozen in nominal terms, has since

[51] A comparison of this measure across countries is shown in Figure 3.2.

meant that the average rate faced by someone earning an amount equivalent to GDP per capita has risen rapidly, surpassing its 2015/16 value in 2021/22 and rising to 16.8% in 2022/23.

If earnings subject to tax had increased in line with GDP, we would have therefore expected an increase in the EIT-to-GDP ratio, but instead we have seen a decrease. So other factors must have more than offset the fiscal drag due to frozen tax thresholds. Such factors could include a reduction in employment, a significant fall in nominal earnings relative to reported nominal GDP, and/or an increase in informality and tax non-compliance. To examine the potential role of these different factors, we make use of data from four waves (2015, 2016, 2018 and 2022) of the Ethiopian Urban Employment Unemployment Survey (UEUS), which includes information on employment, formality status and wages. Ideally this would be complemented by analysis of taxpayer-level EIT data from the Ministry of Revenue and regional revenue authorities, but unfortunately such data are not readily available.[52] Findings must therefore be treated with a degree of caution.

Figure 4.22. Average tax rate on an individual earning the equivalent of nominal GDP per capita

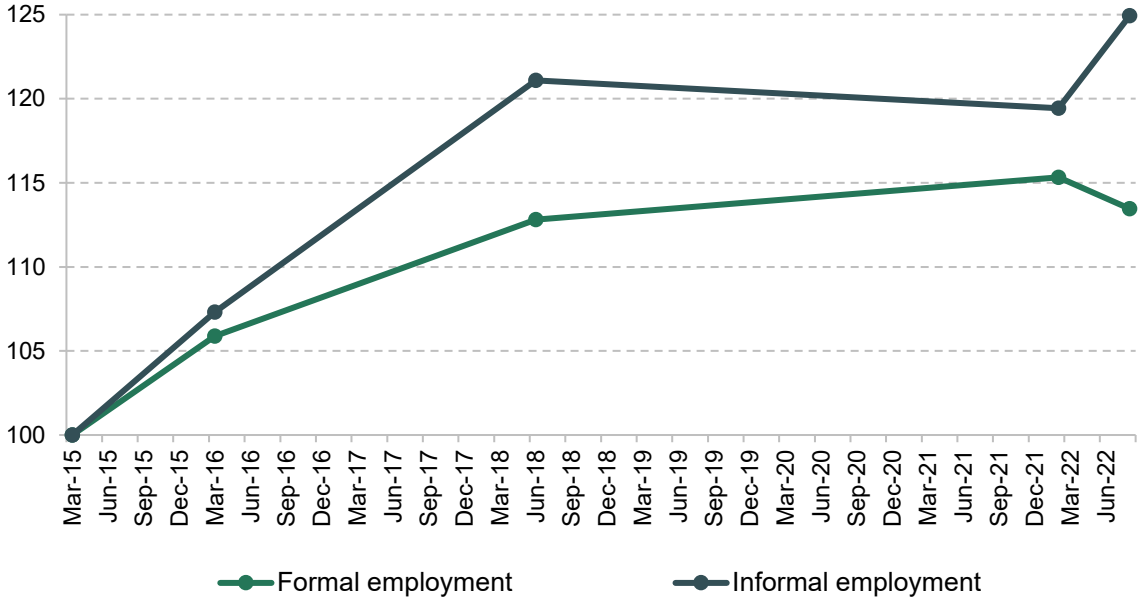


Note: The average tax rate is the total tax paid as a share of an individual's pre-tax income, assuming that the entirety of an individual's income is classified as employment income and that employment income is equivalent to GDP per capita in that year.

Source: Authors' calculations based on GDP per capita from the Ministry of Planning and Economic Development.

[52] MoR data are aggregated at the employer level; regional data are not available centrally.

Figure 4.23. Employment by formal and informal sector



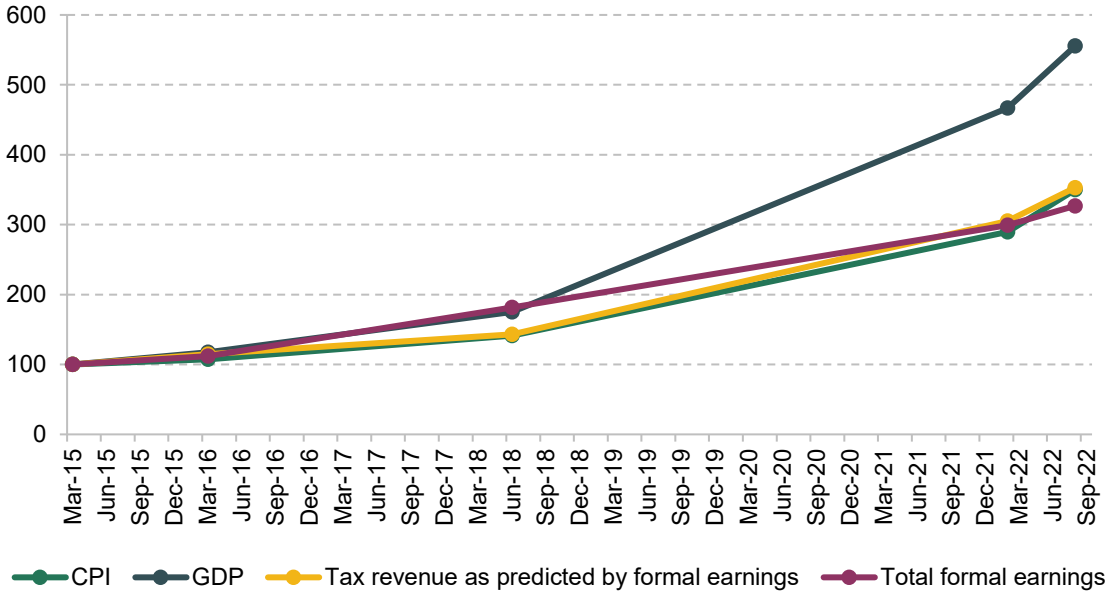
Source: Authors' computation using the Ethiopian Urban Employment Unemployment Survey.

Bearing this in mind, Figure 4.23 shows the estimated number of employees, separately for the formal and informal sectors, for each wave of the survey. It shows that employment in the formal sector grew at an annual average rate of around 3.8% between the March 2015 survey and the June 2018 survey – a total increase of around 12.8%. Employment in the informal sector grew approximately 1.6 times as fast (21.1% in total over this period). However, employment in both the formal and informal sectors stagnated between June 2018 and August 2022, growing by just 0.6% and 3.2%, respectively, over this four-year period (although informal employment appeared to grow sharply between the February and August 2022 waves).

Figure 4.24 shows trends in aggregate earnings and implied tax revenues, consumer prices and nominal GDP over the period between March 2015 and August 2022.[53] It shows that whereas reported earnings outpaced both consumer prices and (slightly) nominal GDP between the 2015 and 2018 waves of the UEUS, earnings significantly lagged the change in consumer prices and nominal GDP between the 2018 and 2022 waves. This means aggregate reported earnings increased by a factor of 3.3-fold between the March 2015 wave of the survey and the August 2022 wave, whereas nominal GDP grew by a factor of 5.6.

[53] We approximate nominal GDP for a given month using a geometric weighted mean of the fiscal year the month falls in and either the prior fiscal year (for July to December) or subsequent fiscal year (for January to June). For example, the nominal GDP for August 2022 is proxied as the geometric weighted mean of GDP in 2021/22 and 2022/23, where the weights are 4.5/12 and 7.5/12, respectively, for these two years.

Figure 4.24. Comparison of earnings, CPI and GDP, March 2015 = 100



Note: Annu4l GDP is converted to a monthly equivalent (see footnote 56 for details).

Source: Authors' computation using Ethiopian Urban Employment Unemployment Survey, and data from the Ministry of Planning and Economic Development, the National Bank of Ethiopia and the Ethiopian Statistical Service.

Based on the distribution and the change in earnings in the UEUS, it is possible to predict the change in tax revenue (the yellow line in Figure 4.24). Between the March 2015 and August 2022 waves, predicted tax revenue increased by a factor of 3.5, which is very close to the increase in total formal earnings (a factor of 3.3). This suggests that the 'net' effect of tax policy over this period was small – between March 2015 and June 2018, formal earnings increased faster than tax revenues because of the increase in tax thresholds in 2016/17, but this was somewhat offset as fiscal drag led to average tax rates increasing between June 2018 and August 2022.

As a result of the slowdown in earnings relative to GDP, implied tax revenue as a percentage of GDP, or the implied EIT-to-GDP ratio, fell by one-third between the March 2015 and February 2022 waves, which is in fact larger than the fall of roughly one-fifth that actually took place. Estimates based on the Urban Employment Unemployment Survey therefore overstate the fall in the EIT-to-GDP ratio seen. But they do strongly suggest that a fall in aggregate earnings relative to both prices and nominal GDP since 2018 likely plays a significant part in explaining the falling EIT-to-GDP ratio seen in spite of frozen tax thresholds. The data on employment levels suggest this partly reflects a stagnation in employment (in both the formal and informal sectors), but that a slowdown in earnings per worker is a bigger factor.

Why have formal earnings performed so poorly relative to nominal GDP? It is not possible to give a definitive answer, but there are some clues. The slowdown largely took place between the June

2018 and February 2022 waves of the survey and so may have been affected by the numerous shocks facing Ethiopia over this period, including COVID-19, the conflict and their associated effects.[54] Analysis by employer type shows that the slowdown in employment and earnings growth since 2018 was concentrated in the public sector (including state-owned enterprises). Between the March 2015 and June 2018 waves, the public sector drove the overall growth in formal employment. Formal public sector employment, which refers to employment in government and state-owned enterprises, grew at an annual rate of 5.3% a year, while formal private sector employment grew at an annual rate of 1.7% a year. Between the June 2018 and August 2022 waves, formal public sector employment only grew by 1.4% a year, while formal private sector employment fell by 1.8% a year. The slowdown in average wage growth is also more pronounced in the public sector: between March 2015 and June 2018, average wages for formal employees grew at an annual rate of 15% in both the public and private sectors. Between the June 2018 and August 2022 waves, average wages grew by 19% per year in the private sector but by only 13% per year in the public sector. This may, in part, be linked to the freezing of civil service salary scales since 2019.

Discussion: why did the EIT-to-GDP ratio fall?

Turning to the framework set out in Chapter 1, the reasons for the 0.36 percentage point fall in the EIT-to-GDP ratio are closest in definition to a 'structural factor'. The EIT-to-GDP ratio appears to have fallen because the potential tax base of the EIT – earnings by formal employees – has grown substantially more slowly than nominal GDP between 2015 and 2022, at least based on survey evidence from the Urban Employment Unemployment Survey (UEUS). Given that the slowdown in earnings was more pronounced for government and state-owned enterprise employees, this may be linked to the general fall in public sector investment and the freezing of civil service salary scales, or to recent shocks such as COVID-19 and the conflict. The 'net' effect of tax policy over this period was close to zero, as the rise in income tax thresholds in 2016/17 was roughly cancelled out by nominal freezes in subsequent years.

The fall in the EIT-to-GDP ratio as predicted by employment earnings in the UEUS is much larger than the actual fall in the EIT-to-GDP ratio. This may be an issue with the survey: it is well known that these types of household surveys do not fully capture the earnings of very high earners, as they are more likely to not respond or to understate their income (Webber, Tonkin and Shine, 2020). In Ethiopia, the earnings of very high earners may have performed relatively well compared with others, propping up the EIT-to-GDP ratio, though we cannot confirm this based on the

[54] Falls in employment during the pandemic were widely reported (e.g. Hardy et al., 2024; https://www.thereporterethiopia.com/9937/), with conflict (and associated changes to Ethiopia's trading arrangement with the US) identified as negatively affecting production and employment in areas directly affected by conflict (e.g. https://www.voanews.com/a/ethiopia-s-industrial-hopes-dwindle-as-conflict-sanctions-take-toll/6739509.html).

available data. There may also have been further issues specific to the UEUS, such as inconsistencies in sampling. It could also be the case that tax compliance has improved.

5. Issues that may have affected the tax-to-GDP ratio across taxes

This chapter examines two general issues that may have affected all tax instruments: the role of the conflict in Tigray (Section 5.1) and the possibility that GDP growth has been overestimated (Section 5.2).

5.1 Conflict

Key findings

1. Conflict – including conflict in other regions before and during the Tigray conflict – is likely to be one of the factors contributing to the 'structural factors' identified in Chapter 2. We do not estimate the extent to which the conflict has contributed to these structural factors.

2. We estimate the 'narrow' revenue impact of the Tigray conflict on the tax-to-GDP ratio to be around 0.25 percentage points. By this we mean the impact of the Tigray conflict through its effect on tax collected by the Tigrayan regional government and the federal government in Tigray, and tax paid by the companies based outside Tigray with a high exposure to Tigray.

Ethiopia has experienced significant insecurity and a series of internal conflicts in recent years, the most notable of which was the conflict in Tigray. The conflict in Tigray began on 4 November 2020 and a cessation of hostilities was signed on 2 November 2022.[55] The bulk of the fighting took place within the Tigray region, though there were spillovers to parts of the Amhara and Afar

[55] https://www.aljazeera.com/news/2022/11/10/two-years-of-ethiopias-tigray-conflict-a-timeline.

regions between July and December 2021.[56] During the conflict, control of the Tigrayan capital of Mekelle alternated between federal and TPLF forces. Since August 2023, there has also been fighting between federal government forces and Amhara militias in some parts of the Amhara region. Insecurity in other regions of Ethiopia, especially in the Oromia region, has been ongoing since 2018.

Conflict – including conflict in other regions before, during and after the 2020–22 Tigray conflict – has been widely acknowledged to have been deeply damaging to Ethiopia's economy. According to the Government of Ethiopia's own estimates, the physical damage to property and infrastructure caused by the conflict just between November 2020 and December 2021 was equivalent to 20% of Ethiopia's GDP in FY 2020/21 (Government of Ethiopia, 2022). The conflict has also indirectly affected areas that did not see any fighting. For example, the conflict led to the US suspending Ethiopia from AGOA (the African Growth and Opportunity Act) in 2022,[57] which permitted tariff-free access for certain goods to the US market. This has led to mass layoffs in Ethiopia's emerging textiles industry (Mulat, 2024). The conflict has also been linked to high levels of inflation,[58] diminished agricultural production (Oxford Initiative on Peace and Recovery in Ethiopia, 2022), foreign exchange issues[59] and falling foreign investment,[60] amongst a host of other factors. Researchers from Oxford University estimate that by 2027, the Ethiopian economy will be 19% smaller than if pre-conflict trends had continued (Oxford Initiative on Peace and Recovery in Ethiopia, 2022).

Estimating the total impact of conflict, including its wider economic impacts, on Ethiopia's tax-to-GDP ratio is difficult, if not impossible. We simply do not know what would have happened in Ethiopia in the absence of the conflict. For example, some have linked Ethiopia's foreign exchange problems to the Tigray conflict, and these in turn have affected import tax revenues. But if the conflict had not occurred, Ethiopia would likely still be facing foreign exchange shortages, which are closely linked to an investment boom that pre-dated the Tigray conflict (World Bank, 2022a).

56 Ibid.

57 https://ustr.gov/about-us/policy-offices/press-office/press-releases/2022/january/us-terminates-agoa-trade-preference-program-ethiopia-mali-and-guinea#:%7E:text=U.S.%20Terminates%20AGOA%20Trade%20Preference%20Program%20for%20Ethiopia%2C%20Mali%20and%20Guinea,-January%2001%2C%202022&text=WASHINGTON%20%E2%80%93%20The%20United%20States%20today,violation%20of%20the%20AGOA%20Statute; https://www.aljazeera.com/news/2022/1/2/us-removes-ethiopia-mali-and-guinea-from-agoa-trade-programme.

58 https://www.thenewhumanitarian.org/news-feature/2023/08/01/boom-bust-fallout-war-and-drought-leaves-ethiopians-mired-poverty.

59 https://www.bbc.co.uk/news/world-africa-58319977#:~:text=Pressure%20to%20end%20war&text=The%20country%20imports%20about%20%2414,or%20nearly%2070%25%20of%20GDP.

60 Ibid.

It is worth noting that conflict could in general be expected to affect both tax collection and GDP, leaving the overall effect ambiguous.

This section focuses on estimating the 'narrow' impact of the conflict on the tax-to-GDP ratio, by which we mean the impact of the Tigray conflict through its effect on tax collected by the Tigrayan regional government and by the federal government in Tigray, and tax paid by the companies based outside Tigray with a high exposure to Tigray. Beyond this 'narrow' impact, the conflict is likely to have affected the tax-to-GDP ratio through its effect on GDP, and some of the 'macroeconomic' shifts discussed in previous sections may also be linked to the conflict. To the extent that the conflict affected governance and the social fabric of Ethiopia (Oxford Initiative on Peace and Recovery in Ethiopia, 2022), it may also explain some of the increase in non-compliance. We focus on the Tigray conflict, as the conflict in Oromia and other regions has been characterised by a lower level of intensity[61] and, as such, it is harder to detect its impact on the overall tax-to-GDP ratio. The recent conflict in Amhara is not considered as it took place after the end of fiscal year 2022/23.

For all three tax types considered, we estimate the impact of the conflict on tax collected as the change in tax revenues between 2019/20 (before the conflict) and 2021/22. We directly observe tax collections by the Tigrayan regional government and the federal government in Tigray. We proxy the tax paid by companies based outside Tigray with high exposure to Tigray using the change in tax paid by companies in the 'EFFORT' portfolio of Tigray-linked state-owned companies that we can identify in the tax data.

