Fiscal policy in African development:
'qual-quant' analysis with special reference to Zambia

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Abstract

This thesis focuses on some of the most urgent and consequential issues in fiscal policy and development in Africa, with special reference to Zambia. In Chapter 2, the main research problem is how to get developing income countries out of the debilitating problem of low tax – low public expenditure low – development. We find possible merits in the 'fiscal contract' approach – suggesting that higher tax revenues can be achieved by improving accountability and offering better value for money in public expenditure. However, apparently the adoption of the value-added tax has not had a significant impact in spite of being regarded as the most significant innovation in tax policy design of the past millennium, whereas the establishment of ARAs has only had a contemporaneous positive effect, which on our analysis, dissipates over the medium term.

In Chapter 3, we seek to understand whether investment in human capital, including public spending on education, is effective in promoting economic growth as suggested by 'endogenous growth theory'. We also consider new issues in human capital accumulation, in particular 'quality' *versus* 'quantity. We find strong evidence that the 'quality' (measured by repeater rates), rather than the 'quantity' (school enrolments) plays a major role and that policies of the past decades which have stressed 'quantity' may have undermined quality, and therefore, growth – a scepticism shared by the 2018 *World Development Report*. Our study also finds some evidence that institutions of governance matter for growth, but we find no evidence that different levels of public spending on education are differentially productive, contrary to assertions by World Bank (1986) and others.

Chapter 4 brings together the revenue and expenditure dimensions of fiscal policy, to consider why fiscal deficits are becoming difficult to manage and control, especially in Africa. The evidence indicates that Africa's democratisation has expressed itself in increasingly weak government ability to control fiscal deficits because in most African '*political business cycles*' the pre-election fiscal boost is not counterbalanced by the post-election cutback. The ability to control fiscal deficits, especially in natural resource-dependent countries, has been compounded by government's inability to effectively tax powerful resource corporations and poor management of

resources through wasteful spending, particularly on uneconomic and unsustainable programmes. On the international scene, fiscal discipline is being further compromised by the erosion of the restraining influence of the IMF and aid donors, because low-income countries can now finance deficits using loans obtained from China and other sources and manage to postpone critical fiscal adjustments.

Dedication

This thesis is dedicated to

my late wife, Nabiana, who persuaded me to pursue these studies, but never lived on to witness the fruition of our dream,

and

my two lovely children, Moses and Mulenga, who endured long periods of my absence.

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Chapter 1
Introduction

1.1 Summary of argument

The economics literature has long asserted that fiscal policy – how the government designs and utilises policies relating to taxation, public spending and borrowing – plays a major role in shaping a country's development (Diamond, 1965; Sato, 1967; Feldstein, 1974; Chamley, 1986). Several arguments for the developmental role of fiscal policy have been advanced, *inter alia*, fostering economic growth, better income distribution and stabilisation. Some commentators have argued that "fiscal policy can contribute to both development miracles and enduring stagnation" depending on how it is designed and implemented (Easterly and Rebelo, 1993: p.418). Until the 1990s fiscal policy especially in developing countries, mainly promoted by Washington institutions, was largely confined to a narrow range of objectives focussing on short-term macroeconomic stabilisation and income distribution, but more recently its objectives in these countries have broadened to include other aspects such as building effective states, promoting employment and growth, accelerating the rate of capital formation and investment and achieving inclusive growth that is able to reduce poverty and inequality. In resource-rich countries where natural resource wealth has been linked to poor development outcomes, fiscal policy has been identified as a potential instrument in the effort to escape the '*natural resource curse*' (Mosley, 2017). Following the macroeconomic problems of the 1970s through the 1990s, there has been increased attention towards some of the most tenacious and consequential aspects of fiscal policy in developing countries, in particular how to improve domestic tax revenue performance which has stubbornly remain lower than other countries for decades, accelerating and sustaining the rate of growth and addressing rising and persistent public debt and unsustainable fiscal deficits.

The use of fiscal policy, in addition to other policies, to achieve various developmental objectives has accomplished uneven success across the global, but it is developing countries which have continued to lag behind other countries in many areas, whether it is fiscal capacities, rates of economic growth and macroeconomic stability, income inequality, poverty or fiscal sustainability positions – most of which require urgent and appropriate policy solutions. For some while, the

international development community and independent analysts have been aware of these challenges and have sought to analyse and tackle them.

In this thesis, we seek to understand fiscal policy in African development, and how its beneficial impacts can be improved. Although there is a large number of studies identifying various linkages and causes between different indicators of fiscal policy and development (from different perspectives), we focus on some the most urgent, tenacious and consequential aspects where very sparse research exists or empirical findings are inconclusive or have scarcely been tackled by the empirical literature. Identifying and filling some of the gaps in our current knowledge on the developmental role of fiscal policy will not only contribute towards our better understanding of the fiscal policy-development connection but will also certainly contribute towards designing policies which can contribute towards addressing some of these development challenges. The broad objective of this thesis is to contribute towards this goal, and to accomplish this it has substantively been designed as three essays on different but interrelated aspects of fiscal policy, focusing on: tax revenue performance and how it can be improved; effectiveness of investment in human capital, including education public expenditure, since it has been given a pride of place in growth literature by Romer (1989) and other 'new growth theory' advocates; and why budget deficits are getting out of control, especially in Africa.

Although the focus is on the economically backward continent of Africa in general, we have also made special reference to Zambia[1], where recent trends show a declining tax-to-GDP ratio, slowing annual economic growth rates, rapidly rising public debt and fiscal deficits getting out of control, the country being reclassified by the IMF in 2015 as among the countries at the highest risk of debt distress[2] and most recently, all the reputable international rating agencies (Moody's, Standards and Poor's and Fitch) having downgraded its credit rating. Our approach has, therefore, been partly informed by the need for the sponsors of my studies to benefit from the findings of this research.

[1] My PhD studies were sponsored by the Ministry of Finance in Zambia, as part of the effort to build government research capacity in a broad array of economic areas but more fundamentally in the fiscal policy and development fields.

[2] The IMF and World Bank classify a country as being at the highest risk of debt distress when it is experiencing difficulties in servicing its debt; accumulating arrears; when there are strong indications of a high probability debt restructuring; and when the risk of material losses to investors in the event of a default looms high (IMF, 2019)

1.2 Motivation of the thesis

As mentioned earlier, this thesis focuses on three different but interrelated aspects of fiscal policy, which are relevant to our better understanding of the relationships between fiscal policy and development in a developing country context. Our intention here is to analyse these relationships and their implications and propose appropriate policy recommendations for addressing current obstacles to the prosperity of millions of people living under pernicious conditions in the developing world.

The first research problem we focus on one of the most intractable problems in development, how to improve tax revenue performance in developing countries, because it is impossible to achieve development and prosperity without an effective state and a crucial element in building an effective state is building an effective tax system (di John 2006, Bräutigam *et al*., 2008, Besley and Persson 2013). However, many of the poorest countries of the world have been unable to construct effective systems of taxation and thence continue to face the risks of being left further behind in development, as the gap between the poorest and other countries widens.

This thesis also focuses on the role of public expenditure on education and human capital in promoting growth, because 'new growth theory' advocates assert that these are some of the essential ingredients in the generation of technological change and thence the growth of the economy (Romer, 1989; Barro, 1991), and also because rapid and sustained economic growth has been identified as the single most important instrument in the fight against poverty and inequality (UN, 2015). However, as we will see later on, the evidence on this relationship remains inconclusive. What is even more disturbing is that policies which have been promoted in developing countries and have been a central part of development strategies, such as expansion of school enrolments, have become controversial because they have not been able to guarantee higher growth rates. The *2018 World Development Report* is now sceptical that education policies of the past five decades or so have not been successful towards achieving proper learning. However, it remains unclear whether such policies also affected the quality of education and therefore growth. The analysis here is motivated by the need to better understand factors that may have hampered

student learning and possibly growth, but also contribute in shaping educational policies that can lead to more learning and growth.

In the final core chapter, the research problem we seek to explore is why fiscal deficits are getting out of control, especially in Africa, as can be observed from Table 4.1, in spite of the considerable macroeconomic implications. Large and persistent fiscal deficits profoundly concern policymakers and development agencies because of their economic costs including driving public debt into unsustainable levels, loss of policy flexibility to conduct prudent fiscal policy, loss of confidence in the economy and the damage to a country's competitiveness. Low-income countries experienced large and persistent fiscal deficits, relative to other countries, leading to macroeconomic instability especially during the 1970s and 1980s. Although fiscal imbalances and public debt ebbed later the 1990s and early 2000s, they have recently returned in many low-income countries causing considerable macroeconomic problems. This thesis is motivated by the need to better understand what might be contributing towards the increasing weakness in government ability to control fiscal deficits.

1.3 Common features of approach

As part of our contribution to the literature, and because of the paucity of the data in Africa, we have adopted a two-track approach in all our substantive chapters called 'qual-quant'– which is rarely employed in similar studies – combining panel data regression analysis, as the main analytical framework (quantitative approach), with a more detailed analysis of a country case study of Zambia (qualitative approach) in the final section of each chapter. This approach enables us to go beyond the general findings commonly generated from regressions and consider the applicability of such findings to a country situation (Zambia in this case), but more fundamentally, through this qualitative approach, try to identify particularities and causal factors which may underlie such findings but do not typically emerge in econometric analysis. Thus, the qualitative analysis helps to validate, or in some cases throw into question, some of the general findings from the cross-country regressions.

Across all the three core chapters, we have used the same sample of countries from Africa, with data on key variables primarily derived from the World Bank's *World Development Indicators* and the IMF's *World Economic Outlook* datasets and covering the period between 1980 and 2017. Sources of data for other variables are clearly indicated in each chapter. Data for our country case study sections are from public sources such as government published documents and responses from interviews conducted in Zambia.

Because of the pernicious impact on estimates of the problem of 'omitted variable bias' caused by non-inclusion of all the relevant explanatory variables (which may not be readily available or observable), we have incorporated (where appropriate) country-specific fixed effects to account for heterogeneity arising from characteristics such as geographical, traditional and cultural factors and time-specific fixed effects in almost all our estimations to account for time-linked factors such as unobservable shocks, domestic and global crises. We have also estimated our empirical models using the statistical package *Stata/IC 14.2*, based on the Huber-White's standard errors approach, clustering standard errors at the country level to obtain unbiased standard errors and to ensure the estimates are robust to heteroscedasticity and autocorrelation. In each chapter, we conduct robustness checks to test the sensitivity of our key results to alternative estimation techniques and variable interactions.

There are many cross-cutting themes between the chapters, including the importance of politics as a driver of economic development in all the chapters; natural resource wealth and its negative consequences in Chapters 2 and 4; and the developmental role of human capital, especially education as a driver of tax revenue performance and the growth rate of the economy in Chapters 2 and 3.

Finally, as stated above the final section across all the substantive chapters is a case study with special reference to Zambia. Zambia has made strenuous attempts in many areas including democratisation, fiscal reforms, invested in human capital, and several attempts to rid its economy of fiscal deficits, but the country remains one of the poorly performing countries on the continent, and we wish to try and understand this paradox.

1.4 Presentation of thesis chapters

As indicated above, this thesis consists of three core chapters, which are preceded by an introductory chapter at the beginning (the first present one) and followed by a concluding chapter at the end. In this section, we present summaries of the three substantive chapters which outline the research problem being tackled in each one of them, possible gaps in the current knowledge, methodologies employed and our main contributions at the end of each summary.

In *Chapter 2 – Tax revenue performance in developing countries and how it can be improved* – our research problem focusses on one of the most urgent and intractable problems in development, how to get low-income out of the pernicious problem of low tax – low public expenditure – low development spiral, which they have endured for decades. It is widely acknowledged that the capacity to generate sufficient revenues is at the core of building effective states and, therefore, development. However, experience over the past decades, as can be observed in Figure 2.1, shows that despite making some progress since the 2000s, low-income countries still lag behind other countries. Without building effective systems of taxation there is a risk that the development gap between the poorest and other countries may, therefore, widen. A large number of studies, summarised in Table 2.2, has identified several causes of poor revenue performance in low-income countries. We pick up on three issues in relation to this literature. First, we focus on the quality of tax structures – recognised to play a major role in the growth of tax revenues in low-income countries (Tanzi and Vito, 1987; Greenaway, 1991; Greenaway and Milner, 1992) – and the adoption of the VAT as a key tax policy reform initiative to improve tax structures and thence revenue collection. Although its objectives are well understood, the revenue impact of the VAT remains a controversial matter as evidence from the surprisingly limited number of studies is inconclusive. In this chapter, we re-examine the effectiveness of the value- added tax towards its revenue objective in a manner that attempts to do justice, by not only re-assessing its effectiveness, but also whether this depends on certain country-specific heterogeneity like the institutional environment in which it is designed and implemented and finally identifying factors which may underlie its lack of impact.

Second, we draw attention to the idea that has been credited by international development agencies that the roots of poor revenue performance are political – governments especially of weak states are unable to raise taxes if they fear that the consequences of doing so will be immediate loss of office or worse, powerful taxpayers in such societies will seek to use any leverage they can muster to avoid paying tax, and all taxpayers will resent paying tax more particularly if they can see that others much richer than them are not doing so. Therefore, efforts have been made to mitigate the anger and political turmoil caused by tax increases by ring-fencing the process of revenue collection from political interference by transferring it from the direct control of the ministry of finance and other political authorities to ARAs (Bergman 2003; Chand and Moene 1999; Fjeldstad and Heggstad, 2012; Baskaran, 2013;). Whereas the objectives for establishing ARAs are well documented, and include improving revenue collections (Fjeldstad and Moore 2009; Ahlerup *et al*., 2015; Mo, 2019), the empirical evidence on whether their formation has resulted in improved tax revenue performance is not just limited but also less clear. Similar to the VAT, we seek to re-assess the effectiveness of the ARAs towards the revenue objective by exploring whether it depends on certain country-specific heterogeneity like the institutional environment but also whether it takes some time to materialise (with some time-lag).

The third issue, which is related to political factors, is the suggestion in the literature that political barriers to higher tax revenue performance can be overcome by framing the process of revenue collection as part of a '*fiscal contract*' in which government commits to improve accountability and offer better value for money in public expenditure (our indicator of better value for money is health and education spending) in exchange for the revenue provided by taxpayers, rather than as a coercive process (Moore 1998; Bräutigam *et al*., 2008). However, the issue of how such '*fiscal contracts*' can be formed, and what impact they have had, has scarcely been tackled by the empirical literature on revenue generation. Our main purpose here is to begin to fill this gap, by constructing and testing a picture of the process by which '*fiscal contracts'* emerge and impact on the capacity of fiscal systems in developing countries.

Our estimating models are specified and run in form of *fixed effects* and *random effects* models (common in the tax literature), on a sample of 42 African countries between 1980-2013. In addition, we account for the potential problem of endogeneity (selection bias) which may be

associated with the two policy reform initiatives (VAT and ARAs). Taken together, our main results suggest possible merits in the '*fiscal contract'* approach as a possible solution to low revenues in Africa – our two variables which are proposed to play a major role in the emergence of a stable '*fiscal contract*', democratic accountability and the value for money in public expenditure, emerge as significant correlates with tax ratios. However, in spite of being regarded as the most significant innovation in tax policy design of the past hundred years, apparently the VAT has not provided any revenue advantages, short- or long-term, to countries which have adopted them relative to those which have not, and that this does not depend on the institutional environment. We find some evidence that the establishment of ARAs may have led to contemporaneous improvements in tax ratios, but the effect dissipates over the medium to long term. However,

More insights into the evolution of tax ratios and causal factors which may underlie the process were gained from the case studies of two similar countries with different patterns in tax revenue performance: Zambia (deteriorating) and Ghana (improving). Ghana has increased revenues after adopting the value-added by increasing the tax rate three times and linking it to the national insurance scheme or education, whereas Zambia's has endured a steady decline since its adoption because of weak resistance towards demands from the urban populations for lower taxes on of basic commodities. The lack of VAT impact has also been linked to the complexity and difficulty in administering the tax in low-income countries due to the rigorous information and systems requirements. In Zambia, because of poor information management systems, there is a steady increase in input tax refunds relative to the growth in tax collections. We also find evidence that ARAs are not completely independent of political interference and are frequently too beholden to the executive. In terms of the processes by which stable '*fiscal contracts*', this is possible when there is evidence of effective public expenditure, or a formal or informal link between a particular tax base and a particular form of favoured public expenditure (as in the windfall taxes levied in the1990s and 2000s in both countries), tax revenues can improve. Also, when it is known that a level playing field for tax liability which publicly brings the large and powerful (in particular multi-national corporations) into the tax net and are paying what they owe has been established, taxpayers are more willing to pay. For instance, in Ghana all natural resource companies pay whereas in Zambia only two out of eleven mining companies pay corporation tax, which has

damaged both tax effort and the perception of equitable treatment between taxpayers in Zambia. A revised version of this section of Chapter 2, which is joint work with my supervisors, Professor Paul Mosley and Dr. Pamela Lenton, has been issued by the Sheffield Economic Research Paper Series (Lenton, Masiye and Mosley, 2017).

In Chapter 3 – *government expenditure on education, human capital and economic growth in developing countries* – the research issue we wish to tackle is whether investment in human capital, including expenditure on education, is effective since it has been credited in the theoretical literature and given a pride of place in 'endogenous growth theory' as essential in generating technological change and thence growth (Romer, 1986; Lucas, 1988; Barro, 1991). Recalling one of the key arguments of Chapter 2, we focus on the education aspect of human capital in this chapter, and draw attention to the composition of government expenditure on education as helping to determine the quality of education spending, and thus growth. A very large number of studies has explored this relationship using aggregate measures of human capital such as total education spending, school enrolments, years of schooling and literacy rates as predictors of growth, but none of these measures reliably predicts growth rates on a cross-country basis as there are as many studies reporting the lack of correlation or ambiguous findings as those finding a positive association (Benhabib and Spiegel, 1994; Pritchett, 1997). The only studies that have conducted proper robustness checks are sceptical in tone, suggesting clearly that the original 'endogenous growth hypothesis' has severe difficulties defending its claims (Levine and Renelt, 1992; Sala-i-Martin, 1997; Sala-i-Martin *et al*., 2004; Hoover and Perez, 2004).

In this chapter, we wish to examine the possibility that although aggregate measures such as government expenditure on education may not emerge as significant correlates with growth, some of its categories may differentially affect growth – as suggested by the World Bank (1986) and others – and that such clues may be found in disaggregating the variable of interest between the different levels of education, something that has scarcely been attempted (with very few exceptions such as Devarajan *et al*., 1996). We also draw attention to the importance of the 'quality' aspect of human capital which has been observed by van der Berg (2007) for South Africa and underscored in the *2018 World Development Report* but underexplored in the empirical literature. We seek to assess whether the 'quality' of education matters for growth as much as the 'quantity',

and whether previous policies which focussed on the expansion of enrolments might have undermined 'quality', and thence, economic growth. As in Chapter 2, we also consider the possible influence of institutions of governance (political factors), in particular the quality of democratic governance, in directly promoting growth or indirectly contributing to the effectiveness of public spending, since it has been suggested that well-functioning institutions can enhance the effectiveness of policies (Pritchett, 1996; Gupta *et al*., 1999; Rajkumar and Swaroop, 2008) and that political factors tend to be crucial in poorer developing countries.

Based on OLS, *feasible generalised least squares* and instrumental variable *two-stage least squares* estimations, we find no evidence that government spending on education and expansion of school enrolments have been able to create a strong footing for growth in Africa. Our analysis of disaggregated data on government spending on different levels of education could not validate the World Bank conventional wisdom and suggestions from micro level empirical studies that allocating more resources towards a particular level of education, such as primary can be more effective in promoting higher growth. However, we found very strong evidence of a statistically significant positive correlation between our measure of education 'quality', repetition rates, and growth, and that improving schooling conditions and the quality of institutions can propel educational 'quality' and therefore growth. Our preliminary findings also point to the possibility that policies that have strongly focussed on expansion of school enrolments over the past five or so decades may have compromised 'quality', confirming the scepticism expressed by the World Bank's *2018 World Development Report*.

We have gained more insights into these issues by considering the case of Zambia, where the government has closely followed development strategies promoted by the World Bank since independence in 1964: government expenditure on education has increased significantly (currently receives the biggest allocation of the budget), school enrolments especially at primary level have expanded massively, however, economic growth has not increased proportionally – which appears to be a classic case of the apparent weak association between spending, school enrolments and growth.

The evidence from our qualitative analysis reveals that explanations for the low educational impact and poor 'quality' of education can be linked to several causal factors including inefficiencies in managing public resources, including the disproportionate allocation of scarce resources (of more than 80 percent) towards teacher wages/salaries *versus* other essential and complementary educational inputs leading to a widespread lack of the necessary teaching and learning materials as well as suitable school infrastructure. The existence of weak and poorly functioning institutions of governance has also contributed towards the failure to send a significant proportion of resources designated for specific educational programmes to the intended areas (due to fraud, embezzlement and misapplication). The 'quality' of education has further been compromised by a failure to recognise that growth in school enrolments cannot effectively deliver better learning unless complementary inputs such as teaching materials, additional teaching staff and maintenance of school buildings are delivered at the same time: a problem which in Zambia has been compounded by weak budgetary discipline and switching of such resources away from the areas to which they had been destined. Finally, the Zambia case study highlights the fact that its increased democratisation has not necessarily expressed itself in better economic conditions, perhaps implying that it is not enough to just create institutions of governance but ensuring that they are properly functioning is even more crucial.

In Chapter *4 – The political economy of fiscal deficits in developing countries* – we bring together the tax and expenditure dimensions of fiscal policy to try and identify some of the key factors that may be causing fiscal deficits to get out of control, especially in Africa. Large and persistent fiscal deficits profoundly concern policymakers and development agencies because of their macroeconomic implications as they may lead to unsustainable public debt, loss of policy flexibility to conduct prudent (countercyclical) fiscal policy, a general loss of confidence in the economy and more crucially loss of a country's competitiveness.