By this method, we estimate that the 'narrow' revenue impact of the Tigrayan conflict is a 0.25 percentage point reduction in the tax-to-GDP ratio, equivalent to 3% of Ethiopia's total tax take. While we do not want to understate the damage that the conflict has done to Tigray and surrounding regions and the human suffering that it has caused, this relatively small fiscal impact is in line with expectations, given that Tigray only accounts for around 5% of Ethiopia's population.[62]

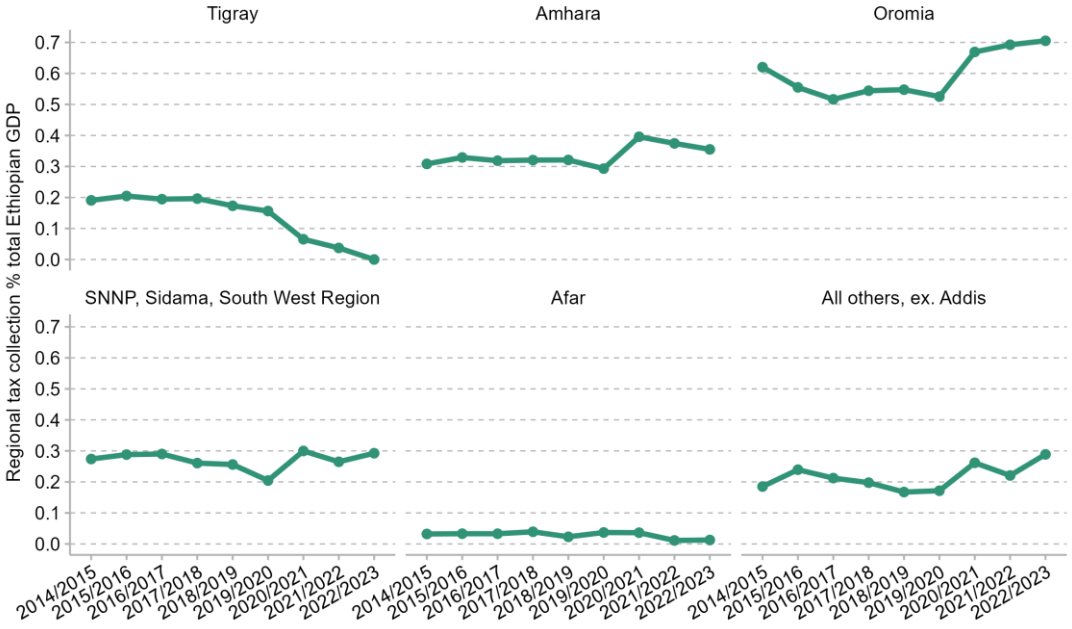
The first component of the 'narrow' revenue impact of the Tigrayan conflict on the tax-to-GDP ratio is its effect on Tigray regional government tax collection. Regional governments are responsible for collecting employment income tax, business income tax and VAT from unincorporated businesses, land-use fees, and a range of smaller taxes and fees. Figure 5.1 presents regional government tax collection as a share of GDP for selected regional governments.

[61] https://www.thenewhumanitarian.org/news-feature/2023/01/12/Ethiopia-Oromia-conflict-OLA.

[62] https://www.statsethiopia.gov.et/wp-content/uploads/2023/08/Population-of-Zones-and-Weredas-Projected-as-of-July-2023.pdf.

In 2019/20, tax collection by the Tigray regional government accounted for 0.16% of Ethiopia's GDP. During the conflict, this figure decreased to 0.07% in 2020/21 and 0.04% in 2021/22, but did not fall to zero, possibly due to periodic federal government control of Mekelle and parts of Tigray. In 2022/23, no revenue was reported by the Tigrayan regional government. Tax collection by the Afar regional government also fell, from 0.04% of GDP in 2020/21 to 0.01% in 2021/22 and 2022/23, and tax collection by the Amhara regional government fell from 0.40% of GDP in 2020/21 to 0.37% in 2021/22 and 0.36% in 2022/23, which may be linked to the conflict spilling over to those regions. Tax collections by other regional governments were broadly stable or increasing.

Figure 5.1. Tax collections by regional governments

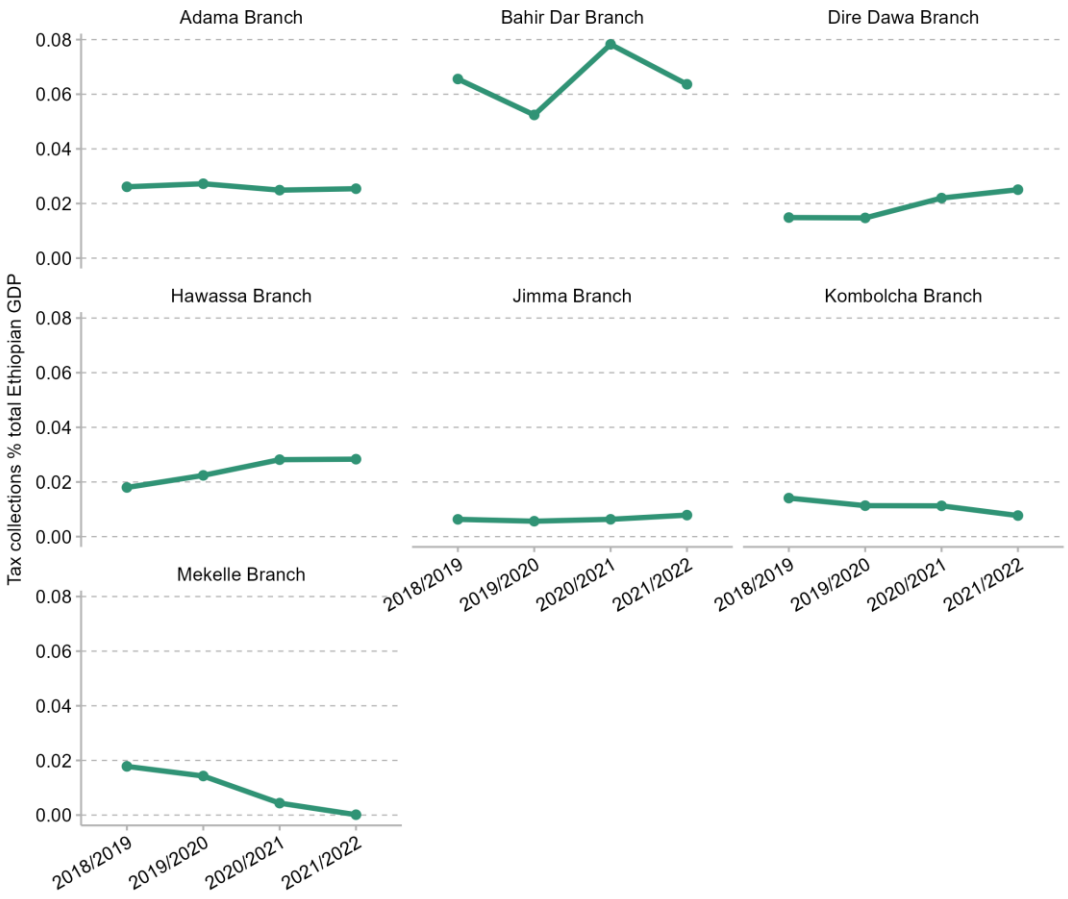


Note: Addis Ababa is not shown, as Addis revenue follows different trends. SNNP = Southern Nations, Nationalities and Peoples.

Source: Ministry of Revenue regional tax collection data.

The second component of the 'narrow' revenue impact of the Tigrayan conflict on the tax-to-GDP ratio is its effect on tax collected by the federal government in Tigray. The federal Ministry of Revenue has a number of regional branch offices to collect tax from incorporated businesses based in regional centres. Figure 5.2 shows collections of VAT, CIT, turnover tax, excises and withholding taxes in selected regional branch offices between 2018/19 and 2021/22 (when these data are available). Tax collections by the federal Ministry of Revenue in the Mekelle branch office fell from 0.02% of (total Ethiopian) GDP in 2018/19 to close to 0% in 2021/22. Tax collections in other branches were stable or increasing (except in the Kombolcha tax office in Amhara region, where tax collection was plausibly also affected by the Tigray conflict).

Figure 5.2. Tax collections by the federal government in regional branch offices



Note: Collections from the LTO, MTO, Addis Ababa branches or the Northwest Small Taxpayers Office are not shown, as tax collections from these branches are substantially higher. Mekelle is the only Ministry of Revenue branch in the Tigray region. Data are only available from 2018/19 to 2021/22.

Source: Ministry of Revenue tax payment data.

The third component of the 'narrow' revenue impact of the Tigrayan conflict on the tax-to-GDP ratio is its effect on tax paid by companies based outside Tigray with a high exposure to Tigray. We proxy the tax paid by such companies using the tax paid by companies in the 'EFFORT' (Endowment Fund for the Rehabilitation of Tigray) portfolio, a group of state-owned enterprises primarily registered for tax in Addis but with significant operations in Tigray. VAT and CIT paid by EFFORT firms listed in Vaughan and Gebremichael (2011) that are observable in the tax microdata and registered for tax outside Mekelle was 0.06% of GDP in 2019/20, which declined to close to 0% of GDP in 2021/22. As there are likely many other companies outside the EFFORT portfolio that were exposed to the Tigrayan conflict, looking at the EFFORT group gives us a lower-bound estimate of the true impact of the conflict on companies based outside Tigray that have operations in Tigray.

Discussion: the effect of conflict on the tax-to-GDP ratio

In this section, we have estimated the 'narrow' impact of the recent conflict in Tigray on the tax-to-GDP ratio, which we define as the impact of the Tigray conflict through its effect on tax collected by the Tigrayan regional government and the federal government in Tigray, and tax paid by the companies based outside Tigray with a high exposure to Tigray. Our best estimate of the narrow impact is 0.25 percentage points. This impact is in line with the region's small population relative to the rest of Ethiopia.

However, conflict – including conflict in other regions prior and during the Tigray conflict – has clearly had a wider economic impact. It is likely to have affected GDP and thus the denominator of the tax-to-GDP ratio. It may also have contributed to the structural factors that have affected the tax-to-GDP ratio, such as falling imports and public investment.

5.2 Role of the denominator: has GDP growth been overstated?

Key findings

1. A final possible reason for a falling tax-to-GDP ratio is that GDP growth in recent years may have been overstated.

2. Ethiopia's reported GDP growth since the mid-2000s has been exceptionally fast by regional and global standards. At least since the mid-2010s, this fast growth is not reflected in two alternative measures of economic activity: earnings in the Urban Employment Unemployment Survey and the intensity of nighttime lights as measured from space (night lights).

3. Between 2015/16 and 2022/23, reported real GDP growth was 60%, while GDP growth as predicted by (adjusted) night lights was only 28%, and real earnings in the UEUS marginally decreased over this period. In contrast, a third proxy measure of economic activity, aggregate consumption in the Ethiopia Socioeconomic Survey, is broadly consistent with the fast growth in consumption and output recorded in the national accounts.

4. Taken as a whole, no firm conclusion can be drawn from these proxy measures regarding the potential overstatement of Ethiopian economic growth. All alternative indicators of economic activity available have serious shortcomings. We therefore take official GDP data as given in the rest of this report.

A final possible reason for a low tax-to-GDP ratio is that GDP – the denominator – is overstated. For instance, if GDP was in fact 10% lower than officially measured, the true tax-to-GDP ratio in 2022/23 would be 8.3% rather than the official 7.5%. If GDP had become increasingly overstated in recent years – in other words, if GDP *growth* had been overstated – this could also explain (part of) the decline in the tax-to-GDP ratio.

There are many reasons why GDP or GDP growth may have been overstated. The process of GDP measurement is difficult in a country such as Ethiopia with a large agricultural sector and a large informal sector, so GDP (growth) may simply have been inaccurately measured. More

problematically, there may have been political pressure to make statistical choices that boosted measured GDP, or outright data manipulation.

For the purposes of this project, we do not evaluate whether the measurement of GDP in Ethiopia is in line with international best practice. Instead, in this section, we compare Ethiopia's recent GDP growth with GDP growth in other countries. We then compare official GDP growth with three alternative measures of economic growth – namely, earnings growth from the Urban Employment Unemployment Survey, the growth in night lights as measured by a satellite, and aggregate consumption growth from the Ethiopia Socioeconomic Survey.

In making these comparisons, we focus on *real* GDP growth, as nominal GDP growth is not comparable across countries and cannot be proxied by the growth in night lights. However, it is nominal GDP that matters for the tax-to-GDP ratio, as the GDP measure in its denominator is nominal GDP. Therefore, the focus on real GDP is only justified if any mismeasurement of nominal GDP would also be reflected in mismeasured real GDP. This is plausible if we can be reasonably sure that the difference between nominal and real GDP – the GDP deflator – is measured accurately.

The only other measure of inflation available in Ethiopia is the Consumer Price Index (CPI). Although the GDP deflator and CPI are two separate measures of prices, they would be expected to move together in the long run. Figure B.8 in Appendix B shows that they do indeed move together in the long run, meaning we can be more confident that the GDP deflator is accurate, and any mismeasurement of real GDP is informative for mismeasurement of nominal GDP.

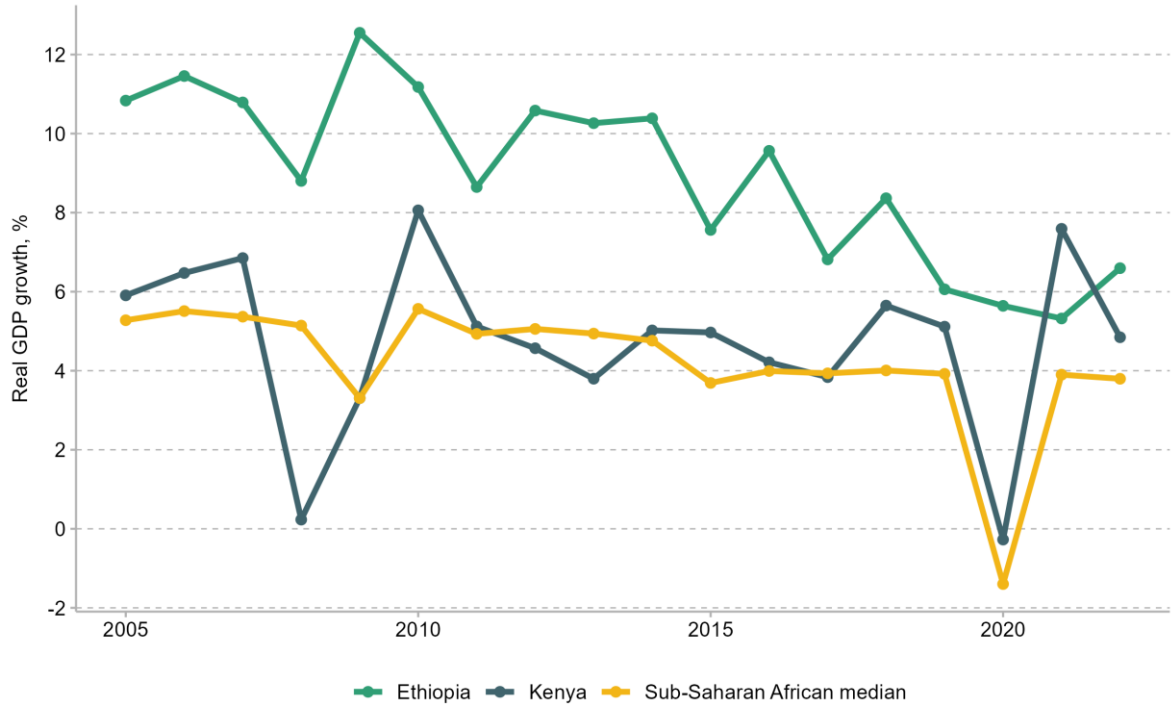
Comparing Ethiopia's real GDP growth with that of regional peers

Figure 5.3 compares Ethiopia's measured real GDP growth over the last two decades with growth in Kenya, and the median for other sub-Saharan African countries. From the mid-2000s to the late 2010s, measured economic growth in Ethiopia was exceptionally fast relative to that in Kenya and other sub-Saharan African countries. Between 2005 and 2016, measured growth in Ethiopia never fell below 7.5%. Recent growth estimates are somewhat lower, but notably 2020 growth was still above 5%, when growth in peer countries dipped significantly, presumably due to COVID-related disruption. Ethiopia's most recent growth readings of 5.3% in FY 2021/22 and 6.6% in 2022/23 have still been strong despite the disruption caused by the Tigray conflict.

The much higher growth in Ethiopia than in other countries does further raise suspicions on whether GDP growth has been overstated. However, it is worth noting that Ethiopia's growth rate was very high in the decade leading up to 2014, while the tax-to-GDP ratio was rising or stable. This is by no means proof that GDP overestimation played no role in the recent fall of the tax-to-GDP ratio: it is perfectly possible that GDP growth was measured accurately in those years but is

overstated now. But it is still notable that very fast measured GDP growth in Ethiopia has historically been compatible with a rising or constant tax-to-GDP ratio.

Figure 5.3. Comparing GDP growth in Ethiopia and in its regional peers



Note: Value for Ethiopia is at the fiscal-year level, such that 2020 refers to FY 2020/21.

Source: Ethiopia – Ministry of Planning and Development. Kenya and sub-Saharan African median – World Bank (2023b).

Alternative measures of economic activity

We now turn to three alternative measures of economic activity: earnings growth from the Urban Employment Unemployment Survey (UEUS), the growth in night lights as measured by a satellite, and aggregate consumption growth from the Ethiopia Socioeconomic Survey (ESS). Both survey measures and night lights measured from space have been widely used in the economic literature as proxy measures of GDP (Henderson, Storeygard and Weil, 2012; Pinkovskiy and Sala-i-Martin, 2016; Hu and Yao, 2022). All have been found to be useful but generally more noisy than recorded GDP.

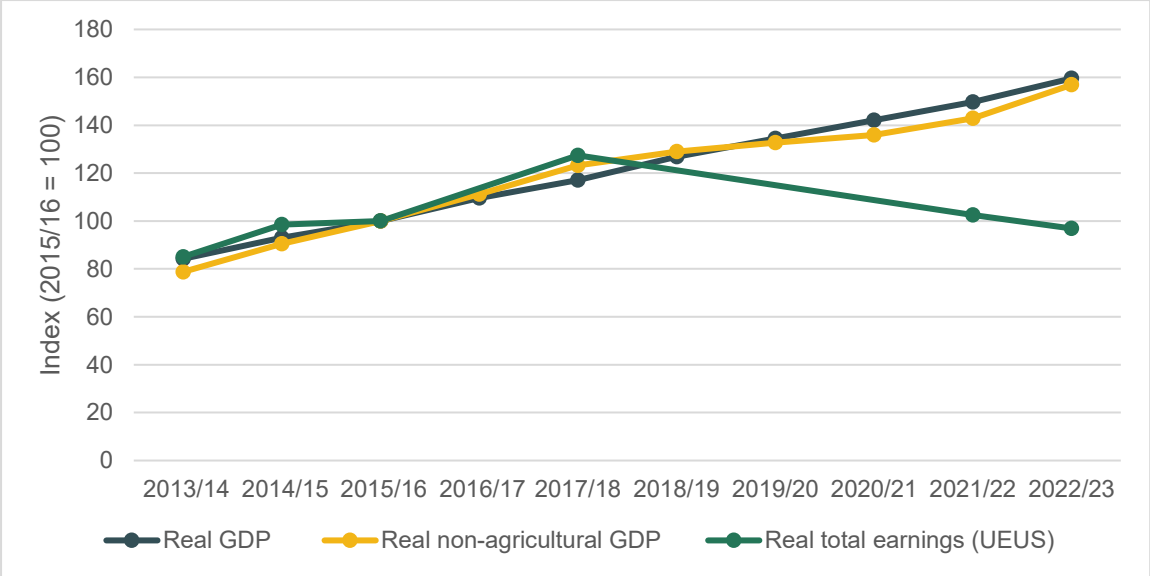
Figure 5.4 compares total earnings from the UEUS with recorded GDP and non-agricultural GDP.[63] Total earnings are the sum of earnings from employment and self-employment in the

[63] Both total earnings (UEUS) and non-agricultural GDP have been deflated using the overall GDP deflator for comparability.

formal and informal sectors for the urban population (around 20% of Ethiopia's total population). In 2015/16, the estimated total earnings of this population based on the UEUS accounted for around 6% of recorded GDP. This is likely a substantial underestimate. Informal earnings in particular are especially likely to be undercounted, as they implausibly only account for less than 10% of total earnings in the UEUS data.

Estimated total earnings evolved roughly in line with recorded GDP between 2015/16 and 2017/18, but the two latest waves of the UEUS tell a very different story. These two latest data points have real total earnings falling back to their real level in 2015/16, rather than continuing to grow in line with recorded GDP growth. The resulting difference is very large: while recorded real GDP was 60% larger in 2022/23 than it was in 2015/16, real total earnings were 3% lower. The results are nearly identical if we instead compare real total earnings with recorded non-agricultural GDP, which one might have expected to be more closely aligned with urban earnings.

Figure 5.4. Comparing total earnings from the Urban Employment Unemployment Survey with GDP



Note: Both total earnings (UEUS) and non-agricultural GDP have been deflated using the overall GDP deflator for comparability. Total earnings are the sum of earnings from employment and self-employment in the formal and informal sectors for the total urban population. UEUS waves were in the field in April 2014, March 2015, March 2016, June 2018, January 2020, February 2022 and August 2022. We were unable to access January 2020 data. As the June 2018 and August 2022 waves fall roughly in between two fiscal years, we deflate them using the simple average between the deflators for the two adjacent fiscal years. The remaining waves are deflated using the deflators for the fiscal years in which they fall.

Source: Urban Employment Unemployment Survey; Ministry of Planning and Development; authors' calculations.

It is important not to overinterpret these two final data points. It is perfectly possible that the earnings of urban employees might have followed a very different trend from the rest of the economy, as they only make up a small share of Ethiopian GDP. Around half of all formal

employees represented in the UEUS were government employees (37% in 2015/16, rising to 58% in 2022/23) and, as discussed above, civil servants' salary scales have been frozen in nominal terms since the 2019/20 fiscal year. In contrast to previous waves, the 2022/23 wave of the survey was conducted during the Ethiopian rainy season, when earnings may have been seasonally lower.

Nonetheless, these findings lend further credibility to the hypothesis that recent Ethiopian GDP growth – especially since 2017/18 – might be overstated. While it is no surprise that the Urban Employment Unemployment Survey has not tracked recorded GDP closely, the sheer scale of the divergence is striking.

The second alternative measure of growth in economic activity that we consider is growth in night lights as measured by satellites. Night lights are well correlated with economic activity in the cross-section: rich countries look much brighter from space than poor countries. Based on this finding, a large literature in economics starting with Henderson et al. (2012) has proposed to use night lights to measure economic growth.

Unfortunately, consistently measuring night lights over time is a very difficult task. Due to cloud cover, night lights from only part of the earth's surface are observable in any given night. Solar illumination toward the poles during the respective summer months also means that no values are available for part of each year for non-tropical regions – although fortunately this is not a problem in Ethiopia's case.[64] In Ethiopia, the most important difficulty is likely background radiation in low-lit areas: for a large and relatively low-lit country such as Ethiopia, measured background radiation can be a substantial component of total measured night lights. Finally, satellite sensors degrade over time and periodically require recalibration, which can limit the comparability of measurements.

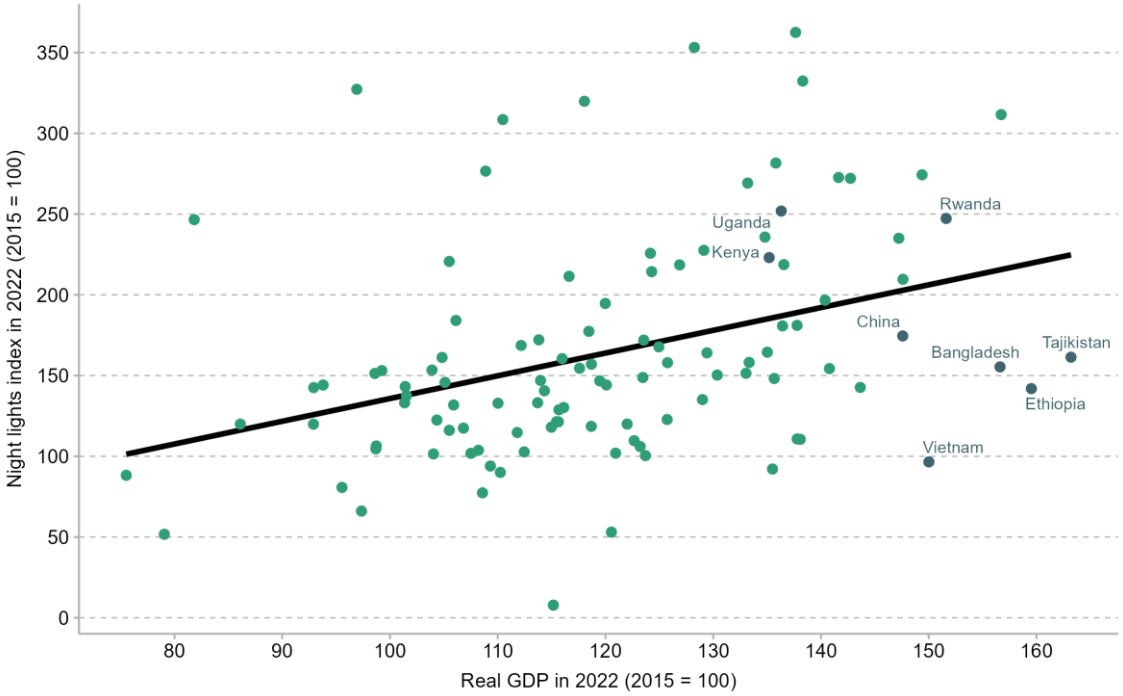
Figure 5.5 compares recorded GDP growth with growth in night lights between 2015 and 2022, for various countries (excluding the highest-income countries). The measure of night lights used is median annual night lights, summed within each country, from the VIIRS satellite sensor (VNL V2). These data have been extensively processed to remove cloudy, sunlit and moonlit pixels and to remove distortions arising from aurora, background radiation, biomass burning and gas flares.

Across countries, there is a clear positive association between recorded GDP growth and recorded growth in night lights, but even over this relatively long period, the association is far from perfect. This will be partly due to errors in measuring night lights, partly due to errors in measuring GDP growth, and partly due to GDP growth in some countries being less 'light-intensive' than in other

[64] Neither are gas flares, which are common in oil-producing countries, nor aurora, which occurs around the poles. More concerning in Ethiopia are fires (e.g. agricultural burning) and moonlight.

countries. For instance, the last could arise due to the sectoral composition of growth, as night lights are a notoriously poor proxy for growth in the agriculture sector (Gibson et al., 2021).

Figure 5.5. Relationship between night lights growth and recorded GDP per capita growth, 2015 to 2022



Note: R^2 = 0.14. Countries with a GDP per capita of greater than 25,000 PPP$ in 2022 are excluded. Guinea-Bissau is also excluded as it has extremely high nightlights growth. The black line is a linear best-fit line. The measure of night lights used is the VIIRS VNL V2, 'median masked' series.

Source: Night lights – Earth Observation Group, Payne Institute for Public Policy (Elvidge et al., 2021). GDP – Ministry of Planning and Economic Development for Ethiopia, World Bank (2023b) for all other countries.

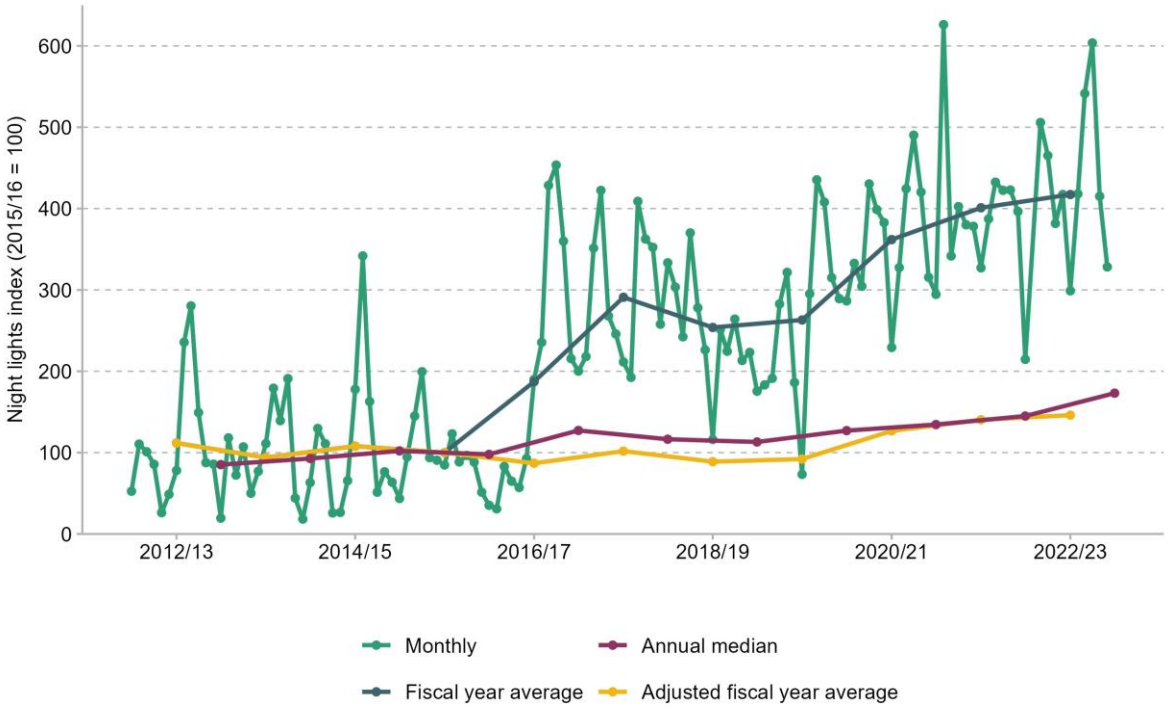
Notably, Ethiopia is in the lower right of this graph, due to its exceptionally high GDP growth combined with relatively modest growth in measured night lights. This puts Ethiopia well below the fitted black line, indicating unusually high growth given its night lights growth over this period. Other countries with very high GDP growth that is not matched by night lights growth include Bangladesh, Vietnam and Tajikistan.

Figure 5.6 provides a closer look at night lights data from Ethiopia since the 2012/13 fiscal year, as measured by the VIIRS sensor.[65] The green line labelled 'Monthly' shows monthly average night lights ('vcm' version). These data account for cloud cover, background radiation, sunlight and moonlight, but have not been processed to remove the effects of other light sources such as

[65] Earlier comparable data are unavailable, as the Suomi NPP satellite that hosts VIIRS was only launched in October 2011.

fires.[66] The dark grey line labelled 'Fiscal year average' averages these values across Ethiopian fiscal years.

Figure 5.6. Measured night lights in Ethiopia over time



Note: All series are indexed to the 2015/16 Ethiopian fiscal year. No comparable data are available for August 2022 due to a technical fault.

Source: Authors' calculations based on VIIRS data.

Taken at face value, these data show strong growth in night lights, but this growth is largely driven by a large jump between December 2016 and March 2017. As noted by Beyer, Hu and Yao (2022), a similar jump in measured night lights is recorded across the world, albeit with substantial cross-country variation. It coincides with a recalibration of the VIIRS sensor that occurred on 12 January 2017.

We have therefore attempted to correct the night lights data for the effects of this jump.[67] The result is the yellow line labelled 'Adjusted fiscal year average'. However, at least part of the jump

[66] Following Beyer, Hu and Yao (2022), we disregard pixels with negative night lights values, which can arise when areas are darker than the subtracted values for background light.

[67] The correction proceeds as follows. First, we estimate a regression model of the form $\log(NL_t) = \beta_0 + \beta_1 t + \beta_2 1(t > \text{January 2017}) + \epsilon_t$, where NL_t is measured monthly night lights, t is time (in days) and $1(.)$ is the indicator function (the data point for January 2017 is excluded from the regression). Then, adjusted monthly night lights are calculated as $NLadj_t = \exp\left(\log(NL_t) - \widehat{\beta_2}\right)$, where $\widehat{\beta_2} = 1.049588$ is the estimated coefficient on the indicator in the regression model, for all observations from February 2017 onwards.

in early 2017 may have been due to domestic Ethiopian factors. Notably, the Gilgel Gibe III Dam, which nearly doubled Ethiopia's electricity generation capacity, was inaugurated in December 2016. If electricity demand was constrained before, this could plausibly have led to a jump in light emitted (although note that VIIRS records night lights at around 1:30am local time, when electricity demand is typically low).

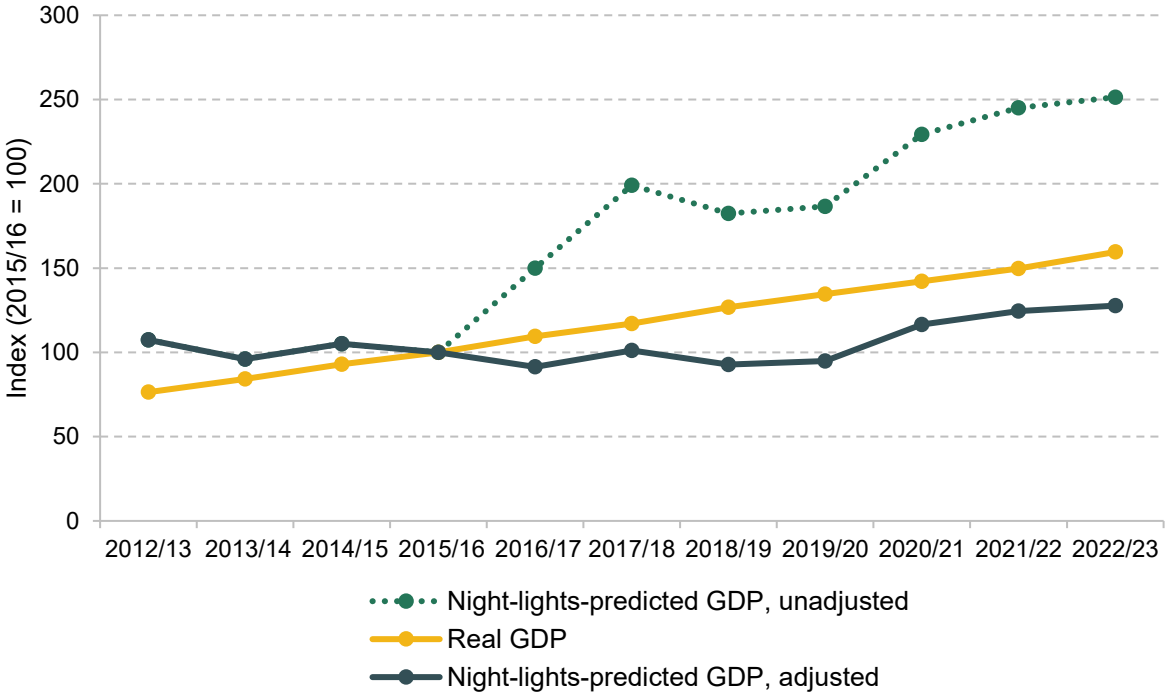
The purple line labelled 'Annual median' shows the same annual data as were used in Figure 5.5 which are by calendar year. As noted above, these data have been processed to account for additional light sources such as fires, and they appear to include a correction for the January 2017 sensor recalibration. The resulting series is broadly similar to the 'Adjusted fiscal year average' series, although the recalibration correction appears to be somewhat smaller than ours.

Figure 5.7 converts the adjusted and unadjusted fiscal year average night lights series into a prediction for GDP using the elasticity estimate for emerging markets and developing economies in Beyer, Hu and Yao (2022).[68] They find that a 1% change in underlying true GDP is associated with a 1.55% change in night lights. We use the monthly data, as this is the dataset they used to estimate the elasticity.[69]

[68] In particular, we calculate the index as $I_t = 100 \exp((\log(NL_t) - \log(NL_r))/1.55)$, where NL_r is night lights in the reference period. Note that this is a simplification – strictly speaking, the estimate for GDP growth is only unbiased in logs, not in levels.