A large number of studies has explored causes and consequences of fiscal deficits and early work in this area such as the 'tax smoothing hypothesis' emphasised the major role played by macroeconomic factors in the tendency for the deficit to deteriorate. However, following the emergence of large and persistent deficits, underlying causal influences have broadened to include political, institutional and external factors. Few studies explore factors which can cause temporary

fiscal deficits to persist and therefore exacerbate the risks of macroeconomic instability and fiscal unsustainability. We seek to identify relevant factors pertinent to small open economies of Africa which play a major part in the tendency for temporary fiscal deficits to become persistent and difficult to control. We attempt to break new ground in relation to previous work by employing the ideas of '*political business cycle*' to assess whether governments in Africa are able to implement the deflationary phase of the cycle to bring down fiscal deficits after the election as claimed by the political economy literature, and whether and how the natural resource wealth increases government weakness in ability to control fiscal deficits and therefore erodes fiscal discipline. We also consider whether the ability to control fiscal deficits depends on the relationship developing countries have with development agencies and aid donors, who finance a large portion of national budgets or on the quality of domestic institutions of governance which are expected to act as 'agencies of restraint' as suggested by Collier (1999) and others. The question of what the impact of foreign aid has been in recipient countries has been extensively explored but the evidence remains controversial. An important issue which has not been thoroughly explored in this literature is whether the availability of alternative sources of financing has possibly eroded the restraining influence of traditional aid donors and contributed to the return of large fiscal deficits in Africa in the recent past. We attempt to contribute to this area by analysing the case of Zambia.

A standard dynamic model that captures the essence of the Nordhaus-type opportunistic approach, augmented by the 'natural resource curse' propositions and a measure which captures the role of aid donors, is specified and estimated on a more recent dataset than most previous studies on Africa (1980-2016). Our cross-section regressions, conducted using Huber-White's robust *OLS* approach, *fixed effects* and the instrumental variable estimator *three-stage least squares*, confirm the incidence of fiscal policy manipulation during election years (pre-election spending increases), but that these are on average not followed up by adequate post-election cutback (as suggested by the insignificant coefficients on the two variables created to capture post-election fiscal policy). This scenario presents African governments with an unpleasant choice of surrendering to the cycle and thus causing a temporary deficit to persist. The evidence, especially in natural resource intensive countries, shows that control of deficits is compounded by increasingly weak ability to effectively tax powerful natural resource companies which, as

mentioned in Chapter 2, damages the perception of equitable treatment between taxpayers, and thence tax effort, but also that the inability to resist political pressure (often due to the weak political base of most African governments) has led to resource revenues being frequently wasted on uneconomic and unsustainable public projects which require financing when the boom is over.

The evidence from the case study has confirmed the negative conclusion that Zambia's increasing democratisation expressed itself in increasingly weak government resistance towards demands after, as well as before, elections, which increasingly compromised its ability to impose post-election deflation as election-linked cycles in deficits have been strengthening over the years (see Figure 4.3). The government's ability to control fiscal deficits has been weakened by natural resource wealth, in particular the copper booms of the 1970s and the early 2000s were channelled towards the expansion of basic services and the role of the state, expansion of poorly designed and targeted agricultural subsidies, large scale but uneconomical infrastructure projects, and public sector wages, which were difficult to rollback when the booms were over. Finally, we find that because of the poor relationship Zambia has had historically with aid donors, and more recently the increased availability of diversified sources of financing such as Chinese loans and commercial borrowing, its ability to finance deficits has not depended on the relationship with traditional aid donors. Although the country has in this way managed to dodge the restraining influence of donors, it has not completely escaped the cost of delayed adjustment: fiscal deficits have deteriorated faster than anywhere else on the continent since 2010; public debt has increased rapidly, from 21 percent of GDP in 2011 to about 60 percent by 2016; and the country is now one of the 17 nations in Africa considered to be at highest risk of debt distress.

Chapter 2

Tax revenue performance in developing countries and how it can be improved

2.1. Introduction

In this chapter, the first of the three core chapters of this thesis, and a section of which has developed into a joint paper with my supervisors issued by the Sheffield Economic Research Paper Series (Lenton, Masiye and Mosley, 2017), we consider one of the most intractable and urgent problems in development – how to get the poorest countries of the world out of the low tax-low public expenditure-low development spiral. The issue of low tax revenue performance has concerned preoccupied the international development community, independent analysts and policymakers for several decades (William, 1961; Lotz and Morss, 1967; IMF, 2011) because it is widely accepted that development is impossible without the construction of an effective state, and that a crucial element in building an effective state is building an effective tax system (Fjeldstad and Rakner, 2003; Bräutigam *et al*., 2008; Di John, 2006; Besley and Persson 2013)[3]. However, as can be observed in Figure 2.1, experience shows that low-income countries lag behind other countries and there is a concern among the development community and other commentators that without building effective systems of taxation there is a risk of low-income countries remaining trapped in low or static revenues, and since state-building drives development, there is also a risk that the gap between the poorest and other countries may therefore widen (Di John, 2011; United Nations, 2013).

[3] Besley and Persson's study of 'pillars of prosperity' argues that one of the pillars of an effective state is a well-functioning tax system, not least because the tax system underpins other institutions, public expenditure and legal institutions in particular. They argue that 'Countries that have better fiscal capacity also tend to have better legal capacity, both of which are correlated with contemporaneous GDP per capita' (Besley and Persson 2013: p.7, see also pages 31-33, 40-102, 131-138.) The case for the primacy of taxation as a development instrument has also been made by Deborah Bräutigam : 'Taxation is an underrated tool in the effort to build more capable and responsive states…Democracies are built not only on periodic elections but also on a social contract based on bargaining over the collection and spending of public revenue. [Indeed, we can argue] that taxation may play the central role in building and sustaining the power of states.' (Bräutigam 2008a; also, Bräutigam , Fjeldstad and Moore 2008:1-2).

What is particularly striking is that although there has been a marked improvement in low-income countries generally since the early 2000s (Keen and Mansour, 2009; 2010), tax revenues have remained stubbornly low in relative to high-income countries where they have been high and middle-income countries where they have improved. The international development community and independent analysts have been aware of this problem and have sought to analyse and tackle it for some while, but today it still remains one of the development policy issues in international development discourse. As can be observed from Table 2.2 below, a large number of studies has identified several factors that are associated with variations in tax revenue performance across countries. Studies of the 1960s focused on macro-economic influences, identifying the level of development, openness of the economy to foreign trade and economic policies as important determinants. By the 1980s, these studies had broadened in scope to consider the sectoral composition of the tax base including the shares of agriculture and mining, and by the millennium governance indicators had also entered the picture.

Within this huge literature, the structure of the tax system (main source of tax revenues) has been recognised to play a major role in the growth of tax revenues in developing countries. The literature has identified the poor quality of tax structures in low-income countries, which depend heavily on distortionary, narrow, unstable and low-yielding taxes such as sales and turnover taxes and in some cases trade taxes also, are a major cause of poor tax revenue performance (Greenaway, 1984; Greenaway and Milner, 1991; Stotsky and WoldeMariam, 1997). International development agencies, with the IMF in the lead[4], have sought to improve tax structures by weaning governments away from dependence on these traditional revenue sources, towards taxes on broader bases, and in particular towards the VAT. The VAT, which is credited for being broad-based, efficient and neutral on business, has now been widely adopted throughout the World. By some accounts its widespread in emergent and developing countries has been regarded as the most significant and visible innovation in tax policy design of the 21st century, while others have referred to it as a 'money machine' (Ebrill *et al*., 2001; Keen and Lockwood, 2010). However, although its objectives and advantages are well understood, the success of the VAT towards the revenue objective remains a controversial matter, as the evidence from the surprisingly limited number of

[4] The International Monetary Fund has for a long time played a leading role in supporting efforts to improve tax revenue performance in developing countries (Cottarelli, 2011: p.4).

studies is inconclusive, and what is even disturbing for policymakers is that very little is understood about what might be causing its weak or low revenue impact. The efficacy of the VAT is now receiving renewed attention from policymakers in some countries. For instance, Zambia had recently announced its intentions to abolish the VAT by June 2019 arguing that it has not lived up to its revenue promises but has been a drain on the country's resources. We attempt to expand the evidence base on the 'true' revenue impact of the VAT by assessing whether its impact takes some time to materialise or depends on certain country-specific heterogeneity. In addition, we attempt to identify possible causal factors which may underlie its lack of impact.

Analysts and development agencies also assert that the roots of poor tax revenue performance are political – governments especially of weak states are unable to raise taxes if they fear that the consequences of doing so will be immediate loss of office or worse, powerful taxpayers in such societies will seek to use any leverage they can muster to avoid paying tax, and all taxpayers will resent paying tax more particularly if they can see that others much richer than them are not doing so. Such things have damaged the perception of equitable treatment between taxpayers such that any attempt to increase taxes has created anger and political turmoil in fragile countries. This is well illustrated by the case of Bolivia in February 2003, when at a time of severe economic crisis, following an IMF recommendation, the government proposed to widen the income-tax net so as to include sections of the middle class not then liable to pay tax. This proposed tax increase had to be abandoned after a violent revolt, in which over thirty people were killed, including several members of the La Paz police (who were in the group newly included in the tax net under the IMF's proposals, and were themselves seeking to throw the proposals out). A key factor underlying the insurrection was that it became widely known that most upper-income people, especially oil and mining executives, who were due to pay income tax were not actually doing so, and this had been widely publicised in the press and on the internet[5]. In order to mitigate the anger and political turmoil caused by tax increases especially in fragile political environments, efforts have therefore been made by many governments to depoliticise the process of revenue collection by transferring tax collection from the direct control of the ministry of finance and other political authorities to ARAs (Bergman 2003, Chand and Moene 1999 , Fjeldstad and Moore 2009); and also, more fundamentally, to frame the process of revenue collection as part of a fiscal

[5] For further detail of this episode, see Mosley (2012), chapter 10, Lora (2013) and Laserna (2011).

'social contract' (Moore 1998, 2013; Bräutigam *et al*. 2008) in which government commits itself to provide public services in exchange for the revenue provided by taxpayers, rather than as a coercive process in which the state extorts taxes where it can without needing to justify or be held to account for the way in which this is done. Over the past three decades, ARAs have spread across sub-Saharan Africa on the recommendation and support of the IMF and bilateral aid donors. Surprisingly, very little research exists on whether ARAs have provided any revenue advantages in countries where they have been established, and there is currently an unresolved controversy surrounding their 'true' impact. In this chapter we seek to assess whether their impact materialises with a time lag or depend on country-specific heterogeneity. On the '*fiscal contract*' approach, as a possible solution to low tax revenue performance, we do not have any systematic evidence concerning the processes by which such '*fiscal contracts*' can be formed, and what impact they have had, has scarcely been tackled by the empirical literature on revenue generation. Our main purpose here is to contribute in filling this gap.

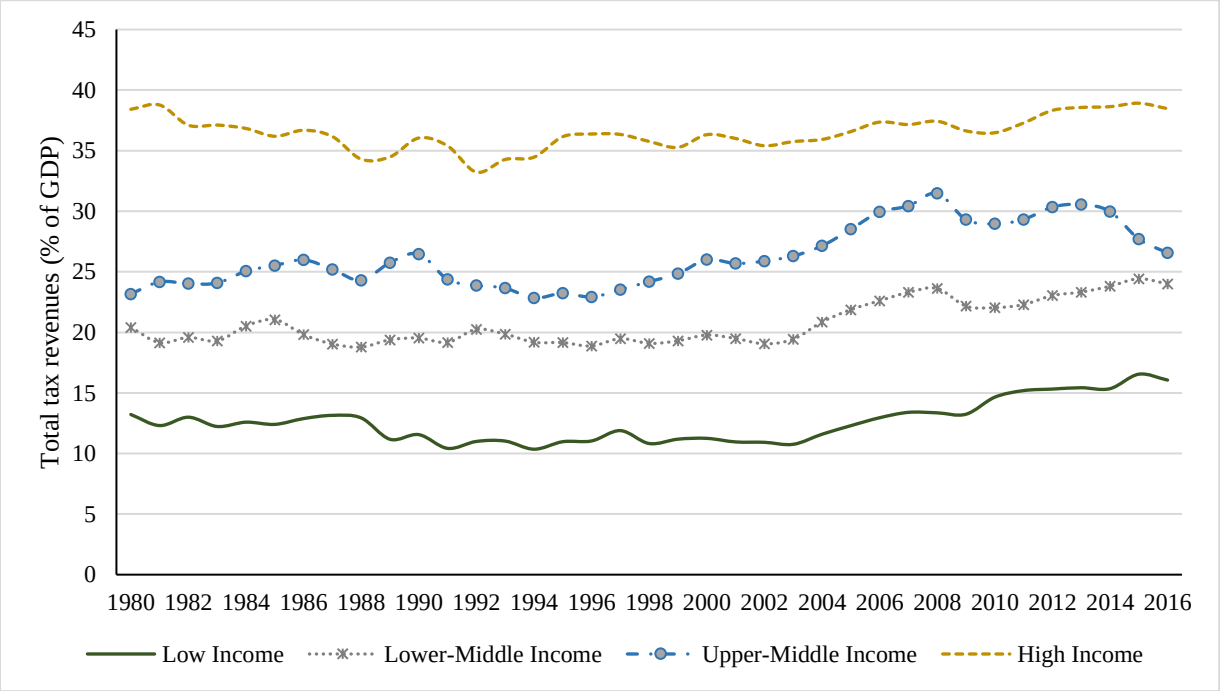
The empirical approach here, as mentioned earlier, is a 'qual-quant' analysis combining panel-data regression analysis on a sample of 42 African countries between 1980-2013, as our main analytical framework, and a comparative qualitative analysis of two countries, Ghana and Zambia in the final section. Standard estimating models commonly employed in the literature are specified as *fixed effects* and *random effects* specifications and estimated using Stata/IC 14.2 on a sample of 42 African countries between 1980-2013. We also account for a potential problem of endogeneity (selection bias) in our estimations, which may be associated with the decisions to adopt the VAT and ARAs.

The rest of the chapter is organised as follows: Section 2.2 provides a picture of the global variations and varieties of experience in tax revenue performance, followed by a summary of the literature in section 2.3. Our three main innovations and issues of interest in this chapter are discussed in more detail in section 2.3, which is followed by the empirical approach and model specifications in sections 2.4, respectively. The empirical findings are presented and discussed in section 2.5. The second part of our methodology, the qualitative analysis of Ghana and Zambia is discussed in section 2.6 and the final section is the conclusion.

2.2. Variations in tax revenue performance

It is well-documented that there are significant variations in tax revenue generation across countries and income groups, but it is the poorest countries of the world that are also the least performers. Besley and Persson (2011: p.102) show that poorer countries "tax very little" and raise much lower tax revenues, as a share of GDP, than middle- and higher-income countries. The most comprehensive datasets compiled by the International Centre for Tax and Development (Government Revenue Dataset) and the IMF (Government Financial Statistics) also show that on average tax revenues in developing countries have been the lowest (albeit improving since the 2000s) generating less than 15 percent of GDP in tax revenues over the past three or so decades (WEO, 2017; ICTD/UNU-WIDER, 2017), which is below the level recommended by the IMF as a reasonable "minimum threshold for the provision of basic public goods and services" (IMF, 2011: p.7). As can be observed from Figure 2.1, which shows average tax revenues (including resource revenues) as a share of GDP between 1980-2016, high-income countries collect the highest (averaging between 35 and 40 percent), followed by middle-income countries (between 20 and 35 percent). The data also reveals that despite being low, average tax revenue performance has been improving in low- and middle-income countries, but the increase is faster in middle-income countries than low-income as a group. These developments in tax capacities have also been confirmed elsewhere. For instance, Mosley (2015: Table 1) shows in a sample of 61 low- and middle-income countries that between 1990 and 2010, tax revenues improved in nine out of twenty low-income countries compared to 35 out of 41 middle-income countries.

Figure 2.1: Tax revenues, percent of GDP, by income groups (1980-2016)



Source: ICTD/UNU-WIDER (2018), IMF (2011). Notes: The categorisation of countries by income group follows the World Bank classification based on gross national income per capita

The issue of low tax revenue performance has also drawn a lot of attention towards sub-Saharan Africa, where for the past decades there has been marked improvement, but considerable variations still remain. In Table 2.1, we show variations in tax revenue performance in Africa, which reveal that although the average tax revenue performance increased from about 14.3 percent during the decade of the 1980s to more than 17 percent by the decade of the 2010s, there have been progress in some countries while many others have endured near-static or even declining revenues over prolonged periods. For instance, between 1980 and 2015, tax revenue collections improved in 15 out of the 37 African countries and declined in 7 countries. The evolution of tax revenue performance between the two countries of interest in this chapter, Ghana and Zambia, are also very different as shown in the shaded sections of Table 2.1, in spite of the political and economic similarities. Ghana's tax ratio rose from 6 percent during the decade of the 1980s to 20 percent in the decade of the 2010s, whereas Zambia's fell during the same period from 20 percent to 14.7 percent.

Table 2.1: Tax revenues in Africa, percent of GDP (decade averages) 1980-2015 (see notes (a), (b), (c), (d), (e)

Country		1980s	1990s	2000s	2010s	% change per decade (1980-2015)
1.	Angola	21.4	30.5	40.3	37.8	4.1
2.	Benin	10.7	10.7	14.5	14.9	1.1
3.	Botswana	22.8	25.0	25.3	24.5	0.4
4.	Burkina Faso	7.9	10.0	11.7	14.6	1.7
5.	Burundi	13.1	14.7	13.3	13.5	0.1
6.	Cameroon	10.4	9.1	14.8	12.9	0.6
7.	Cape Verde	11.7	14.1	18.7	18.5	1.7
8.	Central African Republic	11.7	8.0	7.9	7.2	-1.1
9.	Chad	3.9	5.4	8.1	13.8	2.5
10.	Comoros	10.3	11.5	11.0	11.5	0.3
11.	Congo, Dem. Rep.	8.5	2.3	5.3	10.3	0.4
12.	Congo, Rep.	28.7	11.6	7.6	10.9	-4.4
13.	Cote d'Ivoire	20.9	16.0	14.5	16.1	-1.2
14.	Ethiopia	9.0	7.8	10.6	12.0	0.7
15.	Gambia, The	12.3	12.5	12.4	14.9	0.7
16.	Ghana	6.2	8.5	12.2	14.2	2.0
17.	Guinea-Bissau	6.6	4.3	5.6	8.1	0.4
18.	Kenya	13.3	14.8	15.1	16.0	0.7
19.	Lesotho[d]	28.8	34.7	40.5	40.7	3.0
20.	Madagascar	9.9	8.8	10.4	10.0	0.0
21.	Malawi	8.8	7.8	10.1	14.9	1.5
22.	Mali	8.1	9.2	12.5	12.9	1.2
23.	Mauritius	18.4	17.2	16.4	18.6	0.1
24.	Mozambique	8.1	9.0	10.8	19.9	2.9
25.	Namibia	25.2	28.0	27.3	31.1	1.5
26.	Niger	9.5	7.2	11.7	14.4	1.2
27.	Rwanda	10.0	8.7	11.3	13.9	1.0
28.	Senegal	14.1	14.6	17.6	19.0	1.2
29.	Seychelles	34.4	31.0	26.3	29.8	-1.1
30.	Sierra Leone	4.3	6.3	8.4	9.9	1.4
31.	South Africa	22.5	24.4	26.5	27.4	1.2
32.	Swaziland[e]	14.2	20.1	22.3	24.6	2.6
33.	Tanzania	8.7	9.9	9.2	10.7	0.5
34.	Togo	22.6	12.1	14.2	17.5	-1.3
35.	Uganda	4.4	7.7	10.1	10.2	1.4
36.	Zambia	20.0	17.2	15.0	14.7	-1.3
37.	Zimbabwe	24.3	22.5	15.0	22.1	-0.5
Regional average		**14.2**	**13.9**	**15.3**	**17.1**	**0.7**

Source: ICTD/UNU-WIDER (2018). Notes: countries that have been shaded (Ghana and Zambia) will be used in this chapter as case studies to highlight why causal factors that underlie differences in the development and performance of tax revenues.

Notes: (a) The data in all the columns represent decade averages except for the column headed '2010s' which have been averaged over a 7-year period (2010-2016) as there is no consistent data beyond 2016; (b) The average tax ratios for Africa cover the average tax performance in the 37 countries in the table and not the whole continent; (c) The percentage change is the increase or decrease in tax ratios from the decade 1980/89 or the earliest available decade to the decade 2010/16. (d) and (e) These revenues may be overstated because they include transfers from South Africa that appear as South African Customs Union (SACU) tariff revenues.

The stylised statistics in Figure 2.1 and Table 2.1 clearly show that poor tax revenue performance remains an urgent and intractable issue in development, particularly in the poorest countries of the world. Because the capacity to generate sufficient tax revenues is at the core of building effective states and, thence, development, building effective tax systems has been an important policy objective in international development discourse for some while (Leuthold, 1991; Stotsky and WoldeMariam, 1997; Ghura, 1998; IMF, 2011; Di John, 2011).

2.3. Previous studies – survey of the literature

The standard empirical approach has often been cross-country panel data analysis, regressing total tax revenues as a share of GDP on various combinations of explanatory variables representing the state of the macroeconomy, level of development, quality of tax structures and sectoral composition of the tax base and several other demographic, political and governance causes. The estimated coefficients on the explanatory variables included in these regressions represent the average impact of such variables on the country's tax revenue performance. Our survey of the literature shows that efforts to analyse empirically determinants of tax revenue performance began in the 1960s with the identification of macro-economic influences such as the overall level of development and openness to international trade (Williamson, 1961; Hinrichs, 1965; 1970). In what some have described as one of the most influential studies in early tax literature, Lotz and Morss (1967) provide a theoretical basis and some early empirical findings linking revenue performance to GNP per capita and openness to foreign trade. They assert growth in "national income is often accompanied by higher rates of literacy, increased monetisation and stricter law enforcement – all of which can be expected to increase revenues" and that a country's ability to collect more taxes increases with openness to international trade because "it is administratively easier to levy and collect taxes on trade inflows and outflows than domestic transactions" (*Ibid*: p.481- 482).