[69] Note that Beyer, Hu and Yao (2022, page 35) specifically caution against using their elasticity estimate with annual VIIRS data given the effect of additional filtering and outlier removal on implied annual growth rates.

Figure 5.7. Night-lights-predicted GDP compared with recorded GDP



Source: Authors' calculations based on VIIRS data; Ministry of Planning and Development.

These estimates show that recorded GDP growth has been substantially faster than one would have expected based on the adjusted night lights series alone (the unadjusted series tells a very different story, but that is likely largely an artefact of sensor recalibration). Night-lights-predicted growth was strong between 2019/20 and 2020/21, but otherwise largely non-existent. This contrasts with high growth in recorded GDP.

The evidence from night lights is thus also consistent with overstated GDP growth in recent years. However, it is again important not to overinterpret these results. Night lights are known to be a noisy measure of economic activity, associated more with urban than rural growth, and can be skewed by factors such as the electrification of rural areas that are associated with but not necessarily representative of growth in economic activity.[70] Notably, night lights suggest practically zero growth even in the period between 2012/13 and 2015/16, when the recorded tax-to-GDP ratio was rising or broadly stable and earnings in the UEUS grew in line with recorded GDP.

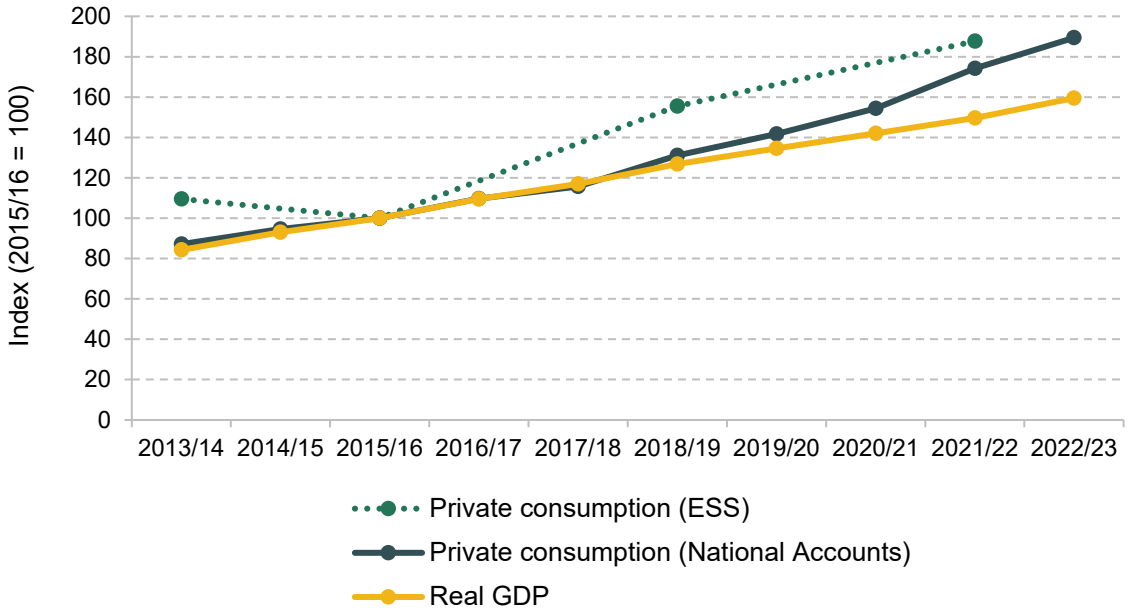
[70] Unlike much of the literature, including Henderson, Storeygard and Weil (2012), Hu and Yao (2022) and Beyer, Hu and Yao (2022), we do not calculate an optimal composite measure of night lights and recorded GDP. The main reason for this is that these composite measures are in practice heavily influenced by recorded GDP in other countries, which we discussed in the first part of this section.

A third alternative measure of economic growth is aggregate consumption from the Ethiopia Socioeconomic Survey. Aggregate consumption from the ESS is estimated total consumption of 25 food items, 11 basic household goods and 12 other types of expenditure, based on a sample of urban and rural households. This measure of aggregate consumption captures around half of aggregate household final consumption as reported in the national accounts and around a third of reported GDP. Consumption items that are omitted from the ESS measure of aggregate consumption but counted in the national accounts include consumer durables such as mobile phones, cars and motorcycles, as well as housing costs (actual and imputed).

As shown in Figure 5.8, private consumption in the ESS has evolved roughly in line with the national accounts measure of private consumption.[71] In fact, between 2015/16 and 2021/22, estimated aggregate private consumption from the ESS has grown slightly faster than private consumption in the national accounts. However, this was plausibly driven by an unusually low ESS consumption estimate in 2015/16 (potentially due to statistical noise); over the period between 2013/14 and 2021/22, ESS consumption grew by less than private consumption in the national accounts.

[71] Since 2017/18, private consumption in the national accounts has grown substantially faster than overall GDP, as the reported consumption share of GDP has risen.

Figure 5.8. Comparing aggregate consumption from the Ethiopia Socioeconomic Survey with GDP



Note: Private consumption from the ESS and from the national accounts have both been deflated using the overall GDP deflator for comparability. Aggregate consumption from the ESS is estimated total consumption of 25 food items, 11 basic household goods and 12 other types of expenditure, based on a sample of urban and rural households. Data for the four ESS waves used (waves 2 to 5) were primarily collected in February 2014, February 2016, June 2019 and (likely) April 2021. As the June 2019 wave falls roughly in between two fiscal years, we deflate it using the simple average between the deflators for the two adjacent fiscal years. The remaining waves are deflated using the deflators for the fiscal years in which they fall.

Source: Ethiopia Socioeconomic Survey; Ministry of Planning and Development; authors' calculations.

However, these findings again need to be interpreted with caution. Most importantly, there is no guarantee that the share of true total consumption covered by the ESS measure of aggregate consumption would have stayed constant over time. As the ESS measure likely covers a higher share of actual consumption for poor rural households, one might have expected this share to decrease over time as Ethiopia has become richer and more urban. This would suggest that underlying growth of total private consumption might have been even faster than ESS consumption growth. However, recent increases in the relative prices of agricultural products may well have had the opposite effect, leading to higher ESS consumption growth than underlying growth in total consumption.

Many other factors could have meant that ESS consumption growth may not have been an accurate reflection of underlying growth in total consumption. Between the 2015/16 and 2018/19 waves of the ESS, when most of the growth in ESS consumption over our sample period was recorded, the ESS underwent major changes, including the selection of an entirely new sample of households. Other minor changes in survey methodology occurred across waves. As a result of conflict, not all areas were sampled in all waves.

Together with the limited consumption coverage of the ESS and unavoidable statistical noise, these caveats mean that ESS consumption growth can only be an indicative guide to underlying growth in total consumption and GDP. Nevertheless, it is notable that measured consumption growth in the ESS is entirely consistent with the very fast consumption growth recorded in the national accounts. The ESS estimates thus lend plausibility to the GDP growth numbers recorded in the national accounts.

Discussion: have GDP measurement issues contributed to the falling tax-to-GDP ratio?

Between 2015/16 and 2022/23, officially reported real GDP increased by 60%. This is in line with the growth in aggregate consumption in the Ethiopia Socioeconomic Survey, but far more than the growth in real GDP as predicted by our two other proxy measures: real employment earnings from the Urban Employment Unemployment Survey, which *decreased* by 3%, and growth predicted by night lights, which was only 28% over this period. If real GDP had increased as predicted by night lights, the tax-to-GDP ratio would have been 9.4% in 2022/23. If it had increased in line with urban employment earnings, it would have been 12.3%.

Ethiopia's reported growth performance has been exceptional, but exceptional growth spurts happen. Urban employment earnings may have genuinely deviated from actual economic growth, especially as around half of urban employees represented in the survey are government employees. Night lights are known to be a noisy measure of economic activity, are more representative of urban rather than rural growth, and can be skewed by factors such as the electrification of rural areas that are associated with but not necessarily representative of growth in economic activity.

We have therefore taken official GDP data as given in the rest of this report.

6. Conclusion and recommendations

6.1 Conclusions

Table 6.1. Summary of key findings

Issue	Factor	Estimate, percentage points of GDP (subject to assumptions and uncertainty)
Ethiopia's tax-to-GDP ratio is 5.5 percentage points lower than the SSA median	Structural factors: Ethiopia's economic composition, demographics and other structural factors that are associated with a lower tax-to-GDP ratio	2.2
	Policy factors: uncollected excise and VAT on fuel, no excises on financial transactions and airtime	2.1
	Compliance-related factors	1.2
Ethiopia's tax-to-GDP ratio has fallen by 4.6 percentage points since 2015/16	Structural factors: changes in the structure of the economy that have made it harder to raise tax revenues, including falling public investment and falling imports	2.2
	Policy factors (new VAT exemptions)	< 0.1
	Compliance-related factors	1.8
	Tax instruments not considered	0.6
Other relevant issues	The 'narrow' estimate of the Tigray conflict on tax-to-GDP is 0.25 percentage points (included within the estimates above)	
	GDP growth may have been overstated, but there is not strong enough evidence to conclude that it was	

Table 6.1 summarises how this report quantifies the relative importance of structural, policy and compliance-related factors for Ethiopia's low and falling tax-to-GDP ratio. These figures are reliant on a number of subjective judgements and assumptions and are far from exact.

Structural factors are a major determinant of Ethiopia's low and falling tax-to-GDP ratio. Ethiopia's growth model of the mid 2010s, which combined high levels of public sector

investment with high levels of imports, facilitated a high tax-to-GDP ratio that peaked at 12.4% in 2014/15. As that growth model stalled, Ethiopia's tax-to-GDP ratio fell.

6.2 Recommendations

Where can Ethiopia go from here? Reverting to the growth model of the mid-2010s may seem like a tempting option. But regardless of the merits of this growth model, and whether reverting to it would even be possible, high public investment is not a sustainable way to increase the tax-to-GDP ratio. For any public sector investment, the Ministry of Revenue may recoup some proportion in additional tax revenue. This is better than nothing, but not enough to make the investment pay for itself through increased tax revenues in the short term.

The second – and more sustainable – route would be to diversify tax collection. Ethiopia continues to be heavily reliant on taxes on imports and taxes collected from the public sector, which are relatively straightforward to collect compared with other sources. We estimate that these two sources accounted for an average of 60% of federal tax revenue between 2019/20 and 2021/22.[72] Tax collection from state-owned enterprises is much higher than from the private sector relative to their contribution to the economy: state-owned enterprises accounted for an average of 10% of non-agricultural GDP between 2019/20 and 2021/22,[73] but averaged 29% of domestic federal VAT and corporate income tax in those years. The high reliance on taxes on imports and taxes collected from the public sector means that Ethiopia's tax-to-GDP ratio is vulnerable to changes in imports and public sector activity.

Without further increasing taxes on imports (which are already high by regional standards), or by further increasing tax paid by state-owned enterprises, the only way to increase the tax-to-GDP ratio will be to increase tax collections from the private sector. This will be challenging. With a few notable exceptions discussed in this report, Ethiopia's policy choices are similar to those of other SSA countries (though it is not necessarily the case that policy choices in other countries are optimal). Compliance is weak and appears to be going backwards (even after accounting for changes in compliance arising from structural changes).

[72] This is equal to the sum of all taxes on trade (customs duty, surtax, excise, import VAT), VAT withholding revenue, federal employment income tax revenue (all federal employment income tax is paid by the public sector) and 29% of federal domestic VAT revenue and corporate income tax revenue, divided by total federal tax revenue. 29% is the average share of VAT and CIT between 2019/20 and 2021/22 accounted for by state-owned enterprises. We do not capture domestic excise, turnover tax, or other direct taxes paid by the public sector.

[73] We use VAT data to calculate gross value added by state-owned enterprises. In particular, we use total sales minus total purchases of non-capital goods. This assumes that VAT records for state-owned enterprises are accurate. The Ethiopian Petroleum Supply Enterprise appears to have missing data for total purchases. We assume that its value added is equivalent to 5% of its sales, which is in line with data on its fuel transportation margins. Other large state-owned enterprises appear to have complete VAT records.

The National Medium-Term Revenue Strategy (NMTRS) (Ministry of Finance, 2024) seeks to address these challenges and sets out a range of reforms to tax policy and administration with the ambitious goal of increasing Ethiopia's tax-to-GDP. Below we add recommendations for specific policy proposals not included in the NMTRS, in addition to recommendations on the *process* by which tax policy and administration are conducted.

In terms of policy proposals, we recommend that the Government of Ethiopia considers conducting a thorough evaluation of the following policy proposals:

- **Designating large private sector companies as VAT withholding agents.** Currently, only the public sector (government and state-owned enterprises) is a VAT withholding agent in Ethiopia. This report has found that VAT withholding has been important in ensuring compliance, and one of the reasons that the tax-to-GDP ratio fell is because spending by the public sector has decreased. Other countries also designate large private sector companies as VAT withholding agents, as it is generally believed that large private sector companies are more compliant than their suppliers. However, careful analysis must be undertaken to determine which companies should be designated as VAT withholding agents in Ethiopia, what the appropriate VAT withholding rate is, and whether the tax administration has the capacity to monitor VAT withholding.
- **Increasing the VAT rate.** The VAT rate in Ethiopia is slightly lower than those in other African countries. Increasing the VAT rate to the sub-Saharan African median of 17.5% may increase revenue, but at the cost of increasing the tax wedge between compliant and non-compliant firms.

In terms of the tax policymaking and administration *process*, we recommend that the Government of Ethiopia considers:

- **Closely monitoring that tax policy is being correctly implemented.** We have encountered several instances where policy as applied is substantially different from policy as stated in law. VAT and excise on fuel was not collected in line with official policy until recently. The VAT withholding rate was changed from 100% to 50% in 2019, but many firms continue to be withheld at 100%. Other development partners have also stressed the importance of reviewing policy implementation (Grote et al., 2020).
- **Regularly monitoring the tax-to-GDP ratio going forward.** By now, the tax-to-GDP ratio has been falling for almost 10 years. Had the tax-to-GDP ratio been monitored on a more regular basis, some issues may have been diagnosed and dealt with earlier. Revenue monitoring in Ethiopia has historically focused on nominal trends (Yeshineh, Gebrewolde and Alamerie, 2023), which can be misleading especially in times of high inflation. Some of the analysis in this report, including the VAT gap analysis, CIT performance analysis, monitoring of imports, and the use of the Urban Employment Unemployment Survey to monitor formal

sector earnings, could be updated on a regular basis. Regular reporting of tax expenditures, including of domestic tax expenditures, would also be helpful.

- **Ensuring that the measure of the tax-to-GDP ratio is consistent across government.** This report uses the measure of the tax-to-GDP ratio used by the Tax Policy Directorate of the MoF, based on data from the MoR. We understand that the Fiscal Policy Directorate is using a different measure of the tax-to-GDP ratio, which treats tax paid by state-owned enterprises and the allocation of revenue between federal and regional governments differently.
- **Conducting randomised audits of taxpayers to monitor compliance.** Non-compliance in this report can only be assessed using a 'top-down' methodology, comparing expected tax revenues from national accounts and surveys with actual tax revenues. This provides an indication of where the sources of non-compliance may lie but is highly dependent on assumptions and data quality. 'Bottom-up' measures of non-compliance from well-designed randomised audits can complement 'top-down' measures by giving the MoF and MoR a better understanding of how and where non-compliance is occurring.
- Maintaining the quality of administrative tax data for VAT, CIT and customs duty, and improving data sharing processes between the Ministry of Finance and the Ministry of Revenue. The quality of administrative (federal) VAT, CIT and customs duty data has substantially improved over the last five years, making it easier to base policy on sound evidence and to understand recent revenue trends. However, the lack of established data sharing processes between the MoF and the MoR makes it difficult for the MoF to access administrative data in a timely manner. For the purposes of this report, we were unable to obtain VAT or CIT data for fiscal year 2022/23. Administrative data on regional taxes are still of variable quality and should be improved.