From the 1970s onward, as shown in Table 2.2, several studies have explored the influence of sectoral composition of the tax base, focussing on the shares of agriculture and natural resources, especially mining, in the economy (Chelliah, Baas and Kelly, 1975; Tait and Eichengreen, 1978; Tait, Gratz and Eichengreen, 1979), and the structure of the tax system on tax revenue

performance. Most of these studies report a strong negative correlation between the share of the agricultural value addition and tax revenues, because the agricultural sector especially in poor countries is dominated by numerous small farmers who are notoriously difficult to tax (as most of them scarcely operate in the monetary economy, therefore do not keep accounts, and their activities take place in very remote places). A large share of mining (rents or exports) in the economy has also been found empirically to have a significant negative influence on tax revenue and has been seen as one manifestation of the 'natural resource curse' (Mosley, 2017). Consequently, during the 1990s and 2000s indicators of institutions of governance entered into the picture, including corruption, voice, political regimes and rule of law (Tanzi and Davoodi, 1997; Ghura, 1998; Gupta, 2007; Thornton, 2008; Bird *et al*., 2004, 2012; Le *et al*., 2012; Ehrhart, 2012). In one very recent study (Langford and Ohlenburg, 2016) democratic accountability has also been explored (as reported in the bottom part of Table 2.2). Although theoretical work linking institutional factors to taxation started much earlier, with the influential work of Meltzer and Richard (1981) who proposed a model linking the increase in government taxes to "the demand for income redistribution by voters" (Meltzer and Richard, 1981: p.924), empirical studies did not become popular until the 1990s and 2000s. The most consistent story emerging from studies of governance in relation to tax revenues is that high levels of corruption are generally associated with lower tax ratios.

Studies have also identified political factors as causes of poor revenue collection especially in fragile states where, because of state weakness, governments are too weak to effectively tax 'big players' in particular multi-national corporations (including powerful natural resource companies) thereby creating the perception of inequitable treatment between low- and high-income earners, which then leads to taxpayers resenting paying taxes. This is well illustrated by the case of Bolivia mentioned earlier.

Table 2.2: Selected regression studies on determinants of tax revenue performance

Author(s)	Dependent variable, sample and time period	Estimation method	Independent (right-hand side) variables in regression				
			Macro-economic	Tax structure	Economic structure	Governance	Other
Williamson (1961)	T/Y(33 LDCs 1950-59)	OLS	Per capita GNP*				
Lotz and Morss (1967)	T/Y (72 developing countries, 1962-66)		GNP/capita*, trade share*				
Lotz and Morss (1970)	T/Y(50 developing countries, 1962-66)	OLS	Per capita GDP(private)*, trade*			'Government centralisation' (i.e. autocracy)	
Chelliah (1971)			Non-mining exports*		Shares of mining exports*and agriculture* in GNP		
Chelliah *et al*. (1975)	T/Y (all LDCs 1972-76)	OLS	GDP, Openness (exports/GDP*)		Mining exports/GDP*		
Tait, Grätz, Eichengreen (1979)	T/Y (all LDCs 1972-76)	OLS	GDP(net of exports), Openness exports/GDP)		Shares of agriculture and mining* in GDP		
Greenaway (1980, 1984)	T/Y (50 countries) 1972-77	OLS	GNP	International trade*			
Tanzi (1981)	T/Y (34 sub-Saharan African countries, 1977)		GNP/capita, Non-mining exports*		Shares of mining*		Foreign debt*
Tanzi (1992)	T/Y (88 developing countries, 1978-88)		GNP/capita		Shares of agriculture*, import share*,		
Leuthold (1991)	T/Y (eight African countries 1973-81)	OLS, also Autoregressive	Desired tax share, , openness* ([X+M]/Y)		Shares of mining and agriculture* in income		
Stotsky and WoldeMariam (1997)	T/Y (43 sub-Saharan countries, 1990-95)	OLS	GDP/capita*,	export*, imports	Shares of agriculture*, mining*, manufacturing		
Ghura (1998)	T/Y (39 sub-Saharan countries, 1985-96)	IV-GLS	GDP/capita*, inflation*, exchange rate,	Trade*, natural resources*	Share of agriculture*	provision of public services*, corruption*	Structural reforms*
Piancastelli (2001)	T/Y (75 countries, 1985-95)		GDP/capita	Trade share*,	Shares of agriculture*, manufacturing*, services*		
Baunsgaard and Keen (2005)	T/Y (111 developed and developing	Panel data (fixed and random effects);	Per capita GDP, openness*		Agriculture/GDP; share of trade taxes and VAT in total revenue		Overseas aid*

	countries, 1975-2000)	instrumental variables; GMM					
Gupta (2007)	T/Y (1980-2004)	Panel data with fixed- and random-effects specifications, also difference-GMM and system-GMM	GDP/capita* (significant in low income countries only) Openness (goods and services/GDP)		Agriculture/ GDP*	Corruption*, political stability, rule of law	Aid/GDP*
Bornhorst *et al*. (2008)	Non-hydrocarbon T/Y (30 hydrocarbon producing countries, 1992-05)	OLS, Allerano Bond estimator	GDP/capita	Trade*	Share of agriculture*	Corruption*	
Bird *et al*. (2008)	T/Y, Revenue/Y (25 developing countries, 1990-99)	Cross-section OLS and 2SLS	GDP/capita*	Share of trade*	Share of agriculture*	Voice & accountability*, corruption*	Population growth*
Tanzi and Davoodi (2008)	T/Y (68 countries, 1980-95)	OLS	GDP/capita*			Corruption index*	
Drummond *et al*. (2012)	Total revenue/GDP (including social contributions and non-tax revenue) (1980-2009)	Panel data with fixed- and random-effects specifications	GDP/capita* Agriculture/GDP Inflation rate*		Share of trade taxes	Corruption, oil/natural resource rents*, size of shadow economy	Aid/GDP
Ehrhart (2012)	T/Y (66 developing countries, 1990-2005)	Random effects, instrumental variable 2SLS	GDP/capita, inflation,	Imports	Share of agriculture,	Corruption*, bureaucratic quality*, political regime*	Urbanisation, population*, aid/capita
Le *et al*. (2012)	T/Y (110 developed and developing countries, 1994-09)	OLS with regional and time dummies	GDP/capita*	Share of trade*, agriculture*		Bureaucratic quality*, corruption index*	Population growth*
Fenocchietto and Pessino (2013)	T/Y (113 countries, 1991-12)	Stochastic frontier method	Inflation, agriculture/GDP*,	Share of trade*	Share of agriculture*	Corruption*	Gini coefficient of inequality*
Keen and Lockwood (2010)	T/Y (143 countries, 1975-00)	OLS, instrumental variable	GDP/capita*,	Share of trade*, VAT* (but not for SSA)	Share of agriculture*		Population
von Haldenwang *et al*. (2014)	T/Y (municipalities in Peru, 1998-2011)	Fixed effects	GDP/capita			Population growth*, election year*	ARA*
Ahlerup *et al*. (2015)	T/Y (sub-Saharan Africa, 1980-2010)	Fixed effects, 2SLS	GDP/capita, trade*,	VAT	agriculture share*		ARA, population,

							IMF programme
Langford and Ohlenburg(2016)	T/Y (excluding natural resource revenue and social security contributions)	Stochastic frontier method	GDP/capita, inflation* openness (imports/GDP)		Industrial structure (manufacturing/output)	Corruption*, law and order*, democratic accountability	Educational level (secondary enrolment rate?), educational level
Dom (2019)	T/Y (49 sub-Saharan African countries, 1980-15)	Fixed effects, 2SLS, GMM, Common Correlated Effects Mean Group estimator					ARA, aid, IMF programme, lagged tax revenue

Notes: *denotes significance of this variable at the 5% level or higher

In this chapter, we pick up on three issues from the literature which are pertinent to developing countries: *poor quality of tax structures* recognised to play a major role in the growth of tax revenues and the adoption of the *VAT* as a possible solution; ring-fencing of the process of revenue collection from political interference *(depoliticization)* and establishment of *ARAs*; and the construction of '*fiscal contracts*' to mitigating against the political anger and turmoil caused by increases in taxes, especially in politically fragile states. We seek to understand the 'true' the revenue effects of these policy initiatives, which have been adopted ostensibly under the stress of pressure from the IMF and aid donors. Although these policy initiatives included other objectives[6] improving revenue collection was certainly one of the crucial elements.

2.3.1 Quality of tax structures and value-added tax

Several studies have linked the quality of tax structures to a country's ability to build an effective tax system and generate more revenues. Gordon and Li (2005) and Tanzi and Vito (2001) have documented some of the relevant aspects of tax structures found in developing countries, which they describe as 'puzzling' and associate them with low capacity to generate government revenues. They argue that historically, fiscal systems in developing countries have depended heavily on distortionary and unstable sources of tax revenues such as sales, export and turnover taxes, which is a cause of poor performance. This is contrary to the quality of tax structures found in other countries which rely more on income, consumption and capital, and abstain from distortionary taxes on exports and imports (Cagé and Gardenne, 2018; Greenaway, 1984, 1991; Greenaway and Sapsford, 1987; Greenaway and Milner 1991; Tanzi, 1992; Mosley, 2015. This issue has dominated development policy debate and to try and improve the quality of tax structure, and consequently revenue collections, the international development agencies have sought to wean governments in poor countries away from dependence on these poor sources of revenue, and towards taxes on other bases, and in particular the VAT. The adoption of VAT has been a key element of the IMF's conditionality for financial aid to poor countries and has now been widely adopted in emerging and low-income countries making it an integral part of tax structures in these countries.

[6] For instance, the formation autonomous revenue authorities has been linked to other reforms objectives; to facilitate other reforms in tax administration and to support the fight against corruption (Fjeldstad and Moore, 2009)

The VAT was first implemented in France in 1954, and shortly after in Côte d'Ivoire, Senegal and Brazil in the 1960s. As can be observed from Table 2.3, which shows the spread of value-added globally, its adoption was initially limited to a few countries: less than 10 countries in the 1970s. By the late 1980s, it had spread to almost 50 countries, predominantly in Europe, as a pre-requisite for European Union membership, and in a handful of countries in Latin American and Africa. Over the past few decades, it has spread very widely with nearly three-quarters of the adoptions having taken place between 1990s and the late 2000s (Baunsgaard and Keen, 2005: p.3). It has now been adopted in more 140 countries. By some accounts, the widespread adoption of the VAT has been regarded as "the most significant development in the evolution of tax structures and economic reforms of the twentieth century" (Cnossen, 1998; Keen and Simone, 2004: p.37) and the most significant innovation in tax policy design of the past hundred years (Ebrill *et al*., 2001; Keen and Lockwood, 2010). In sub-Saharan Africa, East Asia and the Pacific most countries VAT was not widespread until the mid-1990s, and accelerated rapidly into the 2000s, but the rate of adoption has tapered since. Its adoption in the middle east and north Africa has only been modest.

Table 2.3: The Adoption of value-added tax globally (1960 – 2013)

Year	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	East Asia and Pacific	Sub-Saharan Africa
1960	0	0	0	0	1
1965	0	1	0	0	1
1970	8	3	0	0	1
1975	14	10	0	0	1
1980	14	13	2	1	2
1985	15	16	2	2	2
1990	20	17	4	6	5
1995	44	21	6	11	15
2000	48	24	7	18	26
2005	51	24	9	19	35
2010	52	30	11	20	38
Total	(53)	(33)	(21)	(32)	(48)

Source: IMF, Ebrill *et al* (2001), Ahlerup *et al.* (2015) and compilation by author from various sources. Note: The figures in the parenthesis indicate the total number of countries per region as per the World Bank classification.

As stated above, the adoption of the VAT has been a critical component of the IMF-supported structural adjustment programmes in developing countries (World Bank, 1991; IMF, 1998). Zambia's and Ethiopia's Letters of Intent of 1994 and 2003, respectively provide some of the evidence where governments had to agree to the IMF recommendation to introduce a VAT"

by April 1995 in the case of Zambia[7] and January 2003 in the case of Ethiopian[8]. Table 2.4 shows the standard VAT rates and dates of adoption between 1980 and 2013 in African countries in our sample. The average standard tax rate is 16 percent, and ranges between 5 percent in Nigeria and 20 percent in a number of countries including Cote d'Ivoire, Madagascar and Tanzania.

Table 2.4 Standard value-added tax regimes in SSA (1980-2013)

	Country	Value added tax	Year of operation*
1	Angola	no VAT	
2	Burundi	18%	2009
3	Benin	18%	1991
4	Burkina Faso	18%	1992
5	Botswana	10%	2000
6	Central African Republic	18%	2001
7	Cote d'Ivoire	20%	1960
8	Cameroon	19.25%	1999
9	Congo, Dem. Rep.	16%	2012
10	Congo, Rep.	18.9%	1997
11	Comoros	no VAT	
12	Cabo Verde	15%	2004
13	Ethiopia	15%	2003
14	Gabon	18%	1995
15	Ghana	12.5%	1999
16	Guinea	18%	1996
17	Gambia	15%	2013
18	Guinea-Bissau	15%	2001
19	Kenya	16%	1990
20	Lesotho	14%	2003
21	Madagascar	20%	1994
22	Mali	18%	1991
23	Mozambique	17%	1999
24	Mauritania	14%	1995
25	Mauritius	15%	1995
26	Malawi	16.5%	2005
27	Namibia	15%	2000
28	Niger	17%	1986
29	Nigeria	5%	1994
30	Rwanda	18%	2013
31	Sudan	10%	2000
32	Senegal	18%	1961
33	Sierra Leone	no VAT	
34	Eswatini	14%	2001
35	Seychelles	15%	2013

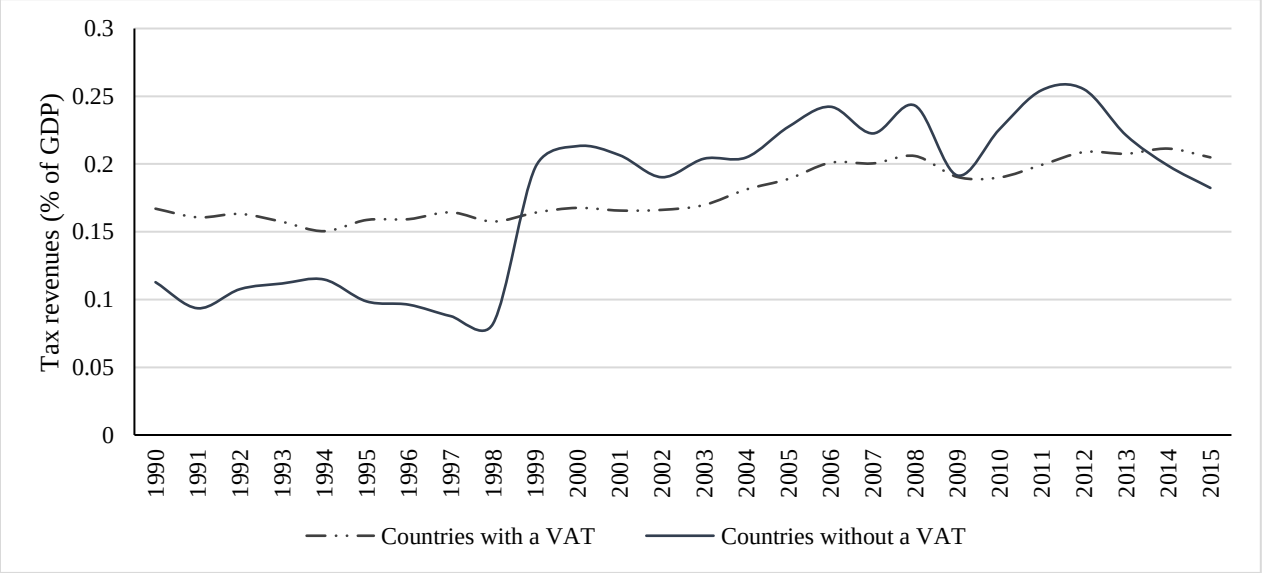
[7] International Monetary Fund, Zambia, Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding, April 1994.
[8] International Monetary Fund, Ethiopia, Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding, January 2001.

36	Chad	18%	2000
37	Togo	18%	1995
38	Tanzania	20%	1998
39	Uganda	17%	1996
40	South Africa	14%	1991
41	Zambia	17.5%	1995
42	Zimbabwe	15%	2003

Source: Ebrill *et al.* (2002), Crowe (2016).
Notes: * refers to the year when the VAT was actually implemented

The question of whether these tax policy reform initiatives, which have led to changes in tax structures and the widespread implementation of the VAT in emerging and developing countries, have successful towards providing revenue advantages as suggested by its advocates, has recently become a subject of intense debate. International development agencies and local politicians expect these reforms to result in more tax revenues, but as can be noted from Figure 2.2, which shows tax revenue performance in both sets of countries that adopted and those that did not adopt the VAT, tax revenues in both groups of countries have been rising since the 1990s. Revenues in countries with VAT initially rose faster but have remained close to those countries without the value-added. Another important observation is that tax revenues in countries that adopted the VAT have fluctuated more, although this is not the focus of the study. It is certainly difficult to make any generalisations about the revenue advantages of having a VAT from these stylised facts.

Figure 2.2 Tax revenues in countries with or without a value-added tax in Africa (1990-15)



Source: Ahlerup *et al*. (2015), Ebrill *et al*. (2001). Notes: The evolution of the averaged total revenue-to-GDP ratio for countries which adopted a VAT (full line) and those which did not (dotted line) in selected countries in Africa.

What is quite certain from the literature is that many poor countries, especially in Africa, turned towards the VAT in the mid to the late 1990s because of the stubborn and persistent low levels of revenue collections (Mann, 2004). Although a majority of countries in Africa have had considerable experience of implementing a VAT, averaging about 16 years by 2013, it remains unclear whether this reform has been successful towards the revenue objective it was set out to meet. Surprisingly, there are very few studies that have analysed the possible effects on tax revenue performance of the adoption of a VAT, and amongst these few the evidence is limited or inconclusive. This limited literature has produced mixed results and disagreements about the impact of this tax. Among the influential studies that have conducted cross-country analysis to assess the effect of the VAT, Ebrill *et al*. (2001)'s study of 'The Modern VAT, Chapters 3 and 4" provides cross-section data on eight sub-Saharan African countries that had implemented VAT in the 1990s to show evidence that the implementation of the VAT has been beneficial, and that the effect is even larger in more developed countries and less in more open ones. These findings have been criticised for potentially being biased due to the possibility of the adoption of VAT being endogenous. A study which assessed whether revenue losses from reduction in tariffs on international trade have been compensated by the revenues brought in as a result of the VAT argues that "[F]or high-income countries the answer is clearly in the affirmative, for middle-income countries, there is support for significant recovery but for low-income countries, however, recovery has been far from complete" Baunsgaard and Keen (2005: p.22). This result was confirmed in a later study which finds no evidence that low-income countries with a VAT have recovered more than those without (Baunsgaard and Keen, 2010: p.571- 575). Keen and Lockwood (2010: p.148) using a sample of 143 countries between 1975-2000 find some evidence that the "VAT may have increased long-run tax revenues by about 4.5 percent of GDP in most countries, but the evidence is less apparent in sub-Saharan Africa". The most recent and comprehensive study, to our knowledge, conducted on a sample of 47 sub-Saharan African countries over the period 1980-2010 shows that on average VAT has a "negligible effect or its impact is non-existent" (Ahlerup *et al*., 2015: p.702).

One possibility for the mixed findings on the 'true' revenue impact of VAT can be country heterogeneity. That is, the impact of the VAT may vary across different countries due to certain country-specific characteristics. Previous studies have shown that the effect of VAT depends on

the income level (Ebrill *et al.*, 2001; Keen and Lockwood, 2010): higher income countries are better prepared to handle the complex informational, administrative and system requirements of the VAT. Although several studies have highlighted the important role played by institutions of governance in determining policy outcomes, this issue has rarely ben tackled in the context of the VAT. For example, Gupta *et al*. (1999), World Bank (2007), Rajkumar and Swaroop (2008) and others have argued that policy reform implemented for various purposes may not lead to desirable outcomes in less favourable institutional environments. A survey of the large empirical literature on how institutional quality can affect development outcomes is provided in Kaufmann *et al*. (1999). Acknowledging the major part that institutions of governance can play in determining policy outcomes, and the lack of consensus on the effectiveness of the VAT towards its revenue objectives, this chapter tries to explore whether the revenue impact of the VAT depends on the institutional environment within the tax is designed and implemented. We follow ab approach similar to the one employed in Burnside and Dollar (2000) who examine whether the effects of aid on growth depend on the quality of domestic policies, and Rajkumar and Swaroop (2008) who analyse whether the effectiveness of public spending depends on governance quality.

The main institutions of interest here are those that are central in the ability to formulate and implement sound policies and, in the case of tax policy, those which can affect tax compliance behaviour. It is recognised in the literature that where institutions are strong there is a low risk of political interference or policy reversals, which can increase the efficiency and effectiveness of the tax system. (Bird and Gendron, 2007; James, 2015). The quality of institutions can affect the revenue impact of the VAT through efficiency in tax collection and the ability to enforce tax laws. The quality of institutions is also likely to influence voluntary tax compliance. Previous studies have also indicated that taxpayers are less willing to cooperate in tax matters if there are perceptions of widespread corruption which can harm compliance rates and increase evasion; tax exemptions perceived to be linked to bribery can undermine public trust in the government and compliance with tax obligations; widespread corruption can also drive businesses into the informal sector, and thus, eroding the potential tax base. From our previous discussions, it is likely that bureaucratic quality (effectiveness) and the ability to control corruption and enforce the rule of law will be possible factors which can affect the effectiveness of the VAT in meeting its revenue objective. We, therefore, argue that the VAT will be more effective in countries with better quality

of institutions. We, therefore, attempt to contribute to the literature by bringing into the analysis the potential impacts of time lags and experience and heterogeneity in institutional environments. Finally, we also explore some of these issues in more detail using case study analysis.

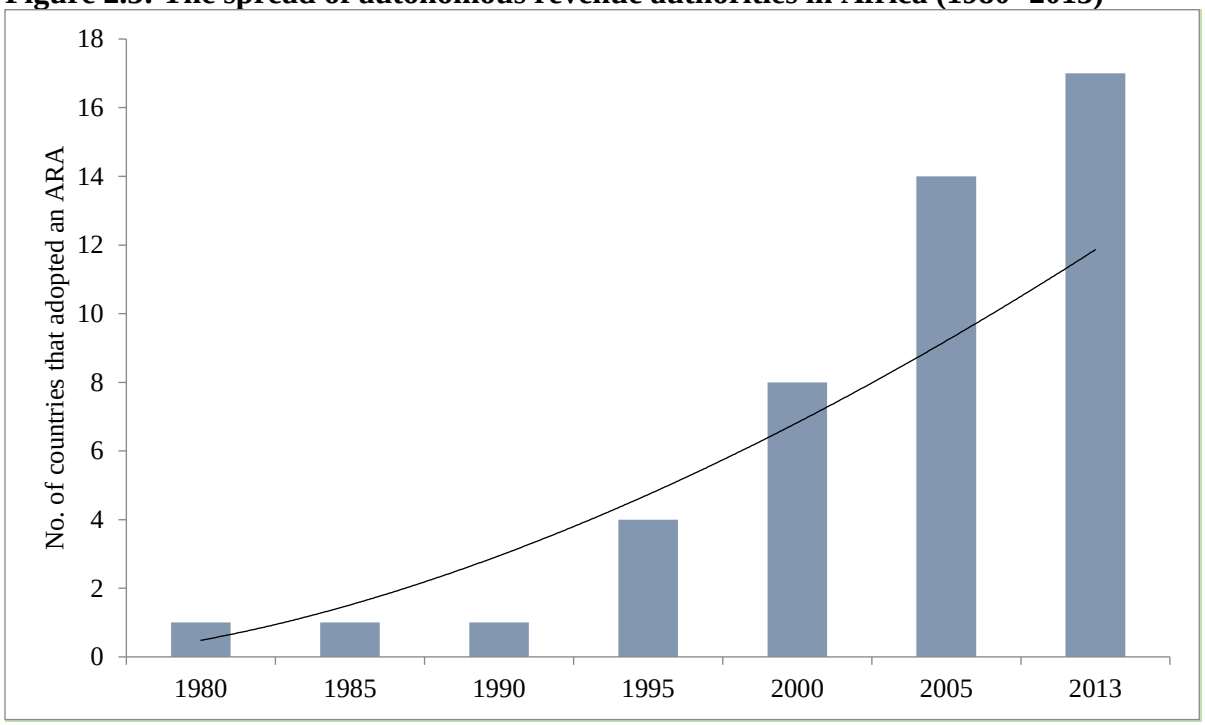
2.3.2 Autonomous revenue authorities

As mentioned earlier, the development community and independent analysts have identified political factors as the roots of poor tax performance in developing countries, and global efforts to overcome them have focussed on, *inter alia*, ring-fencing the process of revenue collection from political interference by moving the process of revenue collection from the direct control of the ministry of finance to a more professional and autonomous revenue authority. Aid donors expect that such a reform can contribute towards curbing the discretionary use of taxation powers, improving public trust in institutions and entrench tax compliance (Chand and Moene, 1999; Bergman 2003; Fjeldstad and Moore, 2009). Revenue collection responsibilities are traditionally "integrated in the ministry of finance" in many countries (Ahlerup *et al*., 2015: p.692), but especially in poor countries such public sector institutions seldom get trust from citizens because they are perceived to be politicised, less professional and as conduits for political corruption and patronage. Chand and Moene (1997) claim that corruption in revenue collection has been a key factor behind the low rates of tax compliance in poor countries. Some commentators also argue that although lack of confidence in public sector institutions is a global issue, it is exceptionally widespread in the poorest countries of the world, and exacerbated by weak and poorly functionally institutions of governance, political corruption and patronage (Fjeldstad and Ranker, 2003; Moore, 2004; 2013). Studies have documented that taxpayers are less likely to cooperate on tax matters (including on payment of taxes) where they perceive public institutions to engage in discretionary use of taxation powers, abuse of public authority and selective enforcement of laws and procedures (Scholz, 1998: p.138-400; Levi, 1998; Slemond, 2003; Manasan, 2004: p.174).

The formation of ARAs is considered an institutional innovation that is part of international effort to strengthen tax administration, promote fairness in tax administration, curb corruption and patronage (including between government and powerful rent-seekers). It is envisaged that under an independent and professional organisation (with professional, well-trained and remunerated

staff, well-equipped offices, managerial space, financial autonomy and administrative efficiency) tax affairs will be ring-fenced from political interference (Devas, Delay and Hubbard, 2001; Taliercio, 2004; Kidd and Crandall, 2006; Mo, 2019). The operationalisation of ARAs is typically done by enactment of laws which act as a signal of a "credible commitment to a fairer and less discretionary" revenue collection process to win taxpayers' trust in public institutions (Dom, 2019: p.1418). The creation of ARAs has been a key element of fiscal reforms, especially in sub-Saharan Africa, during the last three decades (Bergman 2003; Chand and Moene 2009; Fjeldstad and Moore 2009). Outside of sub-Saharan Africa, there have been few ARAs created elsewhere, in particular Latin America and Asia. Figure 2.3 shows the spread of ARAs in Africa between 1980 and 2013, and indicates that prior to the 1990s governments of poor countries were less willing to undertake radical reforms that involved the creation of ARAs, but as fiscal crises worsened (including public indebtedness and massive fiscal deficits) during the 1990s, more and more countries introduced ARAs. Between 1990 and 2013, the number of countries with ARAs increased from just one to more than 17.

Figure 2.3: The spread of autonomous revenue authorities in Africa (1980 -2013)



Source: Bräutigam *et al*. (2008), Fjeldstad and Moore, (2009), Fjeldstad (2013), Ahlerup *et al*. (2015), Dom (2019). An autonomous revenue authority is considered to have been established for purposes of assessing its impact on tax ratios when it became operational, and not the legal establishment which is commonly followed in the literature.

If ARAs in developing countries were created mostly for fiscal and economic purposes, as suggested by some commentators (Barbone *et al*., 1999; Mann, 2004; Fjeldstad and Heggstad, 2012; Baskaran, 2013), it is reasonable to suppose that countries which have established them should experience growth in tax revenue performance relative to those that have not. Taliercio (2003) finds evidence in Latin America suggesting that politicians are more willing to make a "credible commitment" to depoliticising the process of revenue collection to make it more competent, efficient and fair, when the payoff is increased tax compliance and higher revenues. Both international development agencies and local politicians expect this tax innovation to result in more tax revenues (IMF, 2011; Di John, 2009; OECD, 2011; von Haldenwang *et al*., 2010), but this is less clear in the literature. The number of empirical studies on the impact of ARAs is surprisingly limited, with many of the studies taking the case study and qualitative approaches, focussing on managerial effectiveness, operational autonomy, corruption and human resource effectiveness, among others. For instance, Kidd and Crandall (2006) analyse efficiency of ARAs in 14 developing countries using data collected using questionnaires to assess the ARAs but not fiscal effects are investigated. Some studies try to show a link between the growth of tax revenues and levels of independence of ARAs (Taliercio, 2004a). Hlope and Friedman (2002) and Smith (2003) report anecdotal evidence of a success story in revenue collections after the establishment of the South African Revenue Service (SARS) in South Africa, which surpassed revenue targets and significantly increased the tax take during the first decade of the fall of apartheid. Chand and Moene (1999) assert that the improvements in revenue levels observed in Ghana from 4.5 percent in the 1980s to over 8.5 percent of GDP in 1990s were largely credited to the improvements brought about by reforming tax administration. Fjeldstad and Moore (2009) provide an extensive qualitative view on the spread and different models of ARAs in developing countries, but go on to paint a pessimistic picture that "although they were created for purposes of increasing central government revenues, to date there is little sign that ARAs have actually contributed to that goal" (p.14). The most recent study of ARAs by Dom (2019: p.1423) also comes to the pessimistic conclusion that 'the findings from the different models fail to provide support for the hypothesis that ARAs have increased total tax revenues in SSA on average.' He notes that ARAs may be limited by their lack of a meaningful role in tax policy and the proliferation of tax exemptions.

Von Haldenwang *et al*. (2014) is one of the first studies to use a quantitative approach in analysing the revenue effect of ARAs in municipalities in Peru. Their findings indicate that municipalities with ARAs performed better than those without. A very recent case (Ahlerup *et al*., 2015) which is close to our study examines the revenue effect of ARAs in Africa during the period 1980-2010, and find some evidence suggesting that this tax innovation only has revenue impact in its first years, but this effect dissipates over time (p.703). The most recent quantitative study which has appeared since the start of this work, Dom (2019), in spite of taking account of revenue trends prior to creation of autonomous revenue authorised, which was largely ignored in previous studies, finds no robust evidence that this particular tax innovation has provided revenue advantages in countries where it has been implemented.

What is quite clear from these studies is that the proposition that the creation of ARAs can lead to better tax revenue performance compared to the case where the responsibilities of revenue collection remain under the direct control of a traditional government department has neither been established nor refuted because the existing evidence is inconclusive. Existing studies have faced some difficulty in establishing the true revenue impact of creating ARAs due to the possibility that certain country-specific factors, which play an essential role in realising the objectives of tax administration reforms, are not adequately accounted for. Although there is much homogeneity in the objectives for the creation of ARAs (as a possible solution to political obstacles to higher revenue performance and high levels of corruption in tax administration (Taliercio, 2004)), and their organisational and corporate structures (management boards style), there are also important issues of heterogeneity in many other respects. For instance, the IMF observes that widespread political corruption and patronage "remain a fundamental barrier to effective and fair taxation, and to building wider trust between government and taxpayers" (IMF, 2011: p.19), and therefore substantially dampens voluntary tax compliance (Tanzi and Pellechio, 1995; Silvani and Baer, 1997). Corruption also tends to foster the development of the informal economy by causing businesses to hide from the burden of corruption (Friedman *et al*, 1999: Schneider and Enste, 2000), and tax exemptions perceived to be the result of corruption undermine public trust in government and erode the culture of voluntary compliance. Also, poorly designed and complicated tax policies tend to overload tax systems with numerous low-yielding taxes or too high marginal tax rates, which are administratively burdensome as they often divert efforts and resources from

major tax sources and overstretch tax administration (Schneider and Enste, 2000; Schneider, 2005; Di John and Putzel, 2005; Kidd and Crandall, 2006). Finally, policy consistency and stability in the tax system can enhance the credibility of the system and reduce the cost of compliance and enforcement, as opposed to frequent and fundamental tax system changes can be a reason for difficulties in tax administration (Jenkins, 1994; Delay, Devas, and Hubbard, 1999; Mann, 2004; Taliercio, 2004).

Although these important governance issues, which are characteristic of developing country settings, have been recognised to be essential in the performance of revenue authorities, existing studies have not adequately incorporated them into the analysis of the revenue impact of revenue authorities. In this chapter, we revisit this issue and attempt to contribute to our understanding of the relationship between ARAs and revenue performance by bringing into the analysis institutions of governance within which ARAs operate. We explore whether the quality of institutions of governance can limit or enhance the efficiency of revenue authorities. In particular, we test the proposition that the creation of the autonomous revenue authority is likely to be more successful in meeting the revenue objective in countries where the government is effective in formulating and implementing sound policies, and committing to such policies (policy stability); has the ability to control corruption; and where taxpayers have confidence in and abide by the rule of law.

Another issue we wish to factor into the analysis is that institutional reforms tend to be complex and thus take some time before the real benefits of the transformation can materialise (Acemoglu *et al*. 2005). Our experience working in Zambia and also observed in neighbouring countries is that it takes a few years to have a fully functional organisational structure, recruit and train the relevant staff, procure and set up computer and administrative systems. There are also several refinements to the organisational structure during the transition period. It is, reasonable to anticipate the creation of ARAs to bring about revenue benefits with a time lag. Although this approach may be considered as only suggestive, it provides a richer characterisation which we hope can help in shading some light on the less optimistic and surprising finding on the lack of autonomous revenue authority impact. We gain more insights into how cross-country heterogeneity and revenue authorities have affected tax revenue performance by complementing

the econometric analysis with two case studies of Ghana and Zambia, whose contrasted fiscal performance is highlighted in Table 2.1 above.

2.3.3 'Fiscal contracts' approach

Finally, we consider the ideas of the '*fiscal contract'* approach as a possible solution to poor revenue collection. It is frequently documented that the roots of poor revenue performance are political (Ricciuti *et al*., 2016: p. 29; Besley and Persson, 2014: p. 100). Governments especially of weak states are frightened to raise taxes if they fear that the consequences of doing so will be immediate loss of office or worse, influential (corporate and individual) taxpayers in such societies will seek to use any leverage they can muster to avoid paying tax, and all taxpayers will resent paying tax more particularly if they can see that others much richer than them are not doing so. An example of how governments of weak states fail to raise taxes, even at a time of fiscal crisis, due to fear of loss of power and other political factors is well illustrated in Mosley (2012) and also restated in Lenton *et al*. (2017). Efforts to mitigate the anger and political turmoil caused by tax increases have therefore been made by many governments. One such aspect proposed in the theoretical literature is framing the process of revenue collection as part of a '*fiscal contract*' in which government commits itself to provide improved public services in exchange for the revenue provided by taxpayers, rather than as a coercive process in which the state extorts taxes where it can without needing to justify or be held to account for the way in which this is done (Moore 1998, 2013; Bräutigam *et al*. 2008). Our primary objective is to analyse the process by which such 'fiscal contracts' between taxpayers and governments can emerge and impact on the growth of tax revenue.

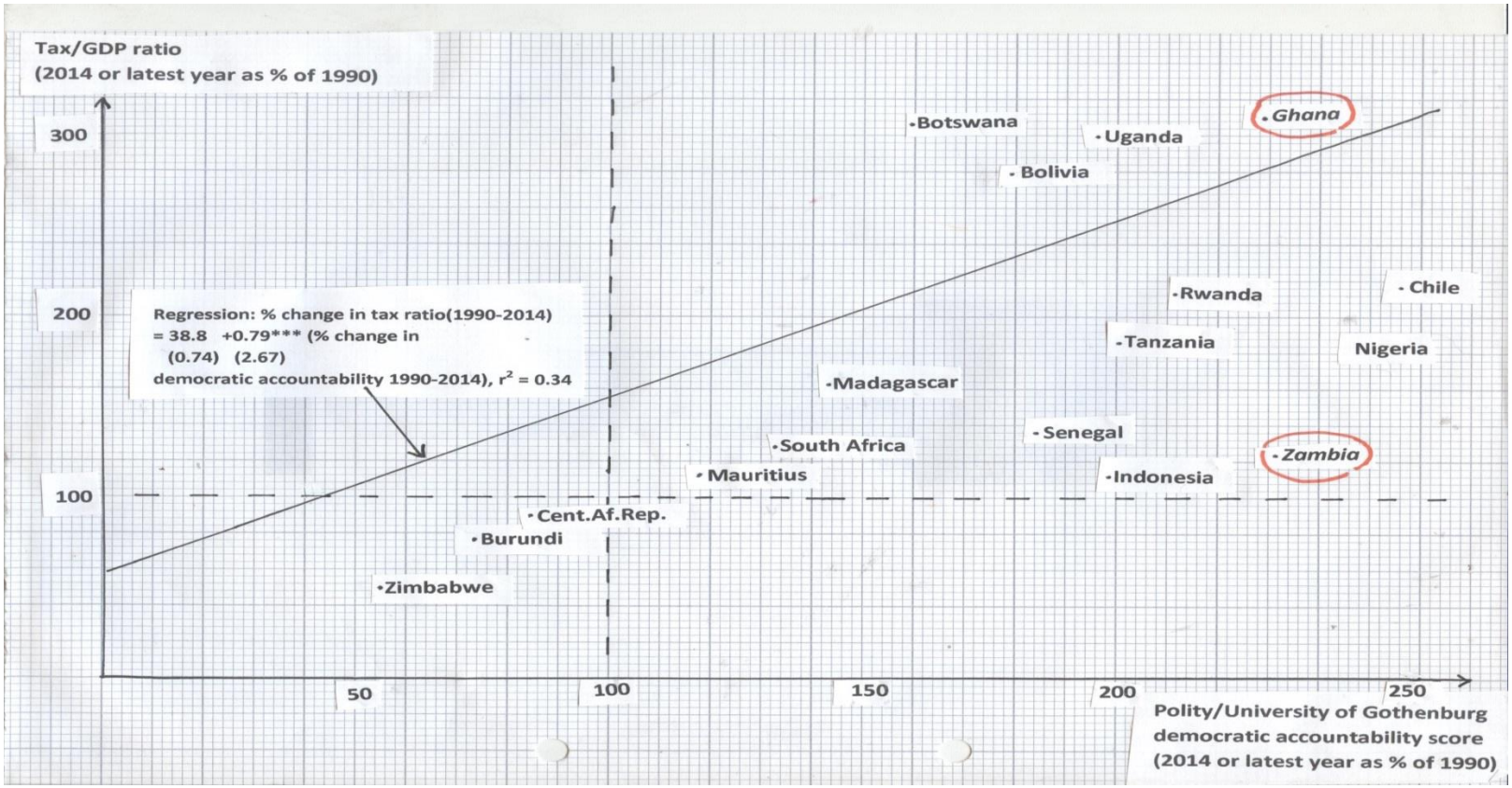
The concept of a social contract begins in the seventeenth century with Thomas Hobbes, but the idea that effective social contracts must be democratic originated with the Enlightenment philosopher Jean-Jacques Rousseau (1762, 1986), who argued that only the people, and not autocratic authorities, should be allowed to legislate: "mighty does not make right, and…we are obliged to obey none but legitimate powers" (Rousseau 1986: p.7). Dictatorship, therefore, was in his view no way of achieving a social contract; however, the delegation of decision-making powers to citizens, in Rousseau's view, would only take make possible the expression of private interests,

and not of the social optimum, or "general will‟ as Rousseau called it, which "looks only to the common interest, whereas (the will of all) looks to private interest, and is simply a sum of particular wills" (Rousseau 1986: p.29). For Rousseau, what was required to achieve the social optimum was, in the first instance, a very strict form of democracy, not typical of any modern state, in which all legislative decisions were decided by the majority view of all adult citizens, as in Rousseau's native city-state of Geneva (Rousseau 1986: p.71-73, Rosenblatt 1997), modified by the actions of an enlightened executive, or president, who would act in the interests of the general will, but, was supposed to refrain entirely from the use of coercive power‟ (Rousseau 1986, editor's introduction by Frederick Watkins, page xxxvii)4[9] . Rousseau's view was put forward as a riposte to the view put forward by Thomas Hobbes, who had argued a century earlier that the preservation of social order required the imposition of a social contract enforced through the autocratic power of a sovereign (Hobbes 1651, Cervellati *et al* 2008), but it will be clear from the above that his approach finesses the problem of how to create representative political institutions, not to mention accountable bureaucracies and effective judicial institutions, and cannot be exactly represented by democratic accountability in the sense of one adult, one vote.

One element in the achievement of social order and development, as discussed earlier, in which the conflict between general will/social optimum and private optimum emerges particularly sharply, is of course the provision of public goods financed by taxation. Taxation, of course, can only be imposed by legislative authority, and it therefore seems to follow axiomatically that ability to impose taxes varies with the degree of democratic accountability, but subject to the caveat made above concerning the distinction between the will of all individuals and the social optimum; because private individuals, considered purely as taxpayers, dislike paying tax, and can only be expected to be willing to do so if either they see themselves getting something in return (such as benefits from public expenditure) or an "enlightened executive, or president‟ persuades them that it is worth entering into a social contract which provides such benefits in return for tax payments.

[9] This distinction between the general will and the will of all can be interpreted as awareness of public-goods problems – in other words, the existence of particular services, including political stability and environmental protection, which are in the public interest even though they are not perceived by citizens to be in their private

Figure 2.4: Sample of less developed countries: scatterplot, tax/GDP ratio in relation to democratic accountability (case-study countries circled; not all data points shown)



Source: democratic accountability data from University of Gothenburg Quality of Government database (www. qog. pol. su.se); tax/GDP ratio from World Bank, *World Development Indicators* database. This diagram is reproduced from Lenton, Masiye and Mosley (2017).

An initial piece of evidence in supporting the idea that democratic governance may be good for the formation of social contracts is provided by two-variable regressions such as that depicted in Figure 2.4, for a sample of developing countries between 1990-2010, which suggest a significantly positive relationship between increases in democratic accountability and the tax-to-GDP ratio.

In addition, the recent literature on the emergence and effectiveness of '*fiscal contracts*' suggests that , although there is clearly two-way causation at work, the sequence of causation may be evolving: according to Fjeldstad and Therkildsen, historically 'taxation contributed to political development and democratisation by catalysing "revenue bargaining", i.e. a process in which the state exchanged influence over public policy with tax revenues from citizens' but more recently in LDCs, and specifically in Tanzania and Uganda, 'democratisation drives tax reform – not the other way round' (Fjeldstad and Therkildsen, in Bräutigam *et al* (eds) 2008: pp.128-129).