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Appendix A. Revenue tables

Table A.1. Tax as a % of GDP for direct taxes

Fiscal year	Corporate income tax	Employment income tax	Of which federal	Of which regional	Other direct taxes	Of which federal	Of which regional
2014/15	1.76	1.53	0.37	1.16	1.22	0.32	0.90
2015/16	1.77	1.61	0.38	1.22	1.16	0.31	0.85
2016/17	1.73	1.45	0.35	1.10	1.26	0.33	0.93
2017/18	1.41	1.58	0.45	1.13	1.44	0.54	0.90
2018/19	1.64	1.53	0.40	1.13	1.13	0.30	0.83
2019/20	1.41	1.48	0.40	1.08	1.03	0.30	0.73
2020/21	1.52	1.52	0.41	1.11	0.96	0.25	0.71
2021/22	1.23	1.35	0.36	0.98	0.88	0.23	0.65
2022/23	1.03	1.24	0.34	0.90	1.00	0.21	0.79

Table A.2. Tax as a % of GDP for indirect taxes and trade taxes

Fiscal year	**VAT, excluding refunds**	Of which domestic, federal	Of which VAT withholding	Of which regional VAT	Of which import VAT	VAT refunds	VAT, net of refunds	**Excise**	Of which domestic	Of which imports	Other indirect taxes	**Customs duty, surtax and social welfare levy**
2014/15	4.84	1.47	1.23	0.68	1.47	0.34	4.51	0.76	0.01	0.42	0.23	2.07
2015/16	4.43	1.23	1.06	0.73	1.42	0.28	4.15	0.77	0.02	0.44	0.22	2.14
2016/17	4.16	1.26	0.92	0.68	1.30	0.43	3.72	0.75	0.02	0.38	0.20	1.93
2017/18	3.66	1.25	0.67	0.58	1.16	0.46	3.19	0.65	0.03	0.30	0.21	1.74
2018/19	3.31	1.25	0.47	0.55	1.03	0.28	3.03	0.66	0.03	0.28	0.24	1.46
2019/20	2.81	0.99	0.32	0.43	1.07	0.24	2.57	0.70	0.03	0.31	0.20	1.59
2020/21	2.63	0.93	0.26	0.54	0.90	0.21	2.42	0.77	0.11	0.22	0.22	1.33
2021/22	2.33	0.78	0.20	0.51	0.83	0.18	2.14	0.67	0.12	0.21	0.16	1.10
2022/23	2.41	0.78	0.33	0.56	0.74	0.19	2.23	0.60	0.11	0.17	0.17	1.02

Table A.3. Aggregates

Ethiopia's tax-to-GDP ratio: benchmark estimation and performance analysis

Fiscal year	Tax revenue, billions ETB	GDP, billions ETB	Tax-to-GDP, gross of VAT refunds, %	Tax-to-GDP, net of VAT refunds, %	Social security contributions, % of GDP
2014/15	165	1,332	12.42	12.09	0.73
2015/16	185	1,568	12.09	11.81	0.83
2016/17	202	1,833	11.47	11.04	0.81
2017/18	225	2,200	10.69	10.23	0.97
2018/19	261	2,696	9.96	9.68	0.81
2019/20	303	3,375	9.23	8.99	0.91
2020/21	380	4,341	8.95	8.74	0.82
2021/22	464	6,157	7.72	7.53	0.69
2022/23	636	8,722	7.47	7.29	0.82

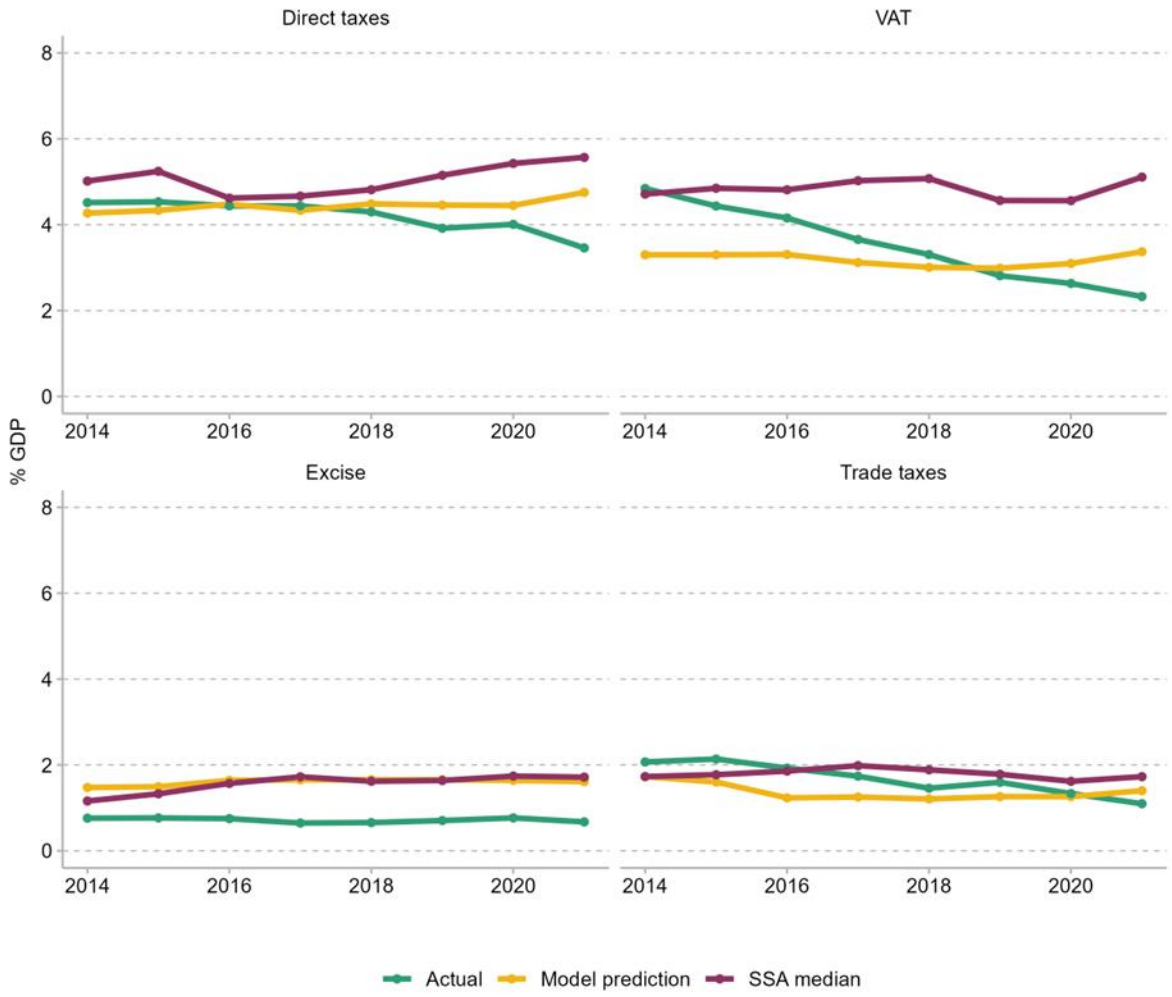
Note and Source for Tables A.1–A.3

Note: 'Other direct taxes' refers to taxes on rental incomes, dividends, capital gains, royalties, withholding taxes on imports, interest income taxes, agricultural income tax, urban/rural land value tax and personal business income tax. 'Employment income tax' refers to both federal and regional employment income tax. 'Other indirect taxes' refers to turnover tax and stamp duty.

Source: Ministry of Revenue official revenue reports.

Appendix B. Supplementary figures and table

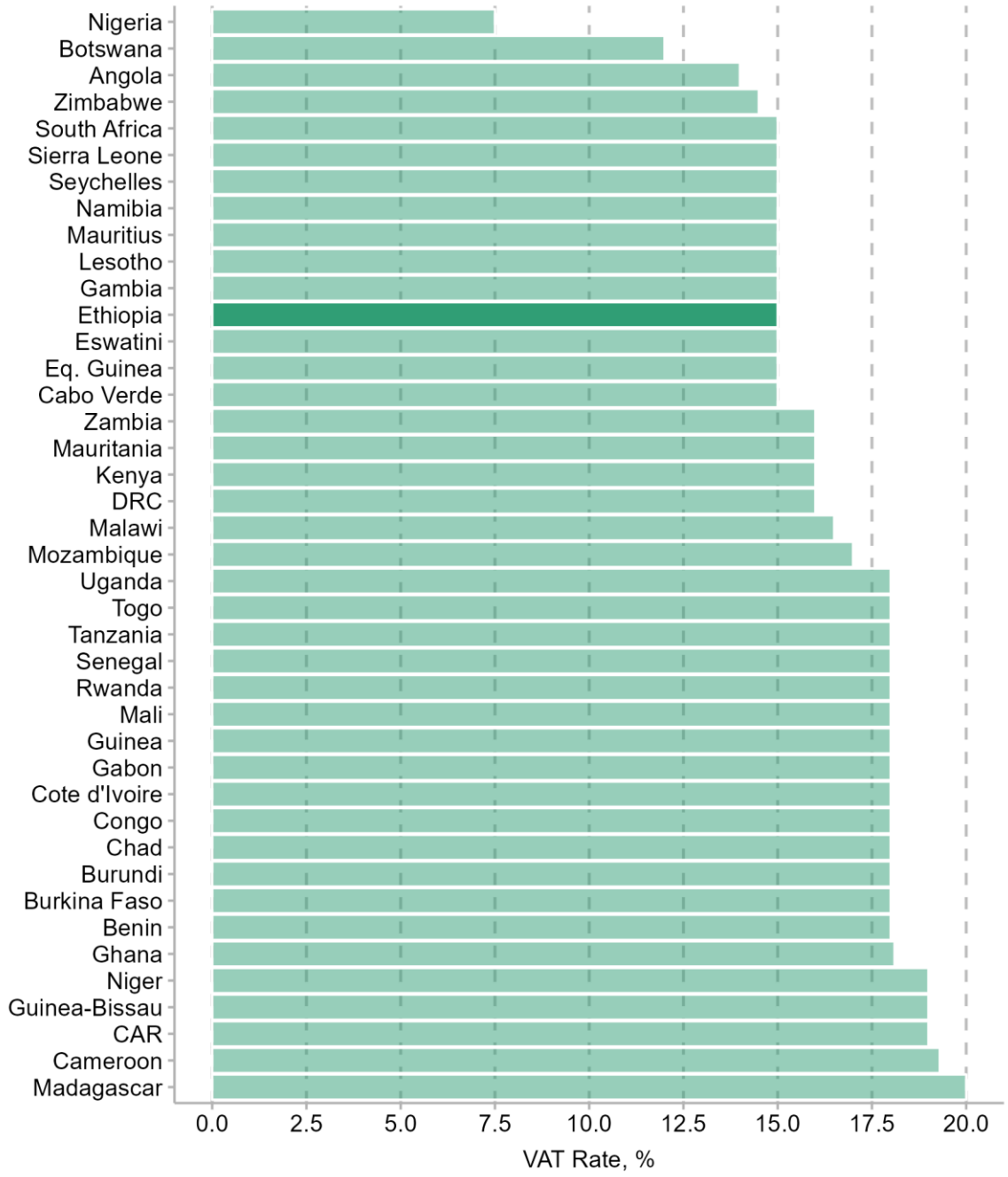
Figure B.1. Predicted direct tax, VAT, excise and trade taxes as a % of GDP for Ethiopia



Note: Predictions are only available from 2014 due to inconsistencies with how tax revenue by head is reported in Ethiopia between 2013/14 and 2014/15. For consistency with the UNU-WIDER Government Revenue Dataset, VAT and excise include VAT and excise on imports respectively, whereas trade taxes exclude VAT / excise on imports but include surtax. 'SSA median' refers to the median for all other SSA countries where data are available except Ethiopia. See Appendix C for details on the methodology.

Source: Actual – Ethiopian Ministry of Finance. SSA median – UNU-WIDER (2023). See text for details of predictors used in the model.

Figure B.2. VAT rate in sub-Saharan Africa



Source: IMF historical VAT rate database (https://www.imf.org/external/np/fad/tpaf/pages/vat.htm), cross-referenced with countries that have a VAT (https://www.vatcalc.com/global/how-many-countries-have-vat-or-gst-174/).

Table B.1. VAT exemptions in East Africa

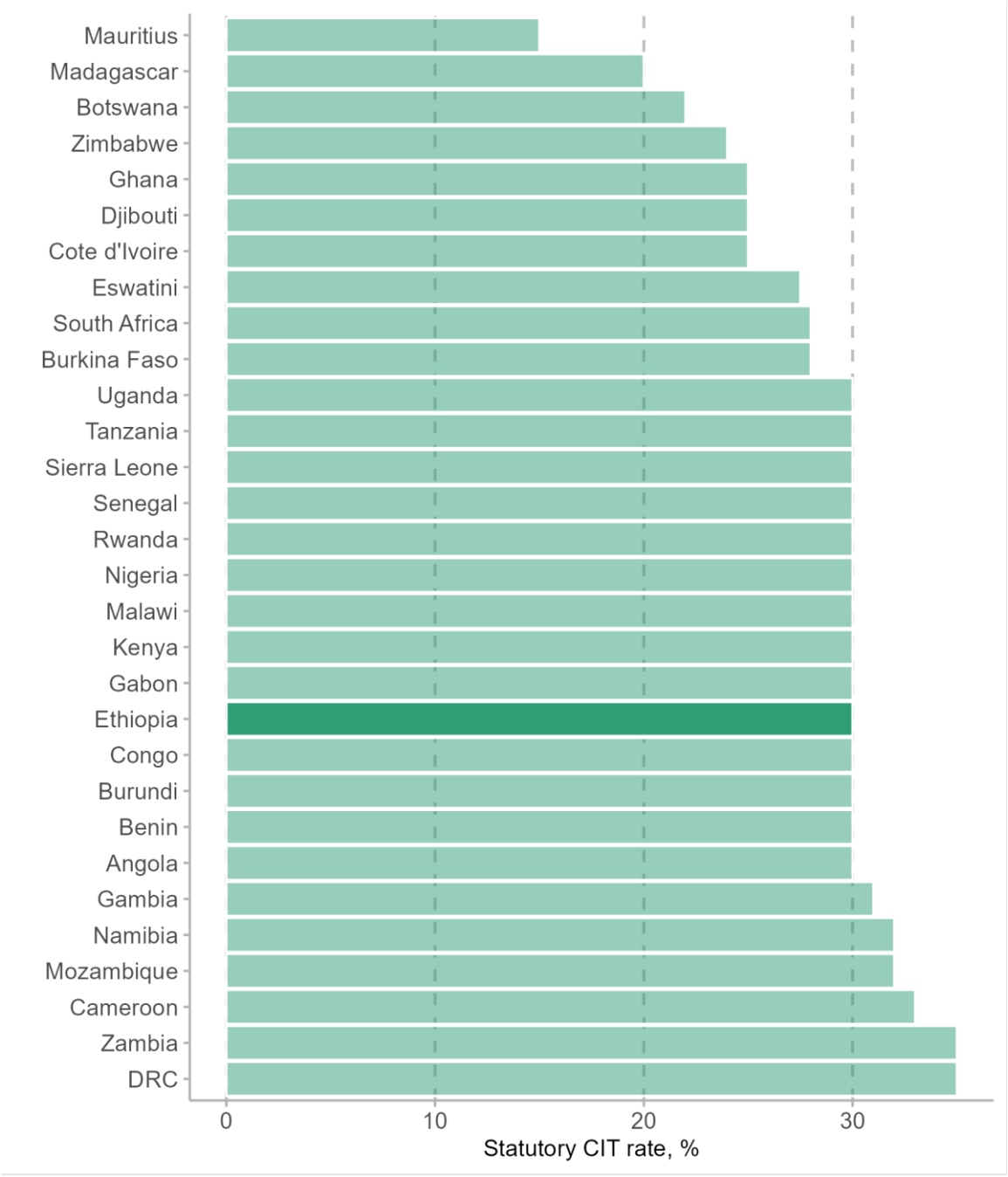
	Ethiopia (current)	Ethiopia (proposed new law)	Kenya	Rwanda	Uganda
Agriculture and food	Certain agricultural inputs, and supply of grains, flour, soya beans, oil seeds, injera, milk, bread, vegetable oils, sugar, pasta, baby formula, eggs, but not vegetables or meat.	Certain agricultural inputs. The new Act does not specify a list of exempt agricultural products.	Certain agricultural inputs, all unprocessed agricultural goods, processed milk products, bread, maize flour, green tea.	Certain agricultural inputs, all unprocessed agricultural goods, processed milk products.	Agricultural inputs, unprocessed agricultural goods (except wheat), processed milk products.
Transportation	Public transport.	Public transport.	Public transport, aircraft spare parts, locally produced tourist vehicles.	Public transport.	Public transport, aircraft spare parts.
Energy/water	All electricity, kerosene and water. VAT is officially charged on fuel but the de-facto rate is low.	Water, and electricity below a certain monthly consumption limit.	Oil mining/ exploration. Fuel was until recently taxed at a reduced VAT rate of 8%. Water. Solar equipment and inputs to solar equipment manufacturing.	Water, some energy supply equipment, kerosene.	Solar panels, inputs into clean energy projects, kerosene.
Investment zones	Not specified by the original Act, but various directives provide VAT exemptions to certain investors.	Certain goods/ services purchased by international investors, based on regulation of investment incentives.	Inputs for the construction of Special Economic Zones.	All goods/services imported by companies in Special Economic Zones.	Construction of industrial parks.

Other	Books, imported cement, supply of cotton to textile factories, supply of leather to shoe factories.		Paper products, stoves, compasses, local film production, inputs to tourist facilities, tractors, transport of cargo outside Kenya.	Books, newspapers, mobile phones, SIM cards, ICT equipment.	Film production, locally made textiles, inputs to textile production, locally produced software, accommodation outside Kampala, construction of large factories, construction of hotels, deep-cycle batteries, women's sanitary products.

Note: This table does not include financial services, property transactions, medical products and services, education, government or NGO services, exports or religious organisations, as these are exempt in most countries (https://www.imf.org/external/np/fad/tpaf/pages/vat.htm) or are considered difficult to tax under the VAT (Adam et al., 2011; Hutton, 2017). Note that the list for Ethiopia may not cover ad-hoc exemptions for certain projects/investors.

Source: Ethiopia (current) – Harris and Seid (2021) and information obtained from the Legal Department of the Ministry of Finance. Ethiopia (proposed new law) – Ministry of Finance (2023). Kenya – Republic of Kenya (2013). Rwanda – Republic of Rwanda (2015). Uganda – Ernst and Young (2024).

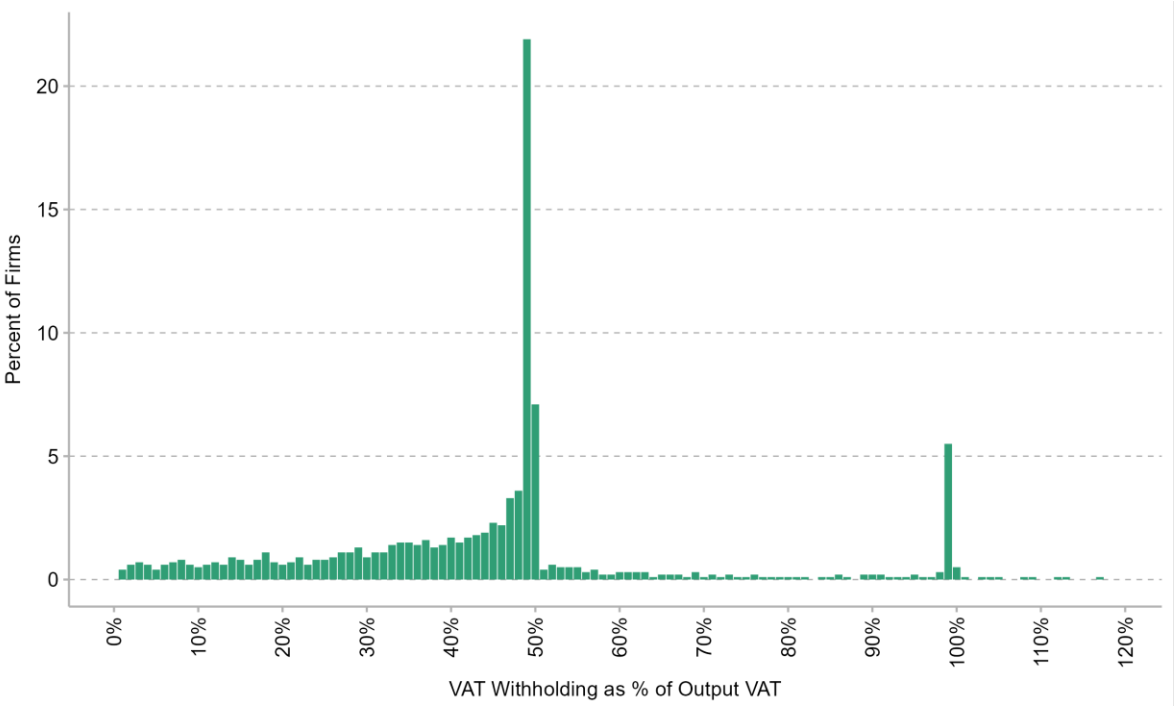
Figure B.3. Statutory rates of corporate income tax in sub-Saharan Africa



Note: For 2020, for countries where data are available.