Our second proposition is that the likelihood of forming a satisfactory and stable '*fiscal contract*' between taxpayers and government depends on the establishment of mutual trust, or social capital, between those parties – an expectation by the government that taxes will be paid, in return for an expectation by taxpayers that the government will be trustworthy, i.e. that they in return will receive public services that will benefit them. In other words, to understand the amount of tax which is paid (the tax ratio), we have to consider factors influencing not just the size and incidence of the tax bill, but the amount and quality of public services which are provided in return, as essential elements in the '*fiscal contract*'. Jeffrey Timmons goes further than this, insisting that "The contemporary practice of studying spending and taxation in isolation from one another is fundamentally flawed because half of the equation (either taxes or spending) is left out of the analysis" (Timmons, 2005: p.531). Developing this idea, Timmons explains the growth of trust between governments and taxpayers in terms of a game between these two groups, and we build on his approach here. His model, which we present in adapted form as Table 2.5, is a 2x2 matrix, with both parties having two options: the truster, or taxpayer, may either comply or not with demands to pay tax presented by the government, and the trustee, or government, may either offer public services in exchange for the tax revenue provided, or simply extort this revenue from the taxpayer, using threats or sanctions if necessary, without offering anything in return.

Table 2.5. The generic 'fiscal dilemma'

		Options for government ('trustee')	
		Implement delivery of services and *'trade'* this for payments of taxes	*Coerce* the taxpayer without offering any benefits in return
Options for taxpayer ('truster')	Pay tax (*'Comply'*)	*Quadrant I* ($\alpha G^*-\beta T$, $T-G_c$)	*Quadrant II* ($-\beta T$, T)
	Not pay tax (*'Not comply'*)	*Quadrant III* (G^*,$-G_c$)	*Quadrant IV* ($p(-T-S)$, $p(T+S)-S_c$)

Note: *Entries in cells are presented in the order (taxpayer, government)*

[G*= government expenditure, α = 'quality of government expenditure', T= tax revenue, β = disutility attached to tax payments, S = penalty paid by non-taxpayers who are 'caught', p = probability of being caught] This figure is inspired by the model of Timmons (2005) and is reproduced from Lenton, Masiye and Mosley (2017).

In Table 2.5, we imagine that the state is bargaining with the taxpaying population for revenue. T is the total amount of public revenue (including revenue from nontax sources such as user charges), and β is the utility(characteristically negative) attached by taxpayers to paying them; G* is the amount of government expenditure (and α is taxpayers‟ estimated valuation of those benefits); Gc is the cost of producing the goods and services financed by public expenditure; p is the probability that the state is able to identify and bill those who are liable to pay tax; S is the amount of the penalty imposed on defaulting taxpayers; and Sc is the cost of imposing that penalty. As Timmons (2005:537) notes, if the payoffs satisfy the conditions $\alpha G^*-T>p(-T-S)>-T$ for taxpayers and $T-Gc>p(T+S)-Sc>Gc$ for the state, the game is a prisoner's dilemma. Of course, in the conventional (one-shot) prisoner's dilemma, the equilibrium solution is in the bottom right-hand corner (quadrant IV) – in other words, no agreement or contract is reached and as a consequence, both parties are worse off than they would have been in the situation where they would have been able to communicate and bargain. In Table 2.6a, where we set the values of the parameters at the level G*=4, T=2,Gc= α= 1, β= -1, S = -2,Sc = 0,p=0.5, the outcome of the taxpayer's dilemma is of this sort: the taxpayer's dominant strategy is always to play Not Comply rather than comply (since 4>2 and 0>-2) ; the government's dominant strategy is always to play Coerce rather than trade services for compliance (since 2>1 and 0>-1); hence no fiscal contract materialises.

Table 2.6a. The pre-fiscal contract situation

		Options for government ('trustee')	
		Implement delivery of services and *'trade'* this for payments of taxes	*Coerce* the taxpayer without offering any benefits in return
Options for taxpayer ('truster')	Pay tax ('*Comply')*	*Quadrant I* (2,1)	*Quadrant II* (-2,2)
	Not pay tax *('Not comply'*)	*Quadrant III* (4,-1)	*Quadrant IV* (0,0)

Entries in cells of the four quadrants are presented in the order (taxpayer, government).
Note: the shaded area denotes the dominant-strategy equilibrium outcome. This diagram is reproduced from Lenton, Masiye and Mosley (2017)

However, if we imagine a reform in the tax base, for example that it evolves from being principally based on trade taxes to being increasingly based on income and consumption taxes, such as occurred in many developing countries in the 1990s and 2000s under the impetus of economic crisis and IMF adjustment loan packages, then that can be expected, especially if accompanied by evidence of increasing social expenditure and less misuse of tax revenue, to lead to sustainably higher tax ratios and higher and better-quality public expenditure, and these can bring about a shift to the top left-hand (fiscal contract) equilibrium. If for example we imagine that, following reforms of the type described, G* increases from 4 to 6, the sanction attached to non-payment of tax (S) increases from 0 to 2, and the utilities attached by taxpayers to government expenditure (α) and payment of tax (β) move to 2 and -0.5 respectively, then the payoffs are as indicated in Table 2.6b, and the dominant strategy equilibrium moves towards a 'fiscal contract' in the top left-hand corner.

Table 2.6b. A possible post-fiscal contract equilibrium

		Options for government ('trustee')	
		Implement delivery of services and *'trade'* this for payments of taxes	*Coerce* the taxpayer without offering any benefits in return
Truster (taxpayer) Options	Pay tax ('comply')	*Quadrant I* (10,3)	*Quadrant II* (-1, 2)
	Not pay tax ('not comply')	*Quadrant III* (6, -1)	*Quadrant IV* (-4, -2)

Entries in cells are presented in the order (taxpayer, government)

Note: the shaded area denotes the dominant-strategy equilibrium outcome (which may be interpreted as a form of fiscal contract). This diagram is reproduced from Lenton, Masiye and Mosley (2017).

For the taxpayer, compliance is now better than non-compliance whatever choice the state makes (since 10>6 and -1 > -4) and for the state, it is now better to improve service delivery and 'trade' that for higher tax payments than to coerce (since 1>-1 and 2 <-2). Thus better service delivery, in association with changes in tax structures and democratisation, has played a key part, in this model, in incentivising trust between taxpayers and governments (Lenton and Mosley, 2011): that is, in bringing about patterns of behaviour (which we can style as fiscal contracts, even though they are most often unspoken and implicit, rather than explicit) which then make possible sustained improvements in tax ratios, in defiance of the short-term political risks associated with raising taxes especially in fragile states. Empirical evidence has gradually built up, initially for the United States (Scholz and Pinney 1995, Scholz and Lubell 1998) and more recently at micro-level for parts of Africa (Bodea and Le Bas 2013, Ali *et al* 2014) which suggests that taxpayers are more willing to pay taxes if they evaluate related public services as being satisfactory. Of course, 'satisfactory' is a subjective and often ambiguous term. Two of the meanings which have been attached to it relate to improved quality of outcomes (as in the case of reforms in public health services which reduce mortality rates, or educational reforms which increase pass rates in examinations) and improved breadth of coverage (as in the case of services which used to be made available to privileged social groups only and are now much more widely available), and we shall make use of the second of these meanings in our modelling below. In recent years, a number of developing-country governments, initially in Latin America but now spreading to Africa, have sought to capitalise on the second of these meanings by proposing 'fiscal contracts' which are explicit rather than implicit: e.g. tax increases which are earmarked to specific increases in

expenditure which are expected to yield political benefits, often targeted on lower income groups[10]. Explicit fiscal contracts of this sort we refer to as 'linked taxation', and we discuss them further below.

In achieving this transition from deadlock without trust to a fiscal contract with mutual trust, the sequence of moves is once again important. In particular, in the game portrayed above, it is the government, which is relatively powerful and unlike taxpayers directly controls the instruments of fiscal management, which needs to make the opening move, by portraying itself through its actions as trustworthy: thus, the taxpayer's dilemma is a dilemma for government also. In the example portrayed above, this opening move is executed through actions on the expenditure side, i.e. the delivery of better public services and better publicity which between them give the taxpaying public the feeling that they are getting something useful in return for the taxes they pay, rather than simply being coerced. However, it can also be done by reforms on the tax side, which show that the burden of taxation is being borne more by richer than by poor people. An example of this is provided by Ghana and Uganda, both of which in the early 1990s reduced (in the case of Uganda completely removed) implicit taxes on exports of, respectively, cocoa and coffee, which fell heavily on low-income producers of crops and their employees. These low-income taxpayers thus received evidence of government's commitment to a fairer distribution of the tax burden which proved an important bargaining tool in building their trust and laying the basis for future extensions of the tax base and increases in the tax ratio. Other first moves are possible, including amending the structure of taxation away from consumption taxes and towards income taxes, which may be expected to make the distribution of income more progressive (di John, 2006) and closing tax loopholes, notably exemptions from corporate income tax enjoyed by multinational corporations.

[10] In a number of Latin American countries legislators have shown an increasing tendency to promise that new taxes will be committed to particular forms of social expenditure, often as a way of softening the blow. Often these commitments are purely informal, as in the case of Brazil and Chile (Barrientos 2013:192-193), but in three cases, Bolivia, Ecuador and Venezuela, the commitment is contractual (Mosley and Abdul-Gafaru 2016). In the case of Bolivia, there is evidence that two of the main social welfare payments which are earmarked to be paid out of specific tax revenues – the *Renta Dignidad*, or universal old-age pension, , and the *Bono Juancito Pinto*, an educational subsidy for lower income children, both of which are mainly financed out of taxes on oil and gas production, there is evidence that these specific tax-linked social benefits have impacted heavily and favourably on both headcount poverty and the popularity of the government (Arauco 2014). More recently, this kind of earmarking of tax revenues has spread to Africa, and in section 4 below we examine attempts to construct fiscal contracts of this kind in Ghana and Zambia.

2.4. Empirical approach

The empirical approach in this chapter, as in the next substantive chapters, is 'qual-quant', combining panel-data regression analysis across a sample of African countries as the main analytical framework, with two country case studies involving Ghana and Zambia, as special references[11] (in section 2.6). This two-track approach, which is not often employed in the conventional tax effort literature, allows us to first model the revenue function based on the influences identified and discussed in the previous section, and those recognised in the literature. Within the first stage we also account for the potential econometric issues of endogeneity that could possibly bias the results. In the second step, which appears at the end of the chapter, we relate the findings from panel regressions to the evolution and development of revenue performance in Zambia, by highlighting particularities of causation which do not emerge properly from the panel regressions.

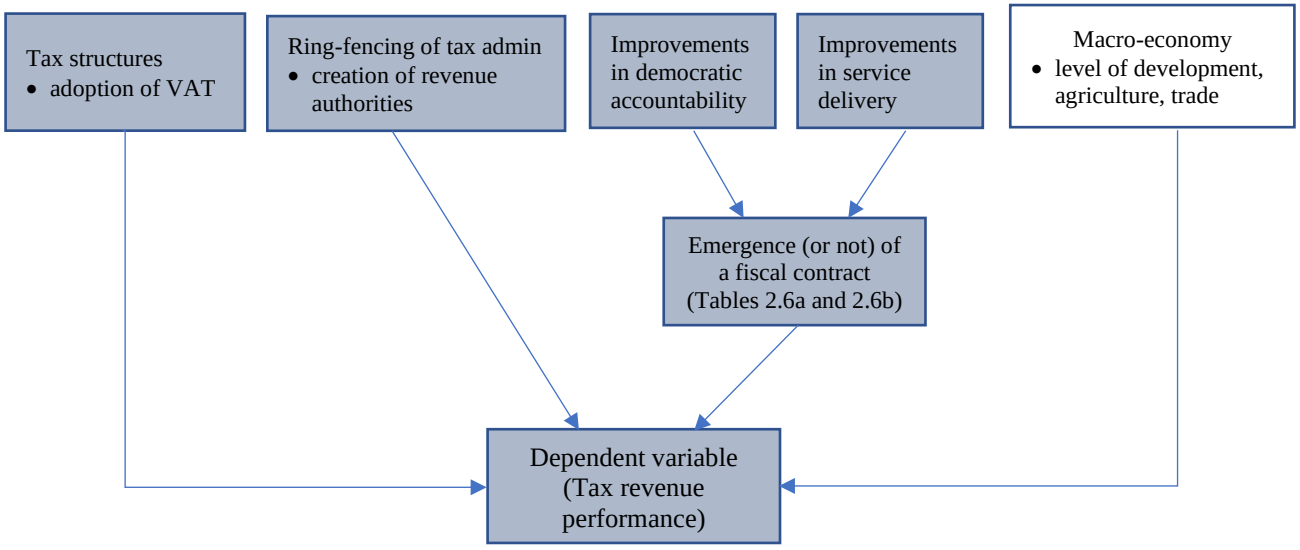
Our arguments so far, as discussed in section 2.3, are that some tax innovations have been suggested and implemented in developing countries as part of the global effort to remedy poor tax revenue performance: tax reforms implemented to improve the quality of tax structures by the adoption of the VAT; ring-fencing of the process of revenue collection from political corruption and patronage by creating ARAs ; and improvements in democratic accountability and the delivery of better services to taxpayers (G*, in the prisoner's dilemma model above), among other policies, are likely to facilitate the establishment of a stable 'fiscal contract' in which the tax base is broadened and, thereby the tax ratio is raised in a way that makes the provision of developmental services possible.

However, to convert these basic arguments in our core model into a formulation which will give us a picture of how tax ratios are impacted by the reforms we describe, we need to bring into the story, as controls, those influences which have long been recognised in the conventional tax literature as important determinants of tax yields Previous studies have included a number of

[11] Zambia was selected as a special reference to fulfill the requirements of the sponsors of my PhD studies, the Zambia Ministry of Finance, of understanding the causes and consequences the fiscal challenges the country was experiencing at the time and how to deal with them: declining tax performance, rising public debt, the persistent fiscal deficits and a decline in economic performance

variables presumed to affect a country's ability to build up tax revenues, such as the overall level of development, sectoral composition of the tax base and the economy's openness to international trade. Tax revenues are likely to be positively influenced by a country's overall level of development as higher incomes increase the ability to pay and collect taxes, while overall development is associated with higher literacy rates, increased monetisation and better law enforcement (Lotz and Morss, 1967; Chelliah, 1971). The sectoral composition of the tax base is another important determinant of tax collection because certain sectors are less amenable to taxation than others. In this study involving developing countries the share of agriculture in the economy may be an important determinant (being one of the largest sectors) as it is not easily amenable to taxation because the subsistence nature of most of the activities in the sector makes it difficult to produce taxable surpluses (Stotsky and WoldeMariam, 1997; Ghura, 1998). Finally, a country's openness to foreign trade is included to try and capture the combined effects on current tax revenues of the ease of collection due to the few locations where trade takes place but also the reduction in trade taxes since the late 1980s due to trade liberalisation and integration. Thus, the effect of foreign trade on tax revenue remains an empirical issue. Feeding these controls into the ideas of our main story above, leads to our baseline model which we graphically depict as Figure 2.5.

Figure 2.5: The baseline model



Notes: The baseline model shows the direction of impact of each of our key explanatory variables (in shaded boxes) and other conventional controls in the plain box.

2.4.1 Model specification

The standard approach typically used in the tax literature is to specify a model that links the dependent variable, in this case tax revenue performance, to a combination of explanatory variables that are conjectured here to affect the dependent variable. The specified model is then regressed on a sample of countries, and the estimated coefficients of the explanatory variables can be interpreted as the potential "average" impacts on the dependent variable. We closely follow this approach, also used in Lotz and Morss (1967), Chelliah *et al*. (1975), Keen and Lockwood (2010), Ahlerup *et al*., 2015, and Dom(2019) and other papers, but augment it with the ideas of a stable 'fiscal contract' as discussed above and outlined in our baseline model in Figure 2.6, to specify a testable equation. Thus, the reduced form equation which will enable us to properly assess the statistical impact of the implementation of the VAT, creation of an autonomous revenue authority and the emergence of 'fiscal contracts' is specified as shown in equation (2.1):

$$TR_{it} = \alpha + \beta VAT_{it} + \gamma ARA_{it} + \delta DA_{it} + \zeta SD_{it} + \sum_{j=1}^{3} \theta_j Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.1)$$

where:

TR_{it}, the main dependent variable for this chapter, is total tax revenues expressed as a percentage of GDP in country i at time (year) t, and is a proxy measure for a country's revenue performance. An increase in the size of the variable TR represents better tax revenue performance and vice versa;

VAT_{it} is a dichotomous dummy variable created to capture the adoption of the VAT and is equal to one if country i has a value added tax in year t, and zero otherwise. The estimated coefficient of the VAT_{it} variable, $\hat{\beta}$, is to be positive ($\hat{\beta} > 0$);

ARA_{it} is a dichotomous dummy variable created to capture the operational presence of an autonomous revenue authority and is equal to one if it is operation in country i at time (year) t, and zero otherwise, as per the practice of Dom (2019); this one-zero specification, of course, limits the amount of information which we can gather concerning the qualitative

impact of this policy measure. The revenue impact of an autonomous revenue authority is expected to be positive, i.e., its estimated coefficient, $\hat{\gamma}$, is projected to be positive which captures the $(\hat{\gamma} > 0)$;

DA_{it} is our democratic accountability measure, which captures one of the key factors that are crucial in the emergence of a 'fiscal contract' and is measured on a scale that ranges between -10 (full autocracy) and +10 (full democracy). The coefficient $\hat{\delta}$, which captures the impact of improvements in democratic accountability on tax revenues (through fiscal contracts) is expected to be positive $(\hat{\delta} > 0)$;

SD_{it} is indicator of effectiveness or improvements in service delivery. As an indicator of the effectiveness of public expenditure, we use the share of public expenditure spent on human capital (health and education) in GDP, which we interpret as a measure of the productivity of the social wage, following the approach taken in Hudson, Lenton and Mosley (2015). This indicator is derived from the approach of new growth theory, in which expenditures which create new applied knowledge, notably health and education, make an additional contribution to growth (Romer 1986; Lewis, 1988; Barro, 1991) because they impact both on GDP and on the growth of productivity, and thus exhibit increasing returns. It would be desirable to use a measure of expenditure effectiveness which better captures 'service delivery', as discussed in our theoretical section above. For the moment, too few survey datasets on attitudes to public expenditure exist for us to be able to explore this approach in our econometric analysis, but we take the service delivery issue further in the qualitative analysis of Section 2.6 below. For this reason, as noted above, many social protection schemes throughout the developing world have been made conditional on 'increased effectiveness of spending' in precisely this sense (Barrientos 2013, etc). The estimated coefficient of the variable SD_{it}, $\hat{\zeta}$ which measures the statistical influence of improvements in service delivery on the construction of a fiscal contract and ultimately tax ratios, is expected to be positive[12] $\left(\hat{\zeta} > 0\right)$;

[12] This service delivery measure suffers from the limitation of being correlated with total revenue, and therefore endogenous. We attempt to correct for this endogeneity in Lenton et al. (2017), which uses 3SLS estimation methods.

$Controls_{it}$ is a vector of three explanatory variables, shown in the unshaded box of Figure 2.6, representing the level of overall development represented by the country's GDP per capita (GDP_{it}), sectoral composition of the tax base proxied by the share of agriculture in the economy ($Agric_{it}$) and openness to international trade, measured by sum of imports and exports, as a proportion of GDP ($Trade_{it}$). The estimated coefficients of the variables GDP_{it} ($\hat{\theta}_1$) and $Trade_{it}$ ($\hat{\theta}_2$) are expected to be positive, whereas the estimated coefficient for $Agric_{it}$ ($\hat{\theta}_3$) is expected to be negative for reasons discussed above.

μ_i represents country-specific fixed effects to capture the unobservable heterogeneity across countries, λ_t represents time-specific fixed effects to control for unobservable time-specific characteristics within countries, and ε_{it} is an independent and identically distributed (*iid*) error term.

2.4.2 Estimation technique

Before discussing the estimation techniques employed in this chapter, we investigate whether our data is affected by some of the problems that are common in panel data. Our tests for the presence of autocorrelation and heteroscedasticity, reported in the notes to 2.10 indicate that autocorrelation is not likely to be a problem, but heteroscedasticity is potentially a more important problem in our data. Thus, using the standard pooled *OLS* estimator may bias our estimates. Another potential problem associated with the use of the pooled *OLS* is that it does not recognise the panel structure of panel data and therefore fails to use the information that is available across countries (heterogeneity), which can potentially be an important issue in long datasets. Finally, pooled OLS does not deal with one of the common problems in regression analysis, omitted variable bias, primarily caused by the possibility that the outcome of the dependent variable may be influenced by unobservable independent variables. These problems can (but not always) render results from the pooled *OLS* biased and inconsistent.

The two widely used panel data models to try and address some of these problems are *fixed effects* and *random effects,* which tend to control for unobserved or unmeasurable sources of inter-country heterogeneity and the effects of omitted variables (which violates the Gauss-Markov

assumptions lead to spurious correlations) and, thus, have become very popular. *Fixed effects* models try to address these problems by using within-country information and assume that within-country unobserved characteristics are not correlated with the error term, whereas *random effects* models use information within- and between-country information and presume that these unobserved variables are random. These models have the advantage of minimising the potential problem the presence of heteroscedasticity and autocorrelation. Either of these models has some weakness: *fixed effects* do not produce estimates for variables that do not change overtime and sometimes produce larger standard errors leading to overstated *p*-values and wider confidence intervals (Allison, 2009); when the strong assumption of no correlation between the unobservable and explanatory variables which the *random effects* models depend on is violated, this can lead to inconsistent and biased parameter estimates. A common approach frequently employed to guide the choice between these estimators is the Hausman test, which shows researchers the significance of the differences between parameters estimated from the two approaches.

We, therefore, take advantage of the strengths of each of the approaches and employ two-way *fixed effects* and *random effects* estimators in this study with the year dummies serving as time-specific fixed effects and country dummies as country-specific. Hausman tests are performed to appreciate the significance of the differences in the estimates and to be guided on the more efficient approach. These models are estimated by the econometric software package, Stata/IC 14.2. To try and minimise the effects of heteroscedasticity identified earlier, and the possible presence of autocorrelation, our results and test statistics are estimated with cluster-robust Huber/White standard errors, with the estimation option of *vce(robust)*.

2.4.3 Data description and summary

Our empirical analysis focuses on the period 1980 to 2013 and utilises annual data from an unbalanced panel dataset (due to missing data for some countries and in certain periods) involving a sample of 42 countries from sub-Saharan Africa. Several other African countries were excluded from our sample because of data limitations. Appendix 2.1 shows the panel of countries in our sample with standard rates and dates of the adoption of the VAT and operationalisation of ARAs in each country. Almost all the countries in our sample have adopted the VAT and 17 out of 42 of

them (the largest number globally) had established ARAs by 2013[13]. We focus on sub-Saharan African countries because, certainly in the sense examined here, these countries lag behind other continents in the developing world in terms of several dimensions of governance and especially tax revenue performance, in spite of implementing important fiscal reforms over the past decades. Also, several countries on the continent are making strenuous efforts to put in place more democratic systems of government. Understanding the effectiveness of some of these measures and what other policies can be considered to address the roots of poor tax revenue performance is, therefore, of utmost importance not only for Africa but also for other developing countries facing similar challenges in Latin America and Asia.

Data for our analysis were derived from various sources, as indicted in Table 2.7. Our main dependent variable is total government tax revenues expressed as a percentage of GDP, TR_{it}, which was downloaded from the Government Revenue Dataset (GRD) of the International Centre for Tax and Development/ United Nations University World Institute for Development Economics Research (ICTD/UNU-WIDER, 2018). This data was supplemented, for data prior to 1990, with data from Mario Mansour's 'A tax revenue dataset for sub-Saharan Africa: 1980-2010' published on www.ferdi.fr. The two sources provide a more consistent and verifiable dataset than most of the available alternative and have become very popular in tax effort studies.

The VAT variable, VAT_{it}, was created by coding a year as one if a VAT was adopted and implemented in that year for a particular country and zero otherwise. This classification helps to overcome possible gaps which may exist between the enactment of the relevant laws and the beginning of implementation of the tax, which is crucial in assessing true impact. The data on the VAT was first obtained from Ebrill *et al.* (2001), Keen and Lockwood (2010) and Ahlerup *et al.* (2015), and verified for consistency on actual implementation with Crowe (2016) and various country reports and government documents (for example, VAT laws, Tax Bulletins, Economic Reports). The years we use for purposes of creating the VAT dummy variable are the years when the VAT was actually implemented.

[13] Dom (2019) reports that the number of countries with autonomous revenue authorities had increased to 21 African countries by 2015, and that Africa remains the continent with the largest number of autonomous revenue authorities.

The process that guided the coding of the VAT was also employed here to create a dummy variable for ARAs ,(ARA_{it}) except in this case the basis was the operational presence as opposed to the legal creation of the revenue authority. A dummy variable equal to one was created if an autonomous revenue authority was operational and zero otherwise. The data on the operational presence of the autonomous revenue authority was derived from Crandall (2010), Fjeldstad and Moore (2009), Ahlerup *et al*. (2015) and Dom (2019) and cross-checked with country reports similar to those mentioned above.

Data on expenditure spent on human capital (health and education in GDP), and the controls, namely GDP per capita, shares of agriculture and trade in GDP were drawn from the World Bank's *World Development Indicators* and IMF's *World Economic Outlook.* Finally, the data for our case study section (qualitative) were from the sources published by respective governments such as ministries of finance, central statistical office, central banks and revenue authorities. The only part of the research where ethical issues may potentially arise is that the case-study part of the thesis involved few interviews. However, interviewees were assured in advance of the interview that they were not obligated to answer any questions and could terminate the interview at any time.

Table 2.7 provides the notation and interpretations of the variables included in the empirical estimations as well as the sources from which they have been obtained. A summary of the data relating to these variables is provided in Table 2.8.

Table 2.7: Notation and sources

Variable Symbol	Meaning	Source
TR_{it}	An indicator of government total tax revenues from taxes, social contributions, and other revenues such as fines, fees, rent, and income from property or sales	Government revenue dataset (GRD) ICTD/UNU-WIDER (2018); A tax revenue dataset for sub-Saharan Africa: 1980-2010'; www.ferdi.fr
VAT_{it}	A dummy variable coded as one when a VAT has been operational in that year, and zero otherwise.	Ebrill *et al.* (2001), Keen and Lockwood (2010) Ahlerup *et al.*(2015), Crowe (2016),
ARA_{it}	A dichotomous dummy variable equal to one is operational in that year, and zero otherwise.	Crandall (2010), Fjeldstad and Moore (2009), Ahlerup *et al*. (2015), Dom (2019).
DA_{it}	A measure of institutionalised accountability and measures political competitiveness, participation, openness and constraints on the president or chief governmental executive.	Teorell *et al*. (2009), University of Gothenburg Quality of Government database (www. qog. pol. su.se); Database of Political Institutions (2016), Centre for Systemic Peace, polity IV Project

SD_{it}	An indicator of service delivery measured by the combined shares of public spending on education and health (% of GDP).	World Bank, *World Development Indicators*
Education spending	One of the two components that make up the service delivery indicator (above)	World Bank, *World Development Indicators*
Health spending	One of the two components that make up the service delivery indicator (above)	World Bank, *World Development Indicators*
GDP_{it}	An indicator of a country's level of development proxied by real GDP per capita, based on the purchasing power parity in constant 2011 international dollars.	World Bank, *World Development Indicators*
$Agric_{it}$	The share of agricultural sector, value added, in GDP.	World Bank, *World Development Indicators*
$Trade_{it}$	Trade openness is a measured as a share of the sum of all imports and exports of goods and services in GDP.	World Bank, *World Development Indicators*
$Debt_{it}$	Measures a country's stock of external debt as a share of national income, and includes use of IMF credit, and short-term debt.	World Bank, *World Development Indicators*
IMF_{it}	A dummy variable equal to one if country has an IMF programme (SBF, ESAF, PRGF or SAF) with tax measures as one of the conditionalities between 1990 and 2003. This period coincides with the time when tax reforms were pushed on many African countries.	Monitoring of Fund Arrangements (MONA) Database (1993-2010)
$Govt_{it}$	Bureaucratic effectiveness, an indicator of government ability to formulate and implement sound policies and commitment to such policies	World Bank, *World Governance Indicators*
$Corr_{it}$	Ability of the government to control political corruption	International Country Risk Guide (ICRG),
Law_{it}	Measures the extent to which citizens have confidence in and abide by rules	International Country Risk Guide (ICRG),

Table 2.8: Data and summary statistics

Variable	**Mean**	**Std. Dev**	**Min**	**Max**
Central government total tax revenues, percent of GDP (TR)	22.2	10.5	1.3	59.8
Adoption of the value added tax (VAT)	0.4	0.5	0	1
Operational presence of an autonomous revenue authority (ARA)	0.2	0.4	0	1
Democratic accountability (DA)	3.3	5.2	-10	10
Service delivery, spending on education + health, percent of GDP (SD)	10.2	3.2	3.7	19.2
Government spending on education, percent of GDP (Education)	4.3	2.0	1.0	13.2
GDP per capita, PPP constant 2011 dollars (GDP)	3339.0	3879.1	592.0	18,171.9
Share of agriculture value added, percent of GDP (Agric)	26.5	15.0	2.0	58.4
Openness to foreign trade, percent of GDP (Trade)	73.7	35.9	0.0	209.9
Stock of external debt, percent of GNI (Debt)	64.7	53.8	0.0	487.5
Existence of an IMF crisis programme (1993-2003) (IMF)	0.13	0.3	0	1
Bureaucratic effectiveness (Govt)	-0.7	0.6	-1.9	1.0

Corruption (Corr)	2.4	1.0	0	6
Rule of law (Law)	2.8	1.1	0	6

Sources: Primarily from ICTD/UNU-WIDER, World Bank *World Development Indicators*, IMF *World Economic Outlook* for the period 1980-2013. For further details see Table 2.7 above.

2.5. Empirical findings – quantitative results

Before presenting and discussing our empirical findings, it's useful to conduct some basic diagnostics to determine whether any of our explanatory variables could be correlated. The adverse consequences of multicollinearity between explanatory variables on the findings and interpretation of results is well-documented. Its presence can lead to higher variances and standard errors and lower t-statistics (a possible violation of the Gauss-Markov assumptions), and consequently lead to misleading interpretation of the findings. We employ the Pearson Product-Moment Correlation method to gain some insights into the nature of any association between the explanatory variables and the direction of such relationships. The Pearson pairwise correlation matrix is presented in Table 2.9.

Table 2.9: Pairwise correlations, explanatory variables

	VAT	**ARA**	**SD**	**DA**	**Agric**	**Trade**	**GDP**	**IMF**
VAT	1.0000							
ARA	0.3577*	1.0000						
	(0.0000)							
SD	-0.0023	0.4060*	1.0000					
	(0.9660)	(0.0000)						
DA	0.3978*	0.2282*	0.2993*	1.0000				
	(0.0000)	(0.0000)	(0.0000)					
Agric	-0.1076*	-0.0200	-0.1116*	-0.2316*	1.0000			
	(0.0001)	(0.4685)	(0.0395)	(0.0000)				
Trade	0.0179	-0.0437	0.1701*	0.1651*	-0.5713*	1.0000		
	(0.5032)	(0.1029)	(0.0014)	(0.0000)	(0.0000)			
GDP	-0.0229	-0.0363	0.0169	0.1502*	-0.6597*	0.4781*	1.0000	
	(0.4864)	(0.2696)	(0.7573)	(0.0000)	(0.0000)	(0.0000)		
IMF	0.1475*	0.0097	-0.1861*	0.1027*	0.1026*	-0.1045*	-0.1619*	1.000
	(0.0000)	(0.7177)	(0.0005)	(0.0002)	(0.0002)	(0.0001)	(0.0000)	

Note: The pairwise correlations, which depict partial correlations between two explanatory variables, were calculated using the data in our sample (see Tables 2.7 and 2.8). The Pearson correlation coefficient between two variables ranges between -1 (perfect negative correlation) and +1 (perfect positive correlation). A coefficient close to 0 (zero) indicates the lack of association between two variables.

The pairwise correlation matrix is one of the tools used to check for the presence (or not) of multicollinearity among the explanatory variables and the rule of thumb is that if the pairwise correlation estimate is greater than 0.8, then severe multicollinearity may be present. As can be observed in Table 2.9, the estimated partial correlations are less than 0.50, suggesting that multicollinearity is not likely to be a problem here.

2.5.1 Baseline results - value added tax, autonomous revenue authority and 'fiscal contracts'

In this section, we present our main findings about the impacts on government revenues of the implementation of the VAT, creation of ARAs and the construction of 'fiscal contracts'. Table 2.10 presents the results from the robust *OLS*, two-way *fixed effects*[14] and *random effects* specifications based on equation (2.1). Our strategy, which is quite common in this literature, is to introduce each of our variables of interest gradually. First, we run the baseline equation with policy reform variables, VAT and ARAs , together with the controls (GDP per capita, share of agriculture and openness to international trade). The results are reported in columns (1), (2) and (3). Second, we run the baseline equation with the elements that are crucial in the emergence of 'fiscal contracts', democratic accountability and effectiveness of service delivery and the same controls, and report the findings in columns (4), (5) and (6). Finally, we run the full baseline equation with all the variables as shown in columns (7), (8) and (9). As mentioned earlier, all specifications are estimated with cluster-robust white standard errors to minimise the potential effects of arbitrary heteroscedasticity and autocorrelation. We also calculate the Hausman test-statistic for purposes of comparing the fit of the *fixed effects* and *random effects* specifications. The p-values of the Hausman test statistics are all above 0.9, suggesting that the *random effects* specification is more consistent and, therefore, favoured over the *fixed effects*.

Both the *fixed effects* and *random effects* regressions indicate that the coefficient on the variable *VAT* is positive but not significant, signalling that the adoption of the VAT may have had a positive contemporaneous impact on tax revenues in Africa, but this effect is not significant enough to have a significant impact on tax revenues (except that in the OLS specification (7) in

[14] For fixed-effect estimation we use the specification recommended by Angrist and Mansoor (2009) and also implemented in Ahlerup *et al. (*2015)

Table 2.10, *VAT* exhibits *negative* significance). The null hypothesis that efforts to improve the quality of tax structures, and thus, revenue performance by adopting the VAT have not delivered on the revenue objective in Africa is not rejected. These findings suggest that on average countries in Africa which have adopted a VAT do not necessarily perform better in tax revenue collection than those without. One possible explanation for the lack of significant effect of the VAT is that its adoption may have not been able to adequately compensate for the revenue lost from the taxes it replaced. The policy implication of this finding is that, merely adopting the VAT does not guarantee better revenue performance over countries without the VAT. The finding also signals that the much-widely adopted tax has not been successful in realising its revenue objectives for which it was introduced.

Our results on the variable *ARA* also do not emerge as a significant correlate of tax yields across all our specifications. The estimated coefficient on the variable ARA is positive in the *fixed effects* specification and negative in the *random effects* specification, but insignificant in both cases. We, therefore, fail to reject the null hypothesis that ARAs have not provided an advantage for countries that have created them for revenue purposes in Africa. The policy implication of this finding, which is similar to Dom (2019), is that efforts to improve tax revenue performance by ring-fencing the process of revenue collection from political interference by simply transferring such processes to an autonomous revenue authority in order to improve public trust and improving tax compliance, may not necessarily deliver on this promise. It appears from these econometric results that the success of policy reforms such as the adoption of the VAT and the creation of ARAs in meeting revenue objectives remains controversial. One possibility for what is going wrong is that their revenue effects are influenced by several other factors, including the governance environment of the country, tax policy design, bureaucratic effectiveness and other political factors which may certainly impact their effectiveness. As can be observed from Table 2.2, these interesting and important conditioning influences have been less thoroughly studied in the analysis, leaving the true impact quite unclear. Even for the surprising results, existing studies do not offer explanations for particular causal factors which may underlie the lack of impact of these innovations. These are some of the issues we will come back to in the next and the case study sections of this chapter.

Turning to our governance variables that have been hypothesised to be crucial in the emergence of stable 'fiscal contracts', the results from both the *fixed effects* and *random effects* specifications, as well as the *OLS* specifications reveal that improvements in democratic accountability and the effectiveness (or quality) of service delivery (human capital spending) emerge as significant correlates of tax revenue performance. For both variables, we reject the null hypotheses of no impact and conclude that the 'fiscal contract' approach can improve tax revenue performance. The estimated coefficients indicate that improvements in democratic accountability can increase tax yields by an average between 0.01 and 0.02 percentage points of GDP, and improvements in service delivery (measured by spending on human capital) by one percent can improve tax yields by between 0.3 to 0.4 percentage points of GDP. Our results also clearly show that improving the effectiveness of service delivery has more influence in the emergence of the 'fiscal contract' than improvements in democratic accountability. The policy implication for developing countries is that making improvements in democratic accountability and creating a connection between the taxes which taxpayers pay to government and the services which they receive (and publicising that connection properly) – may be a possible solution to the problem of poor revenue performance in developing countries.

Again, like the issue of policy reforms, we gain more insights into how 'fiscal contracts' can help build up taxes in the developing countries is explored in more detail in the case study section, as part of our contribution to the literature.

Table 2.10: Value-added tax, autonomous revenue authority and 'fiscal contracts' - baseline regressions [equation 2.1]

Estimation method Explanatory variables	OLS (1)	FE (2)	RE (3)	OLS (4)	FE (5)	RE (6)	OLS (7)	FE (8)	RE (9)
Adoption of the value-added tax (VAT_{it})	-0.011 (0.300)	0.046 (1.100)	0.039 (0.970)				-0.095** (2.420)	0.038 (0.720)	0.007 (0.150)
Creation of an autonomous revenue authority (ARA_{it})	0.006 (0.200)	0.076 (1.450)	0.038 (0.840)				-0.027 (0.990)	0.016 (0.320)	-0.002 (0.040)
Democratic accountability (DA_{it})				0.004 (1.490)	0.022*** (3.860)	0.011** (2.650)	0.007** (2.480)	0.022*** (3.740)	0.011** (2.660)
Effectiveness of service delivery (SD_{it})				0.406*** (7.790)	0.347*** (4.550)	0.308*** (5.210)	0.401*** (7.310)	0.342*** (4.450)	(0.309)*** (4.980)
Agriculture share in GDP ($Agric_{it}$)	-0.181*** (5.720)	-0.287*** (4.350)	0.231*** (4.860)	-0.208*** (6.120)	-0.121 (1.550)	-0.160*** (3.530)	-0.221*** (6.680)	-0.116 (1.470)	-0.157*** (3.350)
Foreign trade share in GDP ($Trade_{it}$)	0.317*** (7.190)	0.315*** (5.830)	0.308*** (6.240)	0.209*** (5.450)	0.304*** (4.650)	0.289*** (5.740)	0.206*** (5.130)	0.301*** (4.530)	0.290*** (5.610)
GDP per capita (GDP_{it})	0.017 (0.520	-0.149* (1.870)	-0.045 (0.950)	-0.128*** (3.740)	0.021 (0.160)	-0.079 (1.640)	-0.138*** (4.110)	0.013 (0.100)	-0.076 (1.530)
Constant	2.091*** (5.180)	3.748*** (5.550)	2.815*** (5.670)	2.818*** (7.900)	1.063 (0.970)	2.138*** (4.090)	3.032*** (8.750)	1.104 (1.101)	2.096*** (3.890)
R^2	0.337	0.196	0.349	0.472	0.425	0.480	0.483	0.427	0.476
Observations	732	732	732	313	313	313	313	313	313
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman's test (Prob>chi2)		0.9999			0.9755			0.9322	
Time-specific fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Country-specific fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes

Notes: The dependent variable is total tax revenues as a share of GDP. As described in Table 2.7, explanatory variables of interest: VAT and ARA are dummy variables and service delivery is the share of education and health spending (human capital) in GDP. Control variables: agriculture and trade as shares of GDP and GDP per capita. All *fixed effects* and *random effects* specifications include country and year fixed effects. All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).
The reason why the number of observations changes from 732 in columns (1)-(3) to 313 in columns (4)-(9) is the fewer observations available for the education and health expenditure variables, derived by ourselves based on the *World Development Indicators.*
Test for the presence of autocorrelation (Wooldridge test): F(1, 30) = 3.495; Prob > F = 0.0714
Test for heteroscedasticity (Breusch-Pagan / Cook-Weisberg test): Chi2(1) = 34.26; Prob > chi2 = 0.0000
These tests indicate that autocorrelation is not likely to be a problem, but heteroscedasticity is potentially a more important problem in our data.

Finally, we consider the findings on the controls recognised as important influences in the literature and included in our model. The results from the *random effects* specification (which according to the Hausman test statistics in Table 2.10 are more consistent than the *fixed effects* estimates) indicate that the sectoral composition of the tax base measured by the share of agriculture in the economy and a country's openness to foreign trade emerge as significant correlates of tax revenue performance in Africa. Both the *fixed effects* and *random effects* estimations fail to establish the role of overall level of development as a significant determinant of revenue performance in Africa, which is not consistent with the theoretical suggestion that GDP per capita is linked to the capacity to pay and collect taxes. The results also indicate that increasing the compositional size of agriculture in the tax base by 1 percent lowers the tax yield by between 0.2 and 0.4 percent of GDP, confirming earlier findings that because it is one of the hard-to tax sectors, the large share of agriculture has contributed to poor revenue generation in developing countries. The degree of a country's openness to international trade improves revenue collections by about 0.30 percent of GDP. These findings, which are significant at the conventional 5 percent significance level, are consistent with previous findings (for example, Leuthold, 1991; Ghura, 1998; Stotsky and WoldeMariam, 1997; Gupta, 2007).

The central message from our baseline regressions is that the true revenue impact of the VAT and ARAs remains unclear, however, we find strong evidence that improvements in democratic accountability and the quality of government service delivery can lead to the emergence of a 'fiscal contract', which is a possible solution to the problem of poor revenue generation in poorer developing countries.

2.5.2 Lags and possible causal effects – VAT, ARA and 'fiscal contracts'

As mentioned earlier, a possible concern with policy reforms is that they are complex and their beneficial gains may take a while to materialise (Acemoglu, 2005; Ahlerup *et al*., 2015; Dom, 2019). These studies suggest that the explanatory power of policy and institutional variables may be weaker over short horizons but may improve over time. Assessing the potential benefits of policy reforms such as the adoption of the VAT and creation of ARAs based on our baseline model ignores these important aspects and could possibly be the reason for the failure to capture the true impacts of such reforms. Policy reforms tend to be complex and in this particular case may involve things like

changing organisational structures, recruiting and training (and retraining) relevant staff and conducting educational campaign for taxpayers and the public to build wider trust and acceptance among taxpayers and the public. Even when these policy reforms are implemented, some countries often have to make several refinements as they gain more experience over some years to fine-tune the policy or administrative structures to improve performance. Also, it will be useful to explore whether the results from our baseline model reported in Table 2.10, in particular lagging the policy variable effectiveness of service delivery, can be seen as a form of causation running from government offer of better public services to better tax revenue performance - the process which unlocked the door to a fiscal contract, or 'top left-hand corner equilibrium' in the prisoner's dilemma model of Tables 2.6a and Table 2.6b above.

To address the issue of whether VATs and ARAs only have impacts over the long-run and test the proposition that the beneficial gains of policy and institutional reforms may take some while to happen, we lag the three main variables of interest in equation 2.1 by between three and five years and assess the response of the tax ratio – the VAT, ARAs and the offer of improved services by government (modelled here as the combined share of health and education in total government spending, SD). Our econometric findings are reported in Table 2.11. The lags are introduced gradually, beginning with the lags of the variables VAT and ARA by three years with the results reported in columns (1) to (3), and then the lag of the offer of better public services by two years as reported in columns (4) to (6).