Source: KPMG, https://kpmg.com/sg/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html.

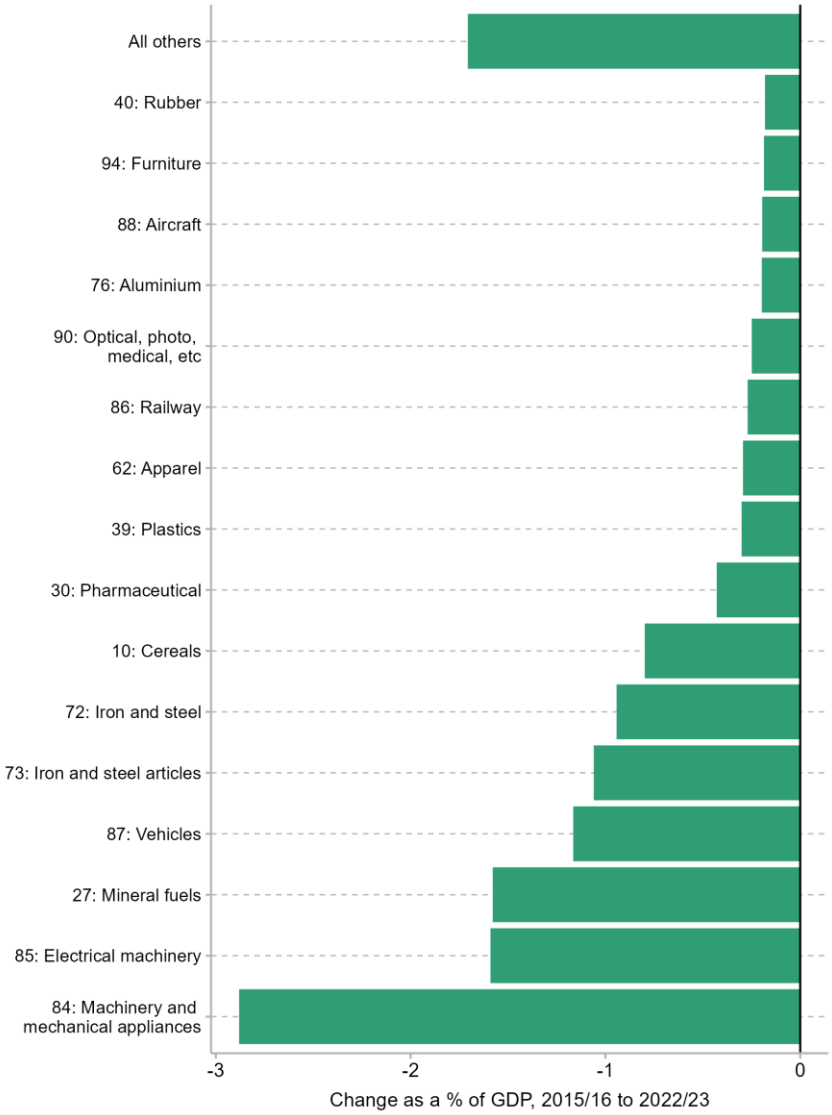
Figure B.4. VAT withholding credits as a % of output VAT



Note: The numbers are based on the VAT declarations of firms that are subject to VAT withholding. The sample is all firms between June 2021 and March 2023 that claim VAT withholding credits in a given month of more than 1 million ETB. There are two clear spikes, at just under 50% and just under 100%. Values less than 50% are feasible if only part of a firm's sales are subject to VAT withholding. The firms that claim VAT withholding credits equal to 100% of output VAT are generally larger. Between June 2021 and March 2023, 30% of VAT withholding credits were declared by firms whose share of VAT withheld was between 75% and 125% of their monthly output VAT. VAT withholding may be more than 100% of output VAT due to errors, or due to differences in the timing of output VAT and withholding credit reporting.

Source: Authors' calculations using VAT declaration data from the Ministry of Revenue.

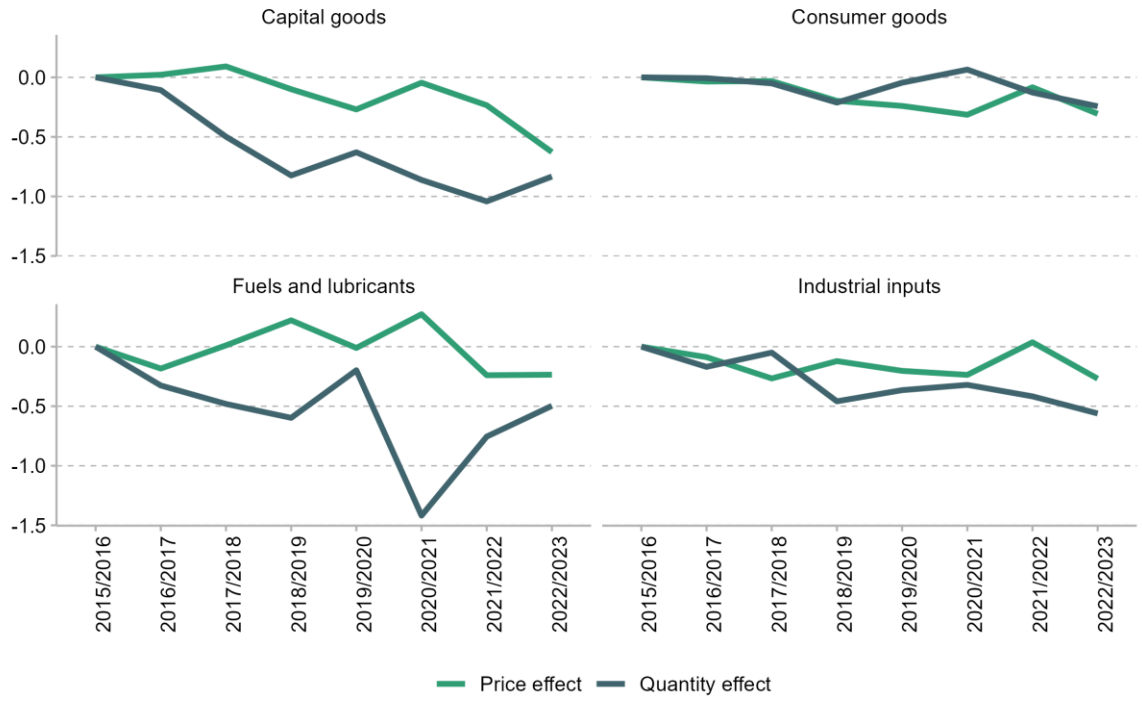
Figure B.5. Change in import categories as a % of GDP, 2015/16 to 2022/23



Note: The underlying data are based on merging data from the UN's Comtrade database for the periods covering 2015/16 to 2017/18 with Ethiopian customs microdata from the ECMS for the period covering 2018/19 to 2022/23. This is done because Ethiopian customs microdata for earlier periods are unreliable (see Figure E.1 in Appendix E). Comtrade data for Ethiopia contain the value and volume of imports at the HS6/month level, in USD. They are first converted to ETB using the average annual official exchange rate, and then collapsed to the Ethiopian fiscal year. Customs microdata from ECMS are available at the shipment/month level and are collapsed to the HS6/fiscal-year level. 'All others' includes all HS2 chapters with an individual fall of less than 0.15% of GDP.

Source Comtrade – United Nations (2024). ECMS customs microdata – Ethiopian Customs Commission. GDP data – Ministry of Planning and Economic Development.

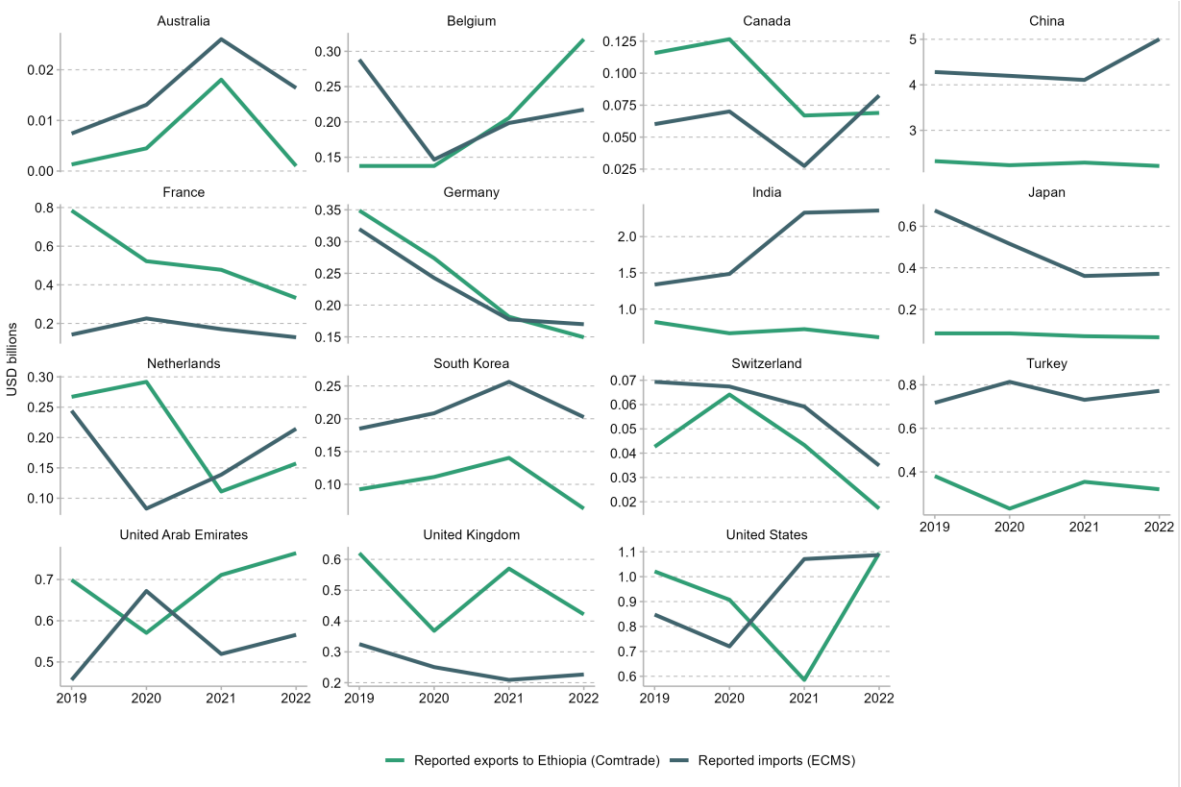
Figure B.6. Import price / quantity decomposition for import categories



Note: The note under Figure 4.13 details how goods are separated into capital goods, consumer goods, fuels and lubricants, and industrial inputs. The category 'Other' is not shown. The note under Figure 4.14 defines the price and quantity effects.

Source: Comtrade – United Nations (2024). ECMS customs microdata – Ethiopian Customs Commission. GDP data – Ministry of Planning and Economic Development.

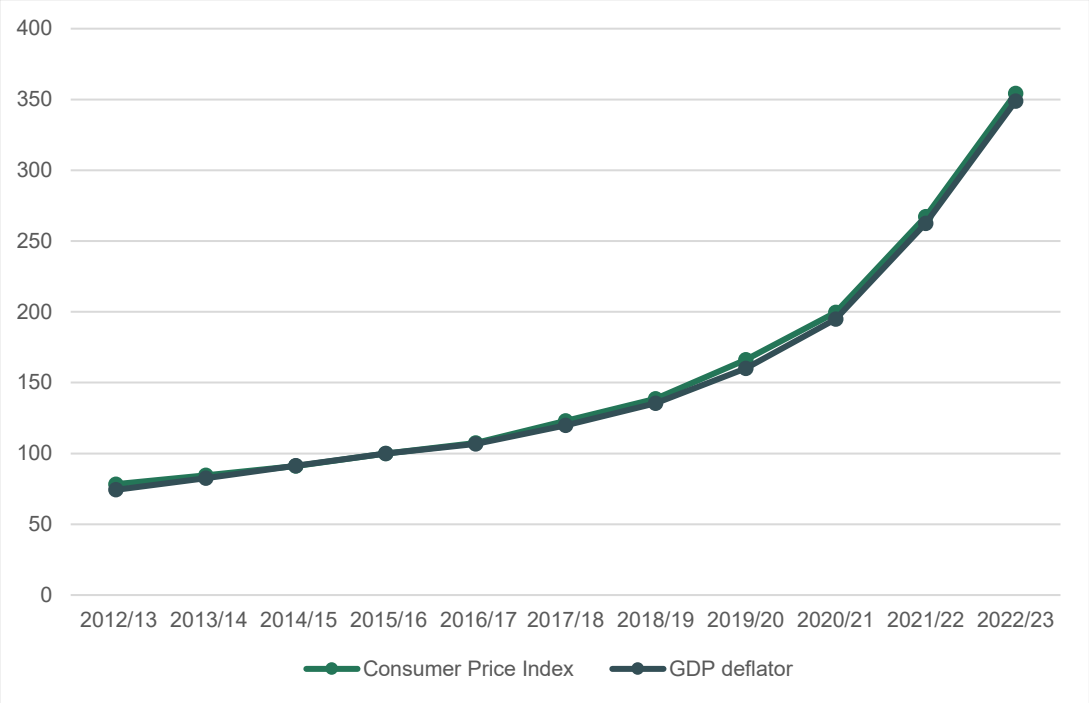
Figure B.7. Import gap by country



Note: The scale on the y axis varies by graph. Years refer to calendar years.

Source: Reported imports – Ministry of Revenue. Reported exports to Ethiopia – Comtrade (United Nations, 2024).

Figure B.8. Comparing the GDP deflator and the Consumer Price Index



Note: Both series are rebased to 100 in 2015/16.

Source: Ministry of Planning and Development; Central Statistical Agency; National Bank of Ethiopia.

Appendix C. Additional notes on the tax-to-GDP ratio prediction model

The cleaning and prediction approach is as follows:

- The unit of analysis is the country/year pair.
- The data range is 2005–21.
- Only country/year observations with non-missing tax-to-GDP ratios (excluding social security contributions) and tax-to-GDP ratios of less than 25% are included in the analysis. The rationale for dropping observations with high tax-to-GDP ratios is that at a point, a country's tax-to-GDP ratio is likely to be influenced more by political choices than by constraints on compliance, the structure of the economy or tax administration, so the relationship between predictor variables and the tax-to-GDP ratio for high-tax countries is unlikely to be informative for low-tax countries. The specific 25% cut-off is arbitrary.
- Missing values for predictor variables are dealt with in the following way:
    - If a country/year observation has more than nine predictor variables with missing values, it is dropped. These tend to be very small countries.
    - If there are nine or fewer predictor variables, missing predictor variables are imputed using a random forest (specifically the missRanger package developed by Mayer (2024)).
- 75% of the data is randomly allocated to the train sample and 25% to the test sample. The test sample always includes Ethiopia. The unit of randomisation for the split is the country, not the country/year.
- The random forest algorithm (n_trees = 1000, min_n = 2) is set up to predict median tax-to-GDP for a given set of predictor variables, to allow for comparisons against the sub-Saharan African median. This is done using the quantreg (Koenker, 2024) package.

The sources for the data are as follows:

- UNU-WIDER (2023) for tax revenue data.
- Alvaredo et al. (2022) for the share of income accrued by the top 10% of adults.
- Ritchie, Rosado and Roser (2022) for oil production, electricity use, and CO_2 emissions per capita.
- World Bank (2023b) for all other variables.

Appendix D. VAT gap analysis additional results and methodology

The VAT gap analysis in this report is based on a model that was created for Ethiopia by an IMF team in 2019 (hereafter Hutton et al. (2019)), which is itself an implementation of the IMF's RA-GAP methodology (described in Hutton (2017) and an online course created by the IMF (hereafter IMF (undated)).[74] This appendix does not discuss the general RA-GAP methodology, which is covered extensively by Hutton (2017) and IMF (undated), but instead discusses the main changes made to the Hutton et al. (2019) model. The discussion of the methodology is divided into the derivation of the potential VAT base from national accounts and the supply and use tables; the calculation of actual VAT revenue; and assumptions made on the policy and model structure.

Before turning to the methodology, Figure D.1 presents results on the VAT gap for all sectors (note that the y-axis limits vary by sector).

Potential VAT base

We derive the potential VAT base by recovering a supply and use table (SUT) from the 2015/16 Social Accounting Matrix (SAM). This can be downloaded by following the instructions on page 28 of Mengistu et al. (2019). The SUT is processed into the potential VAT base in line with IMF (undated) guidance. Hutton et al. (2019) use the 2010/11 SUT. A key difference between the 2015/16 SAM and the 2010/11 SUT is that the former allows for a distinction between household and non-household production of agricultural commodities.