With the lag structures, the results indicate that the effect of the VAT is mostly insignificant in the short and medium term. The estimated coefficients across all the three specifications as reported in columns (1) to (3) are statistically insignificant both for the contemporaneous effect as well as for the three-year lagged effect. The results for an autonomous revenue authority now show that there is a contemporaneous increase in tax revenues following its creation of about 0.1 to 0.3 percentage points. However, the estimated coefficients on the lagged indicator of the autonomous revenue authority (ARA_{it-3}) emerge with a negative and statistically significant coefficient after three years and remain mainly insignificant over the long run. This finding, which is similar to the findings of Ahlerup *el at.* (2015), indicates that the creation of autonomous revenue authority may have led to contemporaneous improvements in tax revenue collections, but that this effect dissipates in the

medium to long term[15]. Possible explanations for this finding is that in spite of institutional reforms, the autonomy of revenue authorities has remained limited as they remain too beholden to the ministry of finance and the political leadership (the president), their budget autonomy and certainty tend to dissipated overtime as revenue authorities are increasingly subject to the broader deteriorating fiscal positions of African countries (as will be noted in Chapter 4) and African countries have failed to sustain revenue increases due to increasing levels fiscal corruption in tax administration observed in these countries. The implication of this finding is that poor countries may benefit more from the creation of ARAs by improving the institutional environment. This proposition is explored later on in this section as part of the process of checking the robustness of our findings.

To assess whether the offer of improved services by government which makes possible the emergence of a 'fiscal contract' which then leads to improvements in tax revenue collections in defiance of the political risks associated with higher taxes, can be seen as a possible causal link, we lag by two years the expenditure variable, which is modelled here as the share of health and education spending in government expenditure. The results which are reported in columns (4) to (6) suggest that improving the quality of services offered by the government, which makes it possible for a 'fiscal contract' to emerge, is causally connected with improvements in tax revenue performance. The estimated effect remains strong and significant across all specifications. The main conclusion from these findings is that increasing levels of democratic accountability and the value of public services that are provided in return for payment of taxes are significantly correlated and causally connected with increasing tax revenue performance, and can thus be a possible solution to the problem of poor revenue performance in developing countries.

[15] We consider medium term as three-year period and long term as any time beyond three years, a standard commonly followed by the World Bank, International Monetary Fund and various continental Development Banks (World Bank, 1999; IMF, 1999; Houerou and Taliercio, 2002)

Table 2.11: Regression results embodying lags and causal effects

Estimation method Explanatory variables	OLS (1)	FE (2)	RE (3)	OLS (4)	FE (5)	RE (6)
Adoption of the value-added tax (VAT_{it})	-0.038 (0.560)	0.024 (0.440)	0.002 (0.030)	-0.166*** (3.450)	0.135 (1.190)	0.025 (0.390)
Adoption of the value-added tax lagged 3 years (VAT_{it-3})	-0.058 (0.980)	0.020 (0.400)	-0.048 (0.910)			
Creation of autonomous revenue authority (ARA_{it})	0.302*** (4.880)	0.057 (0.970)	0.121** (2.030)	-0.025 (0.860)	-0.069 (1.100)	-0.044 (0.860)
Creation of autonomous revenue authority lagged 3 years (ARA_{it-3})	-0.349*** (5.280)	-0.056 (0.930)	-0.160** (2.300)			
Democratic accountability (DA_{it})	0.006** (2.150)	0.022** (2.590)	0.008* (1.700)	0.007** (2.240)	0.028*** (4.000)	0.011** (2.010)
Effectiveness of service delivery (SD_{it})	0.366*** (6.600)	0.345*** (3.770)	0.310*** (3.520)			
Effectiveness of service delivery lagged 2 years (SD_{it-2})				0.345*** (5.670)	0.289** (2.690)	0.294*** (3.460)
Agriculture share in GDP ($Agric_{it}$)	-0.200*** (5.900)	-0.116 (1.370)	-0.176*** (3.090)	-0.244*** (6.430)	-0.110 (1.380)	-0.153*** (2.710)
Foreign trade share in GDP ($Trade_{it}$)	0.187*** (4.600)	0.300*** (4.100)	0.252*** (3.970)	0.258*** (5.820)	0.348*** (5.520)	0.330*** (6.050)
GDP per capita (GDP_{it})	-0.106*** (3.020)	0.023 (0.130)	-0.084 (1.400)	-0.162*** (4.370)	0.175 (0.680)	-0.059 (0.830)
Constant	2.885*** (8.270)	1.023 (0.620)	2.405*** (3.930)	3.276*** (8.120)	-0.313 (0.150)	1.816*** 2.730
Observations	313	313	313	265	265	265
R-squared	0.5160	0.4286	0.5386	0.4974	0.4053	0.4578
Time-specific fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific fixed effects	No	Yes	Yes	No	Yes	Yes

Notes: The dependent variable is total tax revenues as a share of GDP. As described in Table 2.7, explanatory variables of interest: VAT and ARA are dummy variables and service delivery is the share of education and health spending (human capital) in GDP. Control variables: agriculture and trade as shares of GDP and GDP per capita. All *fixed effects* and *random effects* specifications include country and year fixed effects. All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*)

2.5.3 Dealing with the endogeneity of key explanatory variables

Previous studies have recognised that fiscal reforms such as the adoption of the VAT and establishment of ARAs, tend to be endogenous with respect to revenue performance due to the problem of selection bias (Keen and Lockwood, 2010; Ahlerup *el al.*, 2015; Dom, 2019). An important issue in relation to this is that governments are more likely to make decisions to undertake these reforms when in fiscal crisis. Studies show that there are several reasons why governments take decisions to adopt the VAT or establish ARAs , but in Africa the primary reason is that these reforms are considered as panaceas to overcome low tax revenue performance. A possible critique of our baseline findings based on equation is that these variables have so far been treated as exogenous relative to tax revenue performance. The baseline results include country- and time-specific fixed effects and a number of explanatory variables but given the limited number of control variables in equation 2.1, however there is a possibility that there are certain important unobservable factors which may influence the likelihood of a country adopting the VAT or establishing ARAs . This is one potential source of the selection bias problem, and without addressing it our findings may be misleading. Therefore, being an important issue in determining the 'true' impact, it needs to be factored into any analysis of this sort. Also, we explore this issue in this section as part of testing how robust our baseline findings are to this endogeneity problem.

Studies have identified different ways of correcting the selection bias associated with the decisions to adopt a VAT or establish an autonomous revenue authority The two most common methods employed to purge this endogeneity are the *instrumental variable* approach (Dom, 2019) and a *two-stage* selection correction procedure (Keen and Lockwood, 2010; Ahlerup *et al.*, 2015). The challenge of finding suitable and valid instruments which are correlated with the two explanatory variables (VAT and ARAs) but are uncorrelated with the dependent variable (tax revenue performance), has limited the use of the *instrumental variable* approach in this chapter. Therefore, the strategy we employ here to tackle this problem is the *two-step* approach developed by Heckman (1979) and Maddala (1983) and employed by Keen and Lockwood (2010) and Ahlerup *et al*. (2015) in tax effort studies. This process is further elaborated below.

The *two-stage* selection correction method is a simple and consistent procedure, which enables researchers to estimate behavioural functions from non-randomly selected samples or in the presence of

'omitted variable ' bias by OLS (Heckman, 1979). In the first stage, a pooled *probit or logit* model on the determinants of the VAT or autonomous revenue authority (as dependent variables) is specified and estimated. Typical determinants of the VAT may include levels of overall development, a country's indebtedness, the extent to which government is held accountable, tax administration, stress of pressure of the IMF and a country's openness to foreign trade. Standard determinants of ARAs may include some of the drivers that also influence the VAT such as the overall level of development, public indebtedness, democratisation and openness to foreign trade, but also include the structure of the tax system, the influential role of bilateral aid donors and the ability to control corruption in tax administration. It is recognised in the literature that more developed, democratic and open countries are more likely to adopt the VAT and an autonomous revenue authority. The IMF and bilateral aid donors, which have muscled developing countries into implementing these reforms are more likely to be significant correlates with the decision to adopt the VAT and ARAs , respectively. Improved systems of tax administration are more likely to be associated with the decision to adopt better taxes such as the VAT, while better quality tax structures and the ability to control corruption are expected to strongly influence the establishment ARAs . The impact of public debt may be an empirical issue – as highly indebted developing countries may see it necessary to implement such reforms to raise taxes or may be too indebted and financially weak to implement such expensive reforms. According to Heckman (1979), Keen and Lockwood (2010) and other studies, the decisions to adopt the VAT and ARAs can, therefore, be specified as follows:

$$Prob[VAT_{it} = 1|X_{it}] = a + bX_{it} + \varepsilon_{it} \quad (2.2)$$

$$Prob[ARA_{it} = 1|Y_{it}] = c + dY_{it} + \varepsilon_{it} \quad (2.3)$$

where:

$Prob[VAT_{it} = 1|X_{it}]$ is the probability that country i is likely to adopt and implement a VAT in year t given a group of control variables represented by the vector X_{it};
$Prob[ARA_{it} = 1|Y_{it}]$ is the probability that country i will establish and operate an autonomous revenue authority in year t given a set of control variables represented by the vector Y_{it};

X_{it} is a vector of typical determinants of the decision to adopt a VAT and, as mentioned, includes an indicator of the level of overall development, GDP per capita; country's indebtedness (external

debt % of GDP); an indicator of the extent to which government is held accountable, operational presence of an autonomous revenue authority, influential role of the IMF (dummy variable equal to one if a country has an IMF programme with revenue reform measures in that year) and an indicator of a country's openness to foreign trade (trade % of GDP). These variables are also defined in Table 2.7;

Y_{it} is a vector of standard group of controls identified as possible influences of the decisions to establish an autonomous revenue authority and, as mentioned earlier includes an indicator of the level of overall development, GDP per capita; country's indebtedness (external debt % of GDP); an indicator of the extent to which government is held accountable, an indicator of the quality of tax structures (dummy variable for the operational presence of a VAT); influential role of bilateral aid donors (official development assistance % of GNI) and an indicator of a country's openness to foreign trade (trade % of GDP).;

b and d are the coefficients of interest in VAT and autonomous revenue authority behavioural equations; and
ε_{it} is an independent, identically distributed error term.

Equations (2.2) and (2.3) are estimated by the pooled *probit* and *logit* estimators on the same sample of 42 African countries over the period 1980 to 2013. The results of this first stage are reported in Table 2.12. The first two columns show results of the *probit* and *logit* specifications relating the likelihood of a country adopting the VAT to a set of variables contained in Y_{it}, and the last two columns show results linking the likelihood of creating an autonomous revenue authority to the same set of variables.

Table 2.12: Correlates of the likelihood of adopting VAT and ARA [equations 2.2 and 2.3]

Estimation method	Probit	Logit	Probit	Logit
Dependent variable	VAT	VAT	ARA	ARA
Explanatory variable				
GDP per capita (GDP_{it})	0.000	0.000	0.000	0.000
	(1.160)	(1.150)	(0.020)	(0.220)
External debt stock ($Debt_{it}$)	-0.004***	-0.007***	-0.006***	-0.010***
	(5.420)	(5.290)	(5.160)	(4.980)
Democratic accountability (DA_{it})	0.048***	0.079***	0.036***	0.060***
	(5.780)	(5.720)	(3.090)	(3.040)
Creation of autonomous revenue authorities (ARA_{it})	0.734***	1.206***		
	(6.420)	(6.090)		
Adoption of value added tax (VAT_{it})			0.379***	0.658***
			(2.830)	(2.850)
IMF programme with tax measures (IMF_{it})	0.342***	0.585***		
	(2.860)	(2.920)		
Bilateral aid (AID_{it})			0.024***	0.041***
			(3.080)	(3.050)
Control of corruption ($Corr_{it}$)			-0.131**	-0.216**
			(2.210)	(2.150)
Openness to foreign trade ($Trade_{it}$)	-0.001	-0.001	-0.007***	-0.012***
	-0.510	-0.610	(2.870)	(2.980)
Constant	0.359***	0.616***	0.050	0.084
	(2.780)	(2.850)	(0.210)	(0.210)
Observations	897	897	687	687
Pseudo R-squared	0.1314	0.1308	0.1126	0.1115

Note: The dependent variables are the probability of adopting the VAT and autonomous revenue authority. Estimation techniques are probit and logit, with robust standard errors in the parenthesis. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

Although the estimation results in Table 2.12 are for purposes of calculating the selection correction factors, they point to some key elements – they confirm the suggestion that the widespread adoption of the VAT and the creation of ARAs in poor countries are linked to the major role played by the IMF and bilateral aid donors, respectively. The results also indicate that the continent's increasing democratisation (especially after the 1990s) expressed itself in even more likelihood of reforming tax systems with high expectations of building up taxes. Surprisingly, our results show no evidence of a strong link between the adoption of the VAT and/or ARAs and a country's level of development, signalling the possibility that the question of affordability may not have deterred poor countries from reforming their tax systems.

In the second step towards addressing the selection bias, we use the estimated results from the pooled *probit, or logit* models based on equations (2.2) and (2.3) to compute the *inverse Mills ratio (IMR)*, which are designated in the literature as bias-correction factor. Following Heckman (1979), Maddala (1983), Vella and Verbeek (1999) and Keen and Lockwood (2010) the *inverse Mills ratios* are estimated as follows:

$$IMR_{VAT} = \begin{cases} \dfrac{\emptyset(\hat{b},\ X_{it})}{\Phi(\hat{b},\ X_{it})}, & VAT_{it} = 1 \\ -\dfrac{\emptyset(\hat{b},\ X_{it})}{1-\Phi(\hat{b},\ X_{it})}, & VAT_{it} = 0 \end{cases} \qquad (2.4)$$

$$IMR_{ARA} = \begin{cases} \dfrac{\emptyset(\hat{d},\ Y_{it})}{\Phi(\hat{d},Y_{it})}, & ARA_{it} = 1 \\ -\dfrac{\emptyset(\hat{d},\ Y_{it})}{1-\Phi(\hat{d},\ Y_{it})}, & ARA_{it} = 0 \end{cases} \qquad (2.5)$$

where:

IMR_{VAT} = *inverse Mills ratio* for the adoption of the VAT,

IMR_{ARA} = *inverse Mills ration* for the creation of autonomous revenue authority,

φ = standard normal density function, and

Φ = standard normal cumulative distribution function.

The variables b, d and Y_{it} are defined above.

The estimates of the respective *inverse Mills ratios* are then embedded into our baseline model (equation 2.1) as independent variables and re-specified as equations (2.6) and (2.7) as shown below. The estimated *inverse mills ratios* are presumed to capture the influence of most of the unobservable factors that influence the tax revenue and the likelihood of the reforms. They are also assumed to be exogenous and their inclusion addresses the endogeneity problem of selection, and therefore estimates of the policy reform variables in question are expected to be unbiased. Feeding the selection correlation factors, the *inverse Mills ratios*, into our baseline gives us the following extended equations:

$$TR_{it} = \alpha + \beta VAT_{it} + \gamma ARA_{it} + \delta DA_{it} + \zeta SD_{it} + \sum_{j=1}^{3} \theta_j Controls_{it} + \vartheta IMR_{VAT} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.6)$$

$$TR_{it} = \alpha + \beta VAT_{it} + \gamma ARA_{it} + \delta DA_{it} + \zeta SD_{it} + \sum_{j=1}^{3} \theta_j Controls_{it} + \tau IMR_{ARA} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.7)$$

The inclusion of the *inverse Mills ratios* in our estimating models limits our estimation techniques to *OLS* as the *fixed effects* and *random effects* techniques do not perform better than the *OLS*. The inclusion of the selection correction factors, IMR_{VAT} and IMR_{ARA} allows for the coefficients on the variables VAT and ARA, ϑ and τ respectively, to be estimated and interpreted with minimum risks of bias. A statistically significant coefficient on the selection correction factor suggests that it is crucial to control for the endogeneity problem in the estimates because certain unobservable factors significantly influence both the tax ratio and the decisions to adopt the VAT or the creation of an autonomous revenue authority. The estimation results which take into account the potential endogeneity problem as discussed are reported in Table 2.13. Estimates based on equations (2.6) and (2.7) are collected in columns (1) and (2), whereas in column (3) we report findings when both *inverse Mills ratios* are included in the same equation.

The estimated results for the selection correction factors, the *inverse mills ratios* for both variables do not emerge as strong correlates of the tax ratio. The estimated coefficient on the selection factor for the VAT is about -0.02, whereas the one for the ARA is between 0.07 and 0.14, but both are statistically insignificant, suggesting that the unobservable factors may have an impact on the policy decisions relating to the adoption of the VAT and the creation of the autonomous revenue authority, but this had no influence on tax revenues. We, therefore, conclude that the endogeneity problem of selection may not be a major concern to affect the reliability of our previous findings.

Table 2.13: Tax revenue performance – embodying selection factors [equations 2.6 and 2.7]

Estimation technique Equation	OLS (1) (2.6)	OLS (2) (2.7)	OLS (3)
Adoption of value added tax (VAT_{it})	0.037 (0.750)	0.011 (0.190)	-0.014 (0.220)
Creation of autonomous revenue authority (ARA_{it})	0.064 (0.960)	0.015 (0.340)	0.093 (1.190)
Democratic accountability (DA_{it})	0.024*** (4.060)	0.021*** (3.190)	0.024*** (3.990)
Effectiveness of service delivery (SD_{it})	0.328*** (4.140)	0.343*** (4.250)	0.322*** (3.980)
Agriculture share in GDP ($Agric_{it}$)	-0.119 (1.470)	-0.125 (1.500)	-0.145* (1.680)
Foreign trade share in GDP ($Trade_{it}$)	0.298*** (4.110)	0.294*** (3.960)	0.284*** (3.770)
GDP per capita (GDP_{it})	0.017 (0.130)	0.044 (0.340)	0.056 (0.430)
Inverse Mills ratio for VAT (IMR_{VAT})	-0.015 (0.990)		-0.024 (1.250)
Inverse Mills ratio for ARA (IMR_{ARA})		0.068 (0.620)	0.135 (1.060)
Constant	1.110 (1.000)	0.856 (0.760)	0.903 (0.800)
Observations	313	306	306
R-squared	0.8216	0.8178	0.8190
Country-specific fixed effects	Yes	Yes	Yes
Time-specific fixed effects	Yes	Yes	Yes

Notes: The dependent variable is total tax revenues as a share of GDP. As described in Table 2.7, explanatory variables of interest: VAT and ARA are dummy variables and service delivery is the share of education and health spending (human capital) in GDP. Control variables: agriculture and trade as shares of GDP and GDP per capita. All *fixed effects* and *random effects* specifications include country and year fixed effects. All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

2.5.4 Robustness checks – conditional impact of VAT and ARA

Although the literature has emphasised the major part played by the quality of policies and institutions in determining certain policy outcomes (World Bank, 2003; Burnside and Dollar, 2000), comparative studies have not thoroughly analysed how such factors can affect the success (or not) of policy reforms such as the adoption of the VAT and ARAs. This is particularly important here because institutional weakness is a common characteristic in countries in our sample (Block, 2002; Mosley and Chiripanhura,

2016). In this section we consider the role of the institutional environment within which reforms are implemented. Specifically, we examine whether the success of the VAT and ARA towards revenue objectives, for which they were primarily adopted in most poor countries, is influenced by a country's institutional environment. The basic idea which we explore here is whether the success of the VAT and ARA towards their revenue objectives is limited (or bolstered) by a country's institutional qualities within which these policy reforms are implemented. As mentioned in our previous discussion, we focus on institutional qualities that can reinforce tax collection efficiency: government effectiveness in formulating sound tax policies and the stability of such policies, and citizens' respect for and adherence to the rule of law. It is well acknowledged in the literature that a properly designed and stable tax system and adherence to the rule of law can reduce the cost of enforcement on tax administration and reduce burden of compliance on taxpayers, and thus increasing the overall collection efficiency and the taxpayer base. Therefore, it is expected that the VAT and ARAs will be more successful in countries with better bureaucratic quality and stronger adherence to the rule of law.

To capture the influence of these institutional variables on policy outcomes, we specify and estimate a model where our policy reform variables are interacted with measures of institutional quality mentioned earlier, using the approach employed in Keen and Lockwood (2010) and Ahlerup *et al*. (2015). The extended model, which is an extension of our baseline equation, is specified as follows:

$$TR_{it} = \alpha + \beta VAT_{it} + \gamma ARA_{it} + \delta DA_{it} + \zeta SD_{it} + \sum_{j=1}^{3} \theta_j Controls_{it} + \pi Govt_{it} + \tau Law_{it} + \varphi VAT_{it} * Govt_{it} + \psi ARA_{it} * Govt_{it} + \beta VAT_{it} * Law_{it} + \omega ARA_{it} * Law_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2.8)$$

where our indicators of the institutional environment are government effectiveness, $Govt_{it}$, which reflects perceptions on the quality and ability of a country's bureaucracy to formulate and implement sound policies, as well as its commitment to such policies, and rule of law, Law_{it}, which reflects perceptions on the confidence in and adherence to the country's rules and laws.

The extended model (equation 2.8) is estimated by *OLS, fixed effects* and *random effects* estimators, as in previous estimations. The four coefficients of interest, which capture the potential impact of a country's institutional quality on the success of VAT and ARA towards their revenue objectives, φ, ψ, β and ω are all assumed to be positive. The results are reported in Table 2.14. Institutional variables are

introduced and analysed progressively, first beginning with government effectiveness in columns (1) to (3), respect for and enforcement of the rule of law in columns (4) to (5). In columns (6) to (9) we incorporate both institutional variables in the same equation and analyse their impact.