It also appears that the size of the potential VAT base under the comprehensive system (a set-up of the model without exemptions or reduced ratings, and with full compliance) in this study is very different from that in the Hutton et al. (2019) study. For example, we estimate the potential VAT base from the agricultural sector to be 25.8% of GDP in 2017/18, whereas Hutton et al. estimate it to be 10.5% of GDP. Agriculture actually made up 33.2% of GDP in 2017/18 (see Table D.1). A sector's potential VAT base under the comprehensive system is not exactly the same as a sector's contribution to GDP,[75] but it would be expected to be close. Hutton et al. also estimate the potential VAT base in the transport and communications sector to be 16.3% of GDP, despite it only making up 4.0% of GDP. We estimate the potential VAT base from this sector to be 1.3%

[74] Available at https://www.edx.org/learn/economics/the-international-monetary-fund-ra-gap-vat-gap-estimation-model.

[75] Potential VAT under the comprehensive system for a given sector is calculated as Market Output + Imports – Exports – Intermediate Consumption – Gross Fixed Capital Formation, whereas a sector's gross value added is Market Output – Intermediate Consumption.

of GDP in 2017/18, which is smaller than the sector’s contribution to GDP because it is assumed to be investment-intensive.

Figure D.1. VAT gap results for all sectors

Note: See text for methodology.

Source: Authors' calculations based on IMF VAT gap methodology (Hutton et al., 2019), tax administrative data from the Ministry of Revenue, national accounts from the Ministry of Planning and Economic Development, and the 2015/16 SAM from Mengistu et al. (2019).

The large discrepancies between Hutton et al.'s potential VAT base and GDP statistics may reflect issues with extrapolation or other errors.

Table D.1. Comparison of potential VAT base under the comprehensive system between this study and Hutton et al. (2019), and sector-level gross value added, 2017/18

Sector	Gross value added, % of GDP [national accounts]	Potential VAT base (comprehensive), % of GDP [Hutton et al., 2019]	Potential VAT base (comprehensive), % of GDP [this study]
Agriculture, hunting & forestry	33.2	10.5	25.8
Mining & quarrying	3.2	0.0	0.1
Manufacturing	6.2	10.6	4.2
Electricity & water	0.8	3.6	0.7
Construction	22.0	22.2	18.3
Wholesale & retail trade	13.2	9.4	12.5
Hotels & restaurants	2.6	1.1	0.7
Transport & communications	4.0	16.3	1.3
Financial intermediation	3.4	1.7	2.2
Real estate, renting & business activities	3.9	-0.1	1.6
Public administration & defence	4.6	0.4	3.7
Education	3.7	3.2	2.6
Health & social work	1.2	1.0	1.2

Note: Potential VAT base under the comprehensive system is calculated as Market Output + Imports – Exports – Intermediate Consumption – Gross Fixed Capital Formation for a given sector.

Source: Gross value added – Ministry of Planning and Economic Development. This study – authors' calculations based on 2015/16 Social Accounting Matrix (Mengistu et al., 2019) and national accounts from the Ministry of Planning and Economic Development. Potential VAT base in Hutton et al. – authors' calculations based on data provided by the IMF.

Actual VAT revenue

Total actual VAT revenue in this study is taken from official revenue reports. We understand that official revenue reports in Ethiopia are reported on a cash basis – i.e. payments are reported on the

date they are actually made, as opposed to the tax period to which they relate.[76] Total actual VAT revenue is closest to the measure AV1 in the IMF (undated) framework.

In order to derive sectoral VAT gaps, it is necessary to calculate VAT revenue by sector. Calculating VAT revenue by sector in Ethiopia is complicated by the five administratively distinct VAT systems (federal domestic VAT, regional VAT, VAT withholding, import VAT and VAT refunds) and the varying quality of administrative data across these systems. The general approach we take is to multiply the relative size of a sector in a given administrative dataset by the total VAT revenue for that administrative system. For example, if construction accounts for 30% of VAT refunds in the VAT refund administrative data we have access to, but the VAT refund administrative data only cover 50% of actual VAT refunds, we extrapolate and assume that construction accounts for 30% of actual VAT refunds. This approach differs markedly from that of Hutton et al. (2019). They do not provide documentation in the report or in their Excel files on how they calculate VAT revenue by sector, but the large share of revenue allocated to the 'unknown' sector indicates that they do not extrapolate if administrative data do not match aggregates.

For **federal domestic VAT**, VAT revenue by sector is derived from administrative microdata on VAT payments (to federal tax offices). The sum of VAT paid in the administrative data is around 90–95% of officially reported VAT paid from 2018/19 onwards, but only 60–70% prior to 2018/19, due to a change in the specific administrative data source in 2018/19. The change in data source leads to a sharp change in sector composition: the wholesale/retail sector accounts for 23% of VAT revenue in the dataset for 2017/18, but only 15% of VAT revenue in the dataset covering 2018/19. The share of VAT revenue attributed to all other sectors tends to rise in response. The change in data source is indicated by a dashed line in the compliance gap panel of Figure 4.8.

Hutton et al. (2019) also note that unrefunded VAT credits in Ethiopia appear to be too large, at 1.8% of GDP in 2017/18, based on administrative data on VAT declarations. If this is the case, the estimated VAT gap based on VAT payments would be too large, as taxpayers offset their VAT liabilities with credits accumulated from previous periods and can therefore pay nothing. A closer look at this issue suggests that this is likely to be an artefact of the data, rather than a real problem. There are two sources of data on federal VAT declarations prior to 2018/19 – 'assessed' and 'submitted'. Excess credits are only significant in the 'assessed' data, as tax authorities appear to use this column to indicate the amount that has already been paid for the month that the VAT declaration corresponds to. In the 'submitted' data, the excess credits are in the range of 0.2–0.5%

[76] The exception is for VAT refunds, where the officially reported figure is the amount allocated for VAT refunds and not the actual amount of VAT refunds made.

of GDP, which is much smaller than the IMF estimates. Excess credits in VAT declaration data after 2018/19 (where there is no distinction between assessed and submitted) are also small.

We do not have access to administrative data for **regional VAT**, and we do not believe that high-quality data exist for all regions. As regional VAT is collected from unincorporated firms, which tend to be smaller, we use the sector composition of federal VAT taxpayers with a turnover of less than 2 million birr per year and multiply this sector composition by the aggregate regional VAT revenue. For example, if wholesale/retail firms account for 50% of federal VAT receipts among firms with a turnover of less than 2 million birr in a given year, and regional VAT revenue is 0.5% of GDP in that year, we assume that the wholesale/retail sector pays 0.25% of GDP in regional VAT. This is based on the strong assumption that the sectoral composition of unincorporated enterprises in the regions is the same as that of small federal enterprises.

Import VAT is derived from customs microdata from 2018/19 onwards and the UN's Comtrade database prior to 2018/19 (due to the poor quality of customs microdata prior to 2018/19, as shown in Figure E.1). The UN's Comtrade database does not report import VAT paid. Instead, the effective VAT rate for a given HS6 code is calculated using the first year of customs microdata (2018/19), and multiplied by the total CIF value of imports by HS6 codes for prior years. This is then scaled upwards or downwards so that the sum of import VAT by HS6 estimated from Comtrade matches officially reported import VAT.[77] Import VAT by HS6 by year is then converted to import VAT at the commodity level, using a custom mapping between HS codes and commodity codes reported in the supply and use table. Import VAT by sector is then derived using the supply and use tables: for example, if the supply and use tables say that 40% of wheat imports are made by the wholesale/retail sector, then it is assumed that 40% of import VAT on wheat is paid by the wholesale/retail sector. This relies on the relatively strong assumption that all sectors pay the same effective tax rate on imports, which is unlikely to be true as we do observe substantial within-good variation in effective tax rates in the customs data. However, this is the most reliable way to derive import VAT by sector, as there is no industry identifier in the customs microdata and it is very difficult to link customs administrative data to domestic administrative data.

The treatment of **VAT withholding** has changed significantly. We allocate VAT withholding revenue to the withholdee, whereas it appears that Hutton et al. (2019) allocate VAT withholding revenue to the withholding agent. The disadvantage of Hutton et al.'s approach is that withholding agents must be identified in the model: for example, if withholding agents purchase a large share of the output of the construction sector, the model must account for the fact that the construction sector's VAT liability is going to be smaller given VAT withholding. Hutton et al. assume that

[77] Precisely, for years prior to 2018/19, $ImportVAT_{ct} = \delta_t \times \tau_{c,2018/19} \times M_{ct}$, where M_{ct} are the CIF value of imports of commodity c in year t, $\tau_{c,2018/19}$ is the average VAT rate on commodity c as a percentage of the CIF value in 2018/19, and δ_t is a scaling parameter such that $\sum_c \delta_t \times \tau_{c,2018/19} \times M_{ct} = ImportVAT_t$ from official reports.

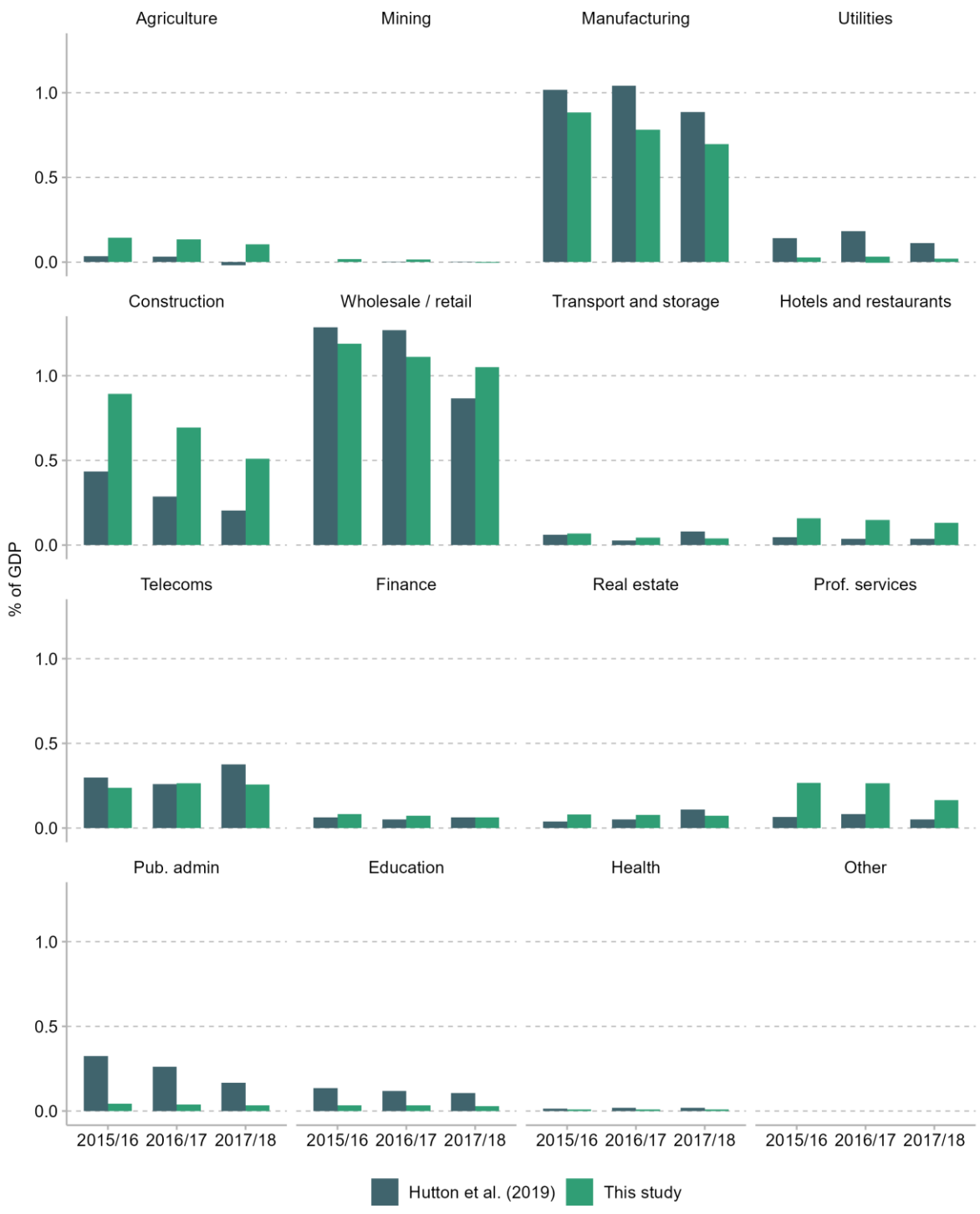
only the inputs of the public administration sector are subject to VAT withholding. However, state-owned enterprises (which are all withholding agents) are also dominant in the telecommunications, transport, manufacturing and construction sectors, though it is more difficult to put a number on how large they are within those sectors. Instead of estimating the share of inputs in those sectors purchased by VAT withholding agents, we believe it is simpler to reallocate VAT withholding revenue to the withholdees. This is possible because the post-2019 VAT declaration requires taxpayers to report withholding credits (i.e. how much VAT was withheld from them by withholding agents). We use these data to allocate VAT withholding revenue to sectors. For example, in 2019/20, around 70% of VAT withholding credits were claimed by the construction sector. Therefore, we allocate 70% of the official total VAT withholding to the construction sector. This is based on the assumption that the distribution of VAT withholding credits in the VAT declaration administrative data matches the true distribution of VAT withholders, which may not be the case if certain sectors are more or less likely not to file a VAT declaration or to fill in the VAT withholding credit box. The data are only available from 2019/20 onwards, so we use the 2019/20 distribution for all earlier years.

VAT refunds by sector are derived from administrative data on VAT refund payments. Administrative data on VAT refunds appear to cover only 40–60% of the value officially earmarked for VAT refunds. This may indicate limitations in the administrative data on VAT refunds or that the full amount allocated for VAT refunds is not used.

Figure D.2 compares how VAT revenue by sector in this study compares with that in Hutton et al. (2019), for the three years of overlap (2015/16 to 2017/18). As discussed earlier, although we do not know exactly how Hutton et al. calculate VAT revenue by sector, it is likely they do not extrapolate in the case of missing data. This results in around 40% of VAT revenue being allocated to the 'unknown' sector. To focus the comparison on other methodological differences, Figure D.2 reallocates VAT revenue from the unknown sector to other sectors in proportion to their size (see figure note).

The largest differences in revenue are for the construction and public administration sectors, which is likely a result of our choice to allocate VAT withholding revenue to withholdees (which are largely in the construction sector), away from the VAT withholding agents (many of which are in public administration). There are also discrepancies in a number of other sectors, which may reflect the differences in underlying data sources or the exact way that missing data are reallocated across sectors.

Figure D.2. Comparison of VAT revenue by sector between this study and Hutton et al. (2019)



Note: Hutton et al. allocate a large share of revenue to the unknown sector. In order to facilitate comparison, we reallocate the revenue that Hutton et al. report in the unknown sector to other sectors using the formula $NewRevenue_{s,t} = OldRevenue_{s,t} \times (1 + \frac{Revenue_{unknown,t}}{\sum_s OldRevenue_{s,t}})$.

Source: This study – administrative tax data from the Ministry of Revenue. Hutton et al. (2019), table 6.

Policy and model structure

The 'policy structure' refers to the set of inputs and assumptions related to the implementation of VAT in Ethiopia. The 'model structure' here refers to the mechanics of the model. This section discusses the most notable modifications to the policy/model structure of Hutton et al.'s model.

The most important change is the treatment of agriculture. Hutton et al. assume that for all agricultural sub-sectors (except cut flowers and forestry), 80% of value added is accounted for by producers below the VAT registration threshold. The model documentation does not specify why this figure was chosen. The 2015/16 Social Accounting Matrix differentiates between agricultural production by households and by non-households. We assume that the entirety of the former is either subsistence agriculture or under the VAT registration threshold, and that the entirety of the latter is above the VAT registration threshold. This results in 70% of the output of the agricultural sector on aggregate being under the VAT registration threshold. However, this figure is generally higher for exempt agricultural commodities. For example, 99% of teff, 98% of pulses and 95% of wheat is produced by households rather than non-households in the Social Accounting Matrix. This is in line with other estimates (Temesgen and Aweke, 2023), and is higher than Hutton et al.'s blanket assumption of 80%.