Several interesting findings emerge from this analysis. Key results which are important for purposes of the robustness checks are the estimated coefficients and significance of the interaction terms in equation 2.8. Consistent with our previous findings in sections 2.5.1 and 2.5.3, the *OLS*, *fixed effects* or *random effects* estimators, we find in this section that on average the two policy reform variables of interest, VAT_{it} and ARA_{it}, have had little or no direct impact on tax revenue performance in Africa. The estimated coefficients on both variables remain highly insignificant across all specifications (as in previous estimates), perhaps indicating that although there are strong a priori reasons for expecting policy reforms which have involved the adoption of the VAT or creation of an autonomous revenue authority as panaceas for improving tax systems and revenue performance, these policies have been less successful in Africa. However, the finding in the case of the autonomous revenue authority should be interpreted with caution, as it appears to be sensitive to a country's institutional environment. The estimates from the *OLS* and the *random effects* specifications (which in this study is more consistent than the *fixed effects*) show that the interaction effects between our indicator bureaucracy and the dichotomous ARA_{it} variable is positive and statistically significant. The estimated coefficient on the interaction term, $ARA * Govt_{it}$, suggests, in our view, that the creation or operational presence of the autonomous revenue authority leads to a revenue advantage of 0.1 to 0.3 percent of GDP in countries with higher levels of bureaucratic effectiveness[16]. However, we find no evidence that the level of government effectiveness matters for how the VAT impacts tax revenues.

[16] It was pointed out in the oral examination that the claim made here is not secure, and that there is also evidence for the proposition that causation may run in the reverse direction, from the establishment of VAT and ARA authorities to governance, instead of, or as well as, in the opposite direction from VAT and ARAs to additional revenue generation as we contend.

Table 2.14: Results for the conditional impact of the VAT and ARA [equation 2.8]

Estimation technique Explanatory variables	OLS (1)	FE (2)	RE (3)	OLS (4)	FE (5)	RE (6)	OLS (7)	FE (8)	RE (9)
Adoption of value added tax (VAT_{it})	-0.060	-0.002	-0.024	-0.310	0.029	-0.225	0.054	0.036	-0.100
	(0.950)	(0.030)	(0.670)	(1.560)	(0.050)	(1.000)	(0.330)	(0.050)	(0.490)
Creation of autonomous revenue authority (ARA_{it})	0.069	0.038	0.045	-0.058	0.597	0.005	-0.012	0.675	0.036
	(1.440)	(0.590)	(0.750)	(0.340)	(1.230)	(0.020)	(0.060)	(1.310)	(0.130)
Democratic accountability (DA_{it})	0.005*	0.025***	0.011**	0.008**	0.019*	0.011	0.012***	0.024**	0.012**
	(1.790)	(3.200)	(2.420)	(2.220)	(1.710)	(1.620)	(2.620)	(2.310)	(2.000)
Effectiveness of service delivery (SD_{it})	0.429***	0.352***	0.322***	0.182**	0.449***	0.272**	0.246***	0.439***	0.274**
	(7.350)	(3.750)	(3.770)	(2.230)	(3.950)	(2.240)	2.960	(3.720)	(2.320)
Agriculture share in GDP ($Agric_{it}$)	-0.217***	-0.101	-0.151***	-0.190***	-0.094	-0.170***	-0.212***	-0.092	-0.192***
	(6.030)	(1.050)	(2.630)	(5.840)	(0.930)	(3.060)	(6.680)	(0.880)	(4.130)
Foreign trade share in GDP ($Trade_{it}$)	0.210***	0.297***	0.288***	0.263***	0.335***	0.317***	0.275***	0.347***	0.325***
	(4.250)	(3.530)	(4.450)	(4.250)	(3.290)	(4.050)	(3.950)	(3.100)	(3.400)
GDP per capita (GDP_{it})	-0.139***	0.049	-0.073	-0.032	-0.081	-0.012	-0.050	-0.086	-0.032
	(3.980)	(0.240)	(1.120)	(0.880)	(0.330)	(0.180)	(1.400)	(0.310)	(0.580)
Effectiveness of government bureaucracy ($Govt_{it}$)	0.117	0.011	0.038				0.316***	0.065	0.262***
	(1.610)	(0.110)	(0.510)				(3.840)	(0.300)	(3.380)
VAT*Effectiveness of government bureaucracy	0.042	-0.061	-0.035				0.022	0.169	-0.017
	(0.520)	(0.770)	(0.440)				(0.510)	(1.080)	(0.260)
ARA*Effectiveness of government bureaucracy	0.163***	0.069	0.131**				0.315***	0.034	0.230**
	(3.530)	(0.920)	(2.220)				(3.260)	(0.170)	(2.450)
Law and order (Law_{it})				-0.022	0.160	-0.006	0.131***	0.024	0.148**
				(0.390)	(1.010)	(0.090)	(2.840)	(0.240)	(2.300)
VAT*Law and order				0.060	-0.031	0.037	0.003	-0.030	0.034
				(1.000)	(0.170)	(0.570)	(0.060)	(0.160)	(0.530)
ARA*Law and order				0.011	-0.151	-0.002	0.027	-0.163	0.015
				(0.220)	(1.030)	(0.030)	(0.480)	(1.070)	(0.180)
Constant	2.879***	0.785	2.028***	2.455***	0.908	1.698**	2.134***	0.854	1.786***
	(7.440)	(0.410)	(2.950)	(5.490)	(0.470)	(2.400)	(4.950)	(0.400)	(2.840)
Observations	294	294	294	223	223	223	210	210	210
R-squared	0.4999	0.4059	0.4905	0.4390	0.4262	0.4864	0.4827	0.4233	0.5354

The dependent variable is total tax revenues as a share of GDP, as described in Table 2.7. All fixed effects and random effects specifications include country and year fixed effects. All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

We have similarly explored the interaction between our policy reform variables and other dimensions of the institutional environment pertinent to the ability to generate tax revenues in poor countries. The results for the interaction effects between a country's level of respect for and enforcement of the rule of law are surprisingly insignificant in both cases. In other words, how the VAT and ARAs affect tax revenue performance does not depend on citizens' respect and adhere to rule of law. This uninformative finding could be explained by the fact that the rule of law does not change much over time.

We have also explored the robustness of our findings by allowing for the interaction between lagged policy reform variables, instead of contemporaneous values like in Table 2.14, and the institutional environment. The re-estimated results are given in Table 2.15. The results in columns (1) to (3) do not include the selection correction factors and are based on OLS, *fixed effects* and *random effects* specifications, respectively. Columns (4) and (5) include the selection factors and are estimated by OLS only following the standard literature (for example, Keen and Lockwood (2010); Ahlerup *et al*. (2015)). It appears that our findings remain generally similar to our earlier results. The adoption of the VAT remains statistically insignificant whether its contemporaneous effects, lagged by three years or interacted with institutional quality. The creation of autonomous revenue authority improves tax collections but, similar to our previous finding in Table 2.14, but the effect dissipates over the medium to long term. Our sensitivity analysis also shows that the effectiveness of public expenditure continues to be strongly correlated with improvements in tax collections, but democratic accountability does not emerge as robust to this specification. We also observe that the quality of government bureaucracy matters for the effectiveness of the autonomous revenue authority but not the value added tax, as suggested by the positive and statistically significant coefficient on the interaction term. This result might suggest that better quality of bureaucracy increases the efficiency of revenue authorities in the short run.

The policy implication of this finding is that ARAs are more likely to successfully live up to revenue expectations in countries where government bureaucracy is more effective as such institutional qualities support the proficiency and effectiveness of the tax system. Thus, countries will benefit more from creating ARAs if they also improve government effectiveness.

Table 2.15: Robustness checks (lagged policy variables and interactions)

Estimation method Explanatory variables	OLS (1)	FE (2)	RE (3)	OLS (4)	OLS (5)
Adoption of value added tax (VAT_{it})	-0.013 (0.170)	0.019 (0.330)	0.006 (0.120)	-0.001 (0.010)	-0.106 (1.250)
Creation of autonomous revenue authority (ARA_{it})	0.299*** (4.380)	0.061 (1.020)	0.126** (1.990)	0.260*** (3.030)	0.265*** (3.450)
Value-added tax lagged 3 years (VAT_{it-3})	-0.098 (1.420)	0.007 (0.140)	-0.084 (1.460)	-0.118 (1.430)	-0.112 (1.520)
Autonomous revenue authority lagged 3 years(ARA_{it-3})	-0.292*** (3.780)	-0.055 (0.900)	-0.114 (1.430)	-0.264*** (2.920)	-0.267*** (3.290)
VAT lagged 3 years*government effectiveness	-0.053 (1.550)	-0.029 (0.610)	-0.056 (1.210)	-0.063* (1.710)	-0.054 (1.610)
ARA lagged 3 years*government effectiveness	0.100** (2.180)	0.003 (0.040)	0.112* (1.900)	0.109** (2.250)	0.088* (1.880)
Effectiveness of service delivery (SD_{it})	0.378*** (6.470)	0.340*** (3.580)	0.327*** (3.640)	0.375*** (5.690)	0.348*** (5.420)
Democratic accountability (DA_{it})	0.004 (1.510)	0.025*** (3.200)	0.007 (1.540)	0.003 (1.020)	0.003 (0.850)
Agriculture share in GDP ($Agric_{it}$)	-0.192*** (5.300)	-0.116 (1.230)	-0.173*** (2.960)	-0.183*** (4.630)	-0.216*** (5.630)
Foreign trade share in GDP ($Trade_{it}$)	0.192*** (3.870)	0.296*** (3.590)	0.252*** (3.480)	0.208*** (3.760)	0.180*** (3.500)
GDP per capita (GDP_{it})	-0.100*** (2.720)	0.034 (0.150)	-0.083 (1.370)	-0.105*** (2.720)	-0.127*** (3.160)
Inverse Mills ratio for VAT (IMR_{VAT})				0.006 (1.080)	
Inverse Mills ratio for ARA (IMR_{ARA})					0.135 (1.060)
Constant	2.759*** (7.320)	0.960 (0.490)	2.349*** (3.720)	2.703*** (6.590)	2.977*** (7.250)
Observations	294	294	294	288	288
R-squared	0.5172	0.4056	0.5408	0.5070	0.5156

The dependent variable is total tax revenues as a share of GDP, as described in Table 2.7. All fixed effects and random effects specifications include country and year fixed effects. All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

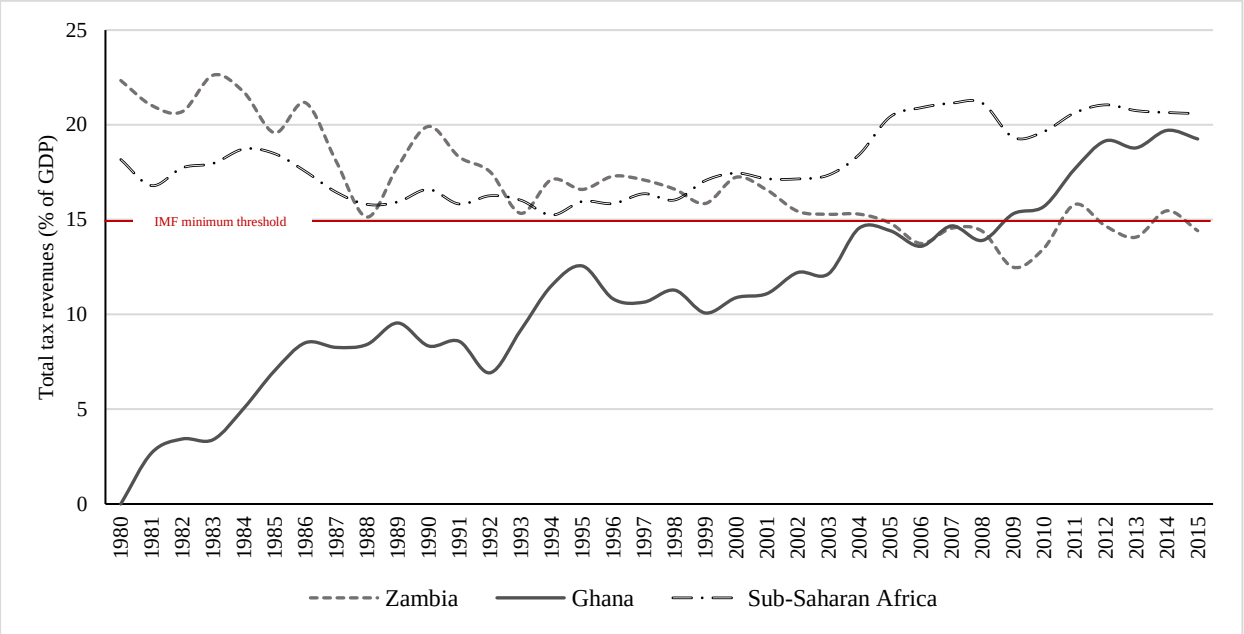
2.6. Qualitative results – Ghana and Zambia case studies

As mentioned earlier, our methodology is a 'qual-quant' approach. In the preceding section we have applied a quantitative approach as our main analytical approach. In this section we adopt a different approach, a qualitative analysis, as an attempt to trace some of the factors or processes that may underlie the development (or lack) of tax systems our findings through a comparative study of two countries: Ghana and Zambia. Ghana and Zambia both fall in the lower-middle income range (by World Bank classification), with average per capita incomes of about US$1,751 and US$1,523 during the 2010s; both are mineral-exporting economies; and in terms of democratisation, one of the key drivers of tax ratios according to our analysis, both have experienced a similar progression, with Ghana's military-authoritarian regime of the 1970s and Zambia's one-party state in the 1970s-1980s and dominant-party government of the 1990s having given way to multi-party democracy[17], and as can be observed in Figure 2.4, both have had almost the same democratic accountability score between the 1990s and 2014. Both countries, moreover, adopted the value added tax (became operational in 1995 in both countries) and established ARAs early in the reform process which followed the global crisis of the 1980s (operational in 1983 in Ghana and 1994 in Zambia). However, the evolution of the two countries' tax revenue performance has been very different, as shown by the trends in Figures 2.6a, 2.6b and 2.6c. Ghana's tax revenue performance between 1980 and 2014 improved from just under 5 percent to 20 percent, a process which Prichard described as 'the most dramatic, and prolonged, improvement of any country in Africa' (Prichard 2009: p.8). Ghana was worse off and lagged behind the average country in sub-Saharan Africa for much of the period between the 1980s and early 2000s, but its performance has been improving steadily during the same period and is now able to collect above the IMF's recommended tax revenue performance. Zambia's performance on the other hand, in spite of the favourable political environment, having implemented policy and institutional reforms promoted by multilateral development agencies, fell during the same period from 22 percent to 14.4 percent and appears, it will be recalled, as a 'negative outlier' on Figure 2.4 which plots the relationship between democratic accountability and fiscal performance. Zambia was one of the strong performers in sub-Saharan Africa in the 1980s, as will be recalled from Table 2.1, and stood more favourably in comparison to its peers like Ghana, and also above the IMF's recommended

[17] The Ghana part of this section updates but otherwise closely follows the narrative in Mosley (2017), but the Zambia data and analysis are our own.

threshold for minimum tax revenue performance. Zambia's performance has rapidly declined, particularly after the 1990s, and now lags behind Ghana's and the sub-continent's average. Our aim is to understand the reasons for the apparent difference in the evolution of tax revenue performance between these two countries.

Figure 2.6a: Trends in average tax performance in Ghana and Zambia (1980-2015)

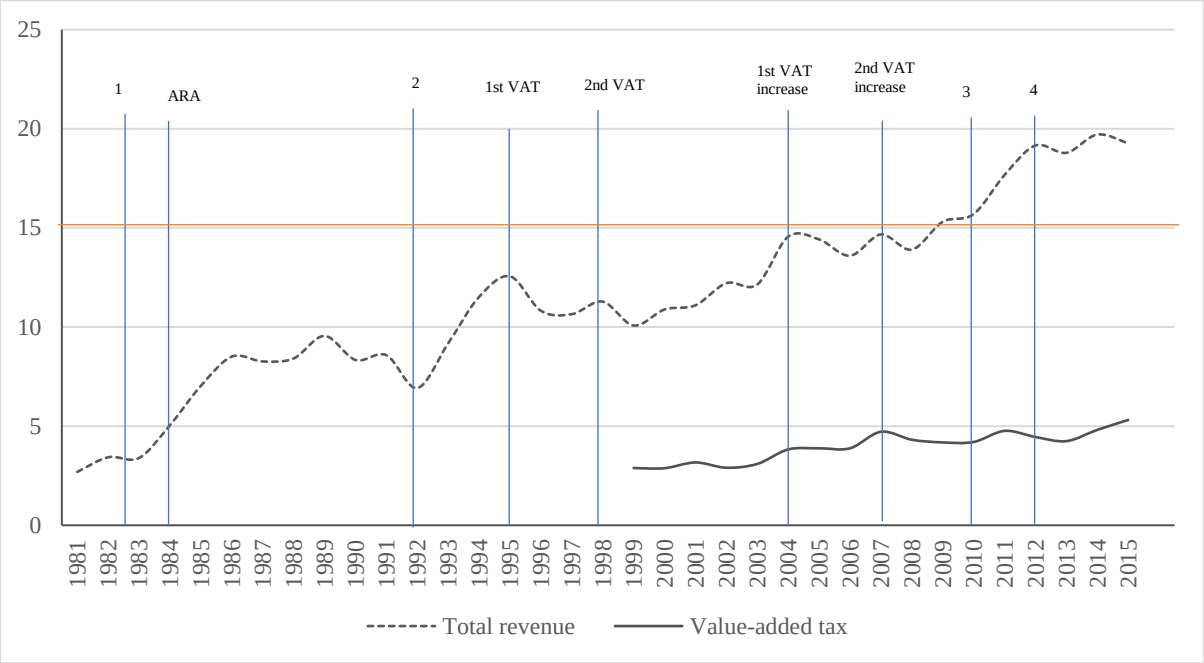


Source: UNU-WIDER (2018), IMF (2011).

Notes: The IMF recommended minimum threshold of 15 percent of GDP is based on the calculation for the required tax revenues for the provision of basic public goods and services.

We explore these issues in more detail to try and identify factors which may underlie Zambia's apparent inferior tax revenue performance relative to Ghana's. Our qualitative analysis focuses on the following possible causal factors: whereas both countries have adopted the VAT, Ghana seems to have done better in improving its contribution (as can be seen in Table 2.6b) while the contribution of the VAT to tax revenue has remained static in Zambia; Ghana, unlike Zambia, had a politically potent smallholder export sector. In Zambia, the political landscape is dominated by powerful mining companies and other multinational corporations, which in various ways contribute to government weak ability to effectively raise taxes. We shall argue these factors have contributed towards the evolution of '*fiscal contracts'* which emerged. Finally, unlike Zambia, Ghana achieved a close working relationship with the IMF and other key bilateral aid donors. These differences, we shall argue, fed directly into the evolution of the tax systems of the two countries.

Figure 2.6b Ghana: chronology of tax changes (1985-2015)



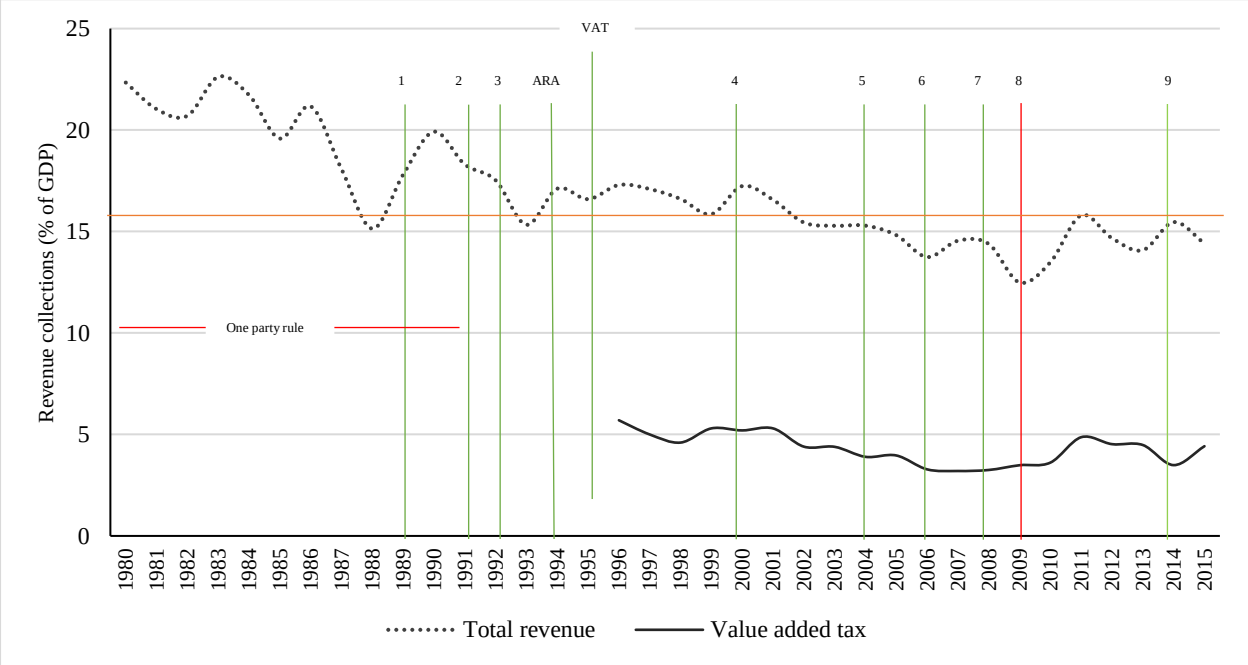
Source: UCTD/UNU (2018).

Notes: 1 – First structural adjustment credit agreed with the World Bank/IMF
ARA – Establishment of the National Revenue Secretariat
2 – Liberalisation of cocoa export prices; removal of implicit cocoa export tax
1st VAT – First (unsuccessful) introduction of the valued-added tax to replace sales tax; proposed VAT policy abandoned
2nd VAT – second (successful) introduction of the VAT at a lower rate than previous sales tax
1st VAT increase – Increase in VAT earmarked for National Health Insurance Scheme; mineral windfall tax also introduced
2nd VAT increase – Increase in VAT earmarked for National Health Insurance Scheme; mineral windfall tax also introduced
3 – Increase in mineral