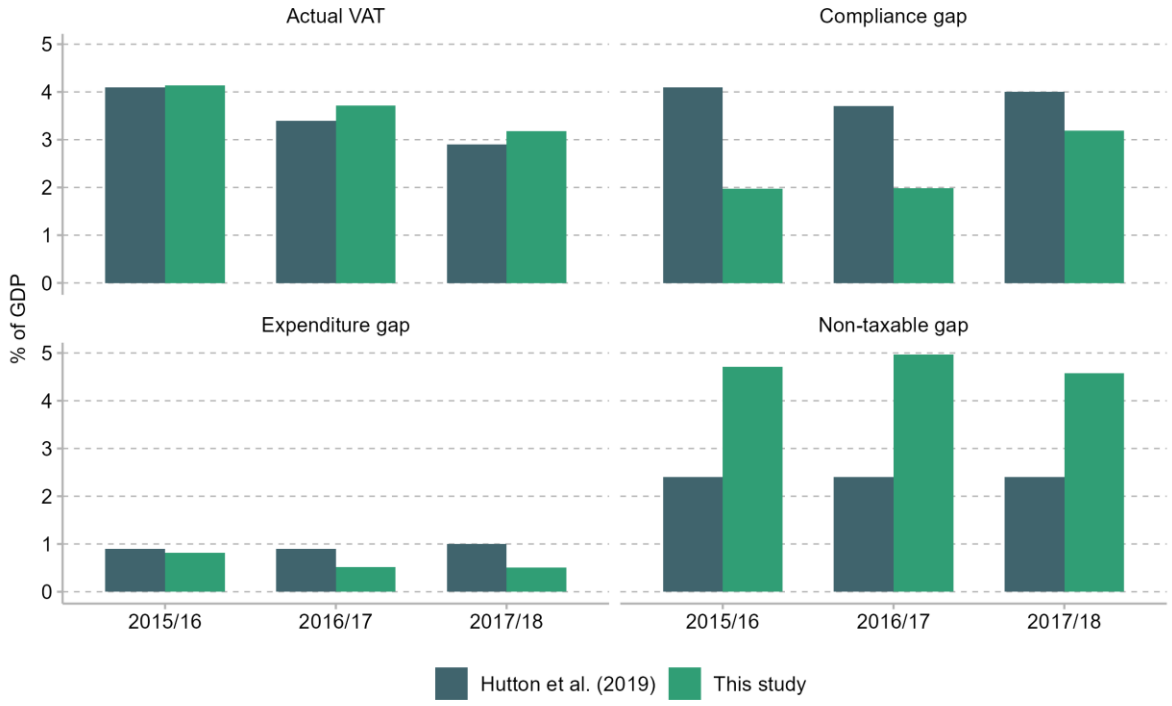
Other major changes to the policy structure and the model include:

- New VAT exemptions for eggs, pasta, baby formula, vegetable oils (in addition to palm oil, which was already exempted) and sugar. These were applied to imported versions of these products in June 2020 and imported and domestically produced versions of these products in September 2021. To avoid the complexity of having to treat imported varieties separately from domestically produced varieties, we assume that these products were fully standard-rated prior to 2021/22 and became fully exempt in 2021/22.
- Construction of public housing is exempt in Ethiopia. Hutton et al. assume that 35% of construction in Ethiopia is for construction of public housing and therefore exempt. We use a value of 3%. This is based on information from Kihato and Gitu (2023), which states that around 30,000 public housing units were produced by the state-led Integrated Housing Development Programme, and a typical unit cost is 1.2 million birr. Kihato and Gitu (2023) do not specify which date that cost estimate comes from, but 30,000 times 1.2 million birr is equivalent to 3.8% of the gross value added of the construction sector in 2021/22 or 2.5% in 2022/23. We take 3% as the midpoint.
- Mosquito nets are exempt in Ethiopia. Hutton et al. assume that 10% of textiles are mosquito nets. We set the value to 1%, given that around 1% of imported textiles were mosquito nets in 2021/22 according to customs data (and assuming that the share for domestically produced mosquito nets is similar).

- Seeds are exempt in Ethiopia. Hutton et al. split each agricultural commodity into output and seeds. Take the example of tobacco leaf, which is a distinct commodity category in the supply and use table. It is produced by the tobacco leaf production sector, which is a distinct sector in the supply and use table, and a major consumer of tobacco leaf is the tobacco products sector. As with all other agricultural commodities, it is split so that 90% of the commodity is tobacco leaf (output) and 10% of the commodity is tobacco leaf (seeds). However, the splits are not adjusted based on who is producing or consuming tobacco leaf. This results in a situation in which, when the tobacco products sector purchases tobacco leaf, it is assumed that 90% of it is tobacco leaf (output) and subject to VAT, and 10% of it is tobacco leaf (seeds) and so exempt. Instead, we assume that all inputs and imports for the tobacco leaf production sector are tobacco leaf (seeds), and everything else is tobacco leaf (output). We use the same logic for all other agricultural commodities where there is a distinction between seed and output. This distinction is arbitrary for products in which both the output and the seed are exempt (e.g. teff).
- As discussed above, VAT withholding revenue is allocated to the withholdee rather than the withholding agent. The advantage of this approach is that the model does not require any assumptions on the proportion of inputs of each sector that are subject to withholding.
- The amount of input VAT that a sector can reclaim is affected by a parameter λ_c (IMF (undated)), or the 'share of inputs by taxpayers produced by taxpayers'. This captures the idea that input VAT is not reclaimable on purchases from VAT non-registered firms. For example, if 99% of teff in Ethiopia is made by households (which are assumed to be non-registered for VAT), then very little input VAT can be claimed by intermediate producers (e.g. restaurants, flour mills) on their purchases of teff. As the registration threshold is part of the normative structure, this would be the case even in perfect compliance and if teff was standard-rated for VAT. We believe that the calculation of λ_c in the IMF's VAT gap model (and its implementation in Ethiopia by Hutton et al.) is subject to a number of shortcomings and errors. We modify the calculation of λ_c to make it closer to what we believe the IMF was trying to do, but do not go into the technical details here. Our version of λ_c makes the non-taxable gap (very slightly) larger and the expenditure and compliance gaps (very slightly) smaller.

Figure D.3 shows the difference in actual VAT, the compliance gap, the expenditure gap and the non-taxable gap between this study and Hutton et al. (2019). Figure D.4 shows how potential VAT (under the current policy structure) compares between the approach in this paper and the Hutton et al. (2019) study. Only potential VAT by sector under the current policy structure is compared because Hutton et al. do not report potential VAT by sector under the normative and comprehensive policy structures.

Figure D.3. Comparison of aggregate actual VAT, compliance gap, expenditure gap and non-taxable gap between this study and Hutton et al. (2019)

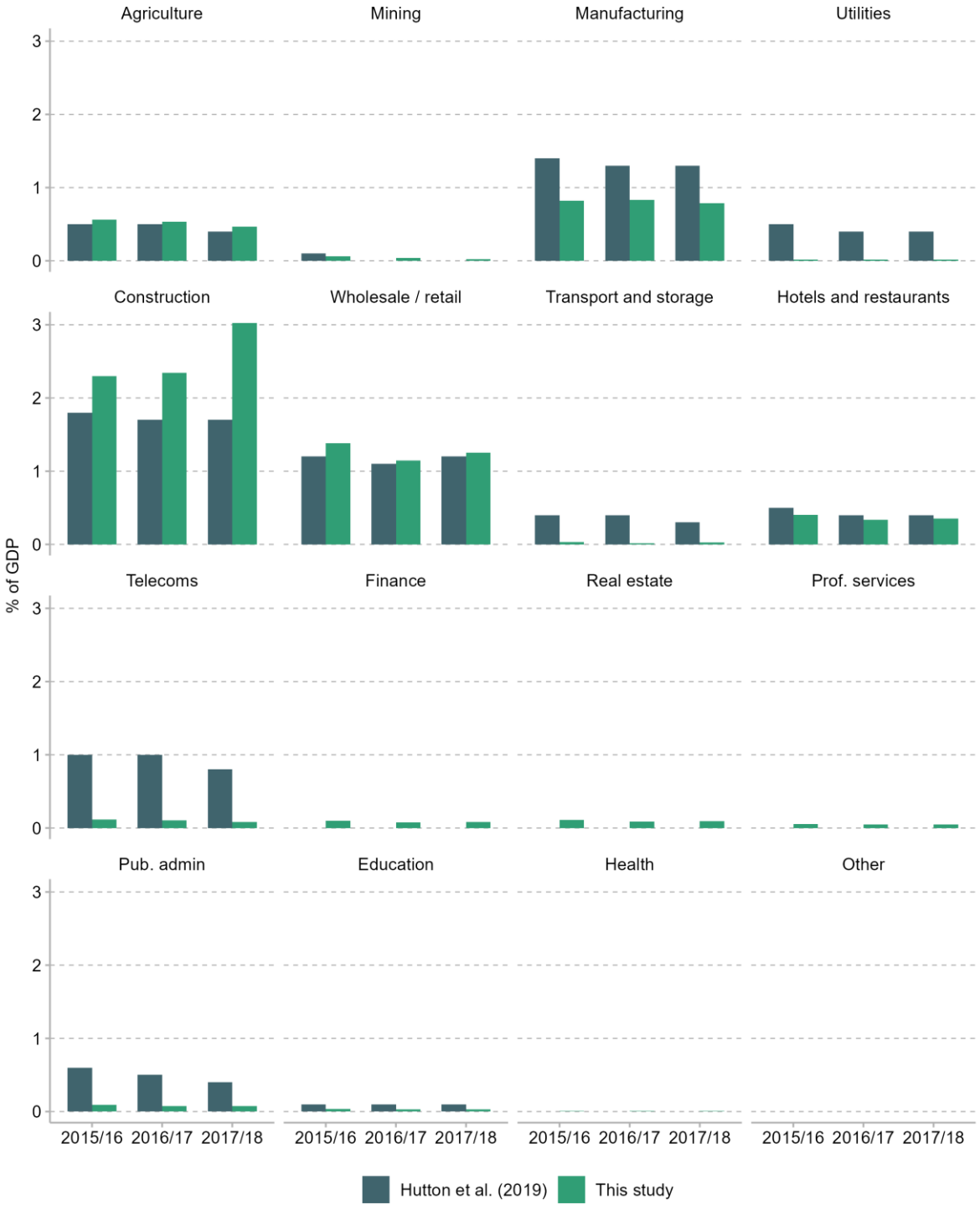


Source: Hutton et al. (2019), table 12.

The main differences are that the aggregate compliance and expenditure gaps are larger in Hutton et al. than in this study, while the non-taxable gap is smaller. At the sectoral level, the potential VAT from telecommunications, utilities, manufacturing, transport/storage and public administration is larger in Hutton et al. than in this study, while potential VAT from construction and wholesale/retail is smaller.

We believe that there are three main reasons for the large discrepancy in results. First, Hutton et al.'s underlying data source is the 2010/11 supply and use table, whereas we use the 2015/16 Social Accounting Matrix. Although both studies extrapolate these underlying data sources using national accounts data, it is possible for there to be issues with the extrapolation process. As discussed earlier, Hutton et al. estimate the potential VAT base for agriculture under the comprehensive system (meaning the VAT base if there were exemptions, no registration threshold and full compliance) to be 10.5% of GDP in 2017/18. This seems far too low, given agriculture made up 33% of GDP in that year. Although the potential VAT base under the comprehensive system is not necessarily the same as a sector's contribution to GDP, this estimate seems far too low. Our estimate is 25.8% of GDP. As agriculture is largely non-taxable, this increases the non-taxable gap at the expense of the expenditure and compliance gaps.

Figure D.4. Comparison of potential VAT under the current policy structure between this study and Hutton et al. (2019)



Note: For this study, 'Utilities' refers to the sum of electricity and water.

Source: Hutton et al. (2019), table 18.

Second, data from the 2015/16 Social Accounting Matrix allow us to distinguish between agricultural production by households and agricultural production by non-households (we do not know whether the 2010/11 supply and use table makes a distinction, but Hutton et al. do not). As household production is under the VAT registration threshold (which is classified as non-taxable by the IMF's methodology), this further increases the non-taxable gap at the expense of the expenditure and compliance gaps.

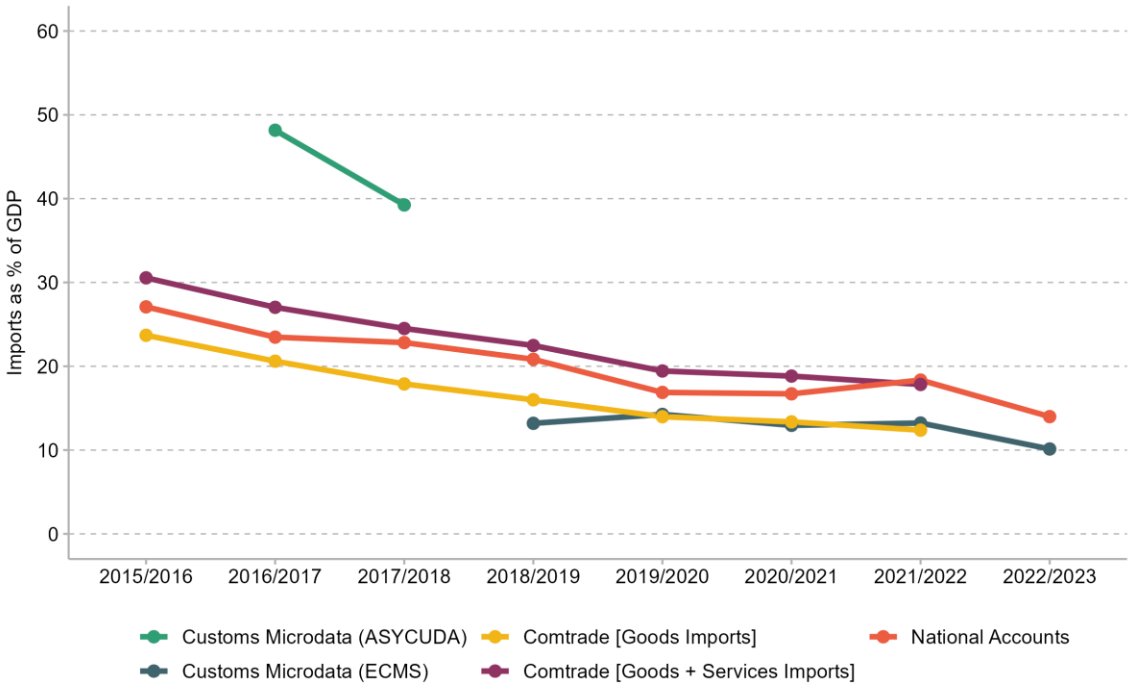
The differences in potential VAT in the public administration and construction sectors reflect our choice on how to treat withholding: potential VAT withholding revenues are allocated to the public administration sector in Hutton et al., whereas we allocate them to the sector in which VAT withholdees operate (which is mostly construction).

Appendix E. Imports and import composition in Ethiopia

Data sources for the analysis of imports

This report uses three sources of information on imports in Ethiopia: customs microdata (which are at the shipment level), UN Comtrade data (which include the total value and volume of imports by HS code) and the total level of imports from Ethiopia's national accounts. In 2018/19, Ethiopia switched from the customs reporting system 'ASYCUDA' to the customs reporting system 'ECMS'. In 2016/17 and 2017/18, the total level of imports recorded in the ASYCUDA system is much higher than the level of imports reported in the national accounts and in Comtrade (see Figure E.1). As we are not able to explain why this is the case, we do not carry out any analysis based on customs microdata before 2018/19. ECMS is very close to the CIF value of goods imports in Comtrade. The total value of goods and services imports in Comtrade is slightly higher than the value of imports reported in the national accounts, which may be due to differences in the way imports are reported in the two systems.

Figure E.1. Imports as a % of GDP from different data sources



Note: Comtrade data are originally available at the calendar-year level in USD. They are first converted to ETB using the average annual official exchange rate and adjusted to the Ethiopian fiscal-year level such that the value for 2015/16 is 50% of the value for 2015 and 50% of the value for 2016. The CIF value is reported for imports from microdata and from Comtrade.

Source: Customs microdata – Ministry of Revenue. Comtrade – United Nations (2024). National accounts – Ministry of Planning and Economic Development. Exchange rate – World Bank (2023b).

The effective tax rate on imports

This section formalises the argument made in Box 4.2. The overall effective tax rate on imports can be written as

$$ETR_t = \sum_c \tau_{c,t} \times \frac{M_{c,t}}{M_t}$$

where c is a commodity (e.g. HS6 code), t is year, $\tau_{c,t}$ is the effective tax rate paid on commodity c in year t (which itself depends on both the statutory tax rate for commodity c and the percentage of shipments of commodity c that benefit from exemptions / reduced rates), $M_{c,t}$ is the CIF value of imports of commodity c in year t, and M_t is the CIF value of total imports in year t.

Let $s_{c,t} = \frac{M_{c,t}}{M_t}$ refer to each commodity's share of total imports in that period. The change in the overall effective tax rate on imports between 2015/16 and 2022/23 can be written as

$$\begin{aligned} ETR_{22} - ETR_{15} &= \sum_c [\tau_{c22} s_{c22}] - \sum_c [\tau_{c15} s_{c15}] \\ &= \sum_c [\tau_{c22}(s_{c22} - s_{c15}) + \tau_{c22} s_{c15}] - \sum_c [\tau_{c15} s_{c15}] \\ &= \sum_c [\tau_{c22}(s_{c22} - s_{c15})] + \sum_c [(\tau_{c22} - \tau_{c15}) s_{c15}] \end{aligned}$$

Put simply, the change in the overall effective tax rate between 2015/16 and 2022/23 can be expressed as the change due to the change in the composition of imports (the first summation on the bottom line) and the change due to the change in within-good effective tax rates (the second summation on the bottom line). We do not know τ_{c15} because of the poor quality of customs data before 2018/19, but it is possible to calculate the changing composition of imports. Using the merged Comtrade–ECMS dataset, $\sum_c [\tau_{c22}(s_{c22} - s_{c15})]$ is –0.04 percentage points.

The overall effective tax rate on imports increased from 8.8% to 10.1%, or 1.3 percentage points, between 2015/16 and 2022/23. As the composition effect is minimal, this increase must be almost entirely explained by increasing effective tax rates within goods categories.

This raises the question 'Why have within-good effective tax rates risen?'. Statutory tax rates have generally been cut, as discussed in Box 4.2. One potential explanation is that within a goods category, public sector importers tend to pay lower effective tax rates than private sector importers due to preferential rates or more favourably treated commodities. As public sector spending and especially public sector investment have fallen, the public sector accounts for a smaller share of imports within a specific goods category and therefore the effective tax rate on that category has increased.

This explanation requires two statements to be true: that public sector importers pay a lower effective tax rate than other importers for the same good, and that the share of public sector imports in total imports has fallen over time. The first statement can be verified: in 2022/23, public sector importers paid, on average, an effective tax rate 14 percentage points lower than private sector importers for the same good.[78] We cannot verify the second statement, as good-enough-quality customs microdata do not go back to 2015/16 and it is not possible to identify public sector imports using Comtrade. However, the statement seems plausible given that the fall in imports was driven by a fall in imports of capital goods, which coincided with the steep fall in public sector investment.

[78] This number is the weighted average of the difference in public sector and private sector effective tax rates, weighted by the CIF value of imports, or $\frac{1}{M}\sum_c(\tau_c^{Pub} - \tau_c^{Pri}) \cdot M_c$. An imported shipment is categorised as being imported by the public sector if the importer is either a public enterprise or a government institution. Public enterprises / government institutions are identified in the customs data if their name also appears in the names of VAT withholding agents (as all VAT withholding agents in Ethiopia are in the public sector), or if the last three digits of the CPC code associated with the shipment correspond to 401, 403, 407, 410, 411, 413, 441 or 450 (which refer to government imports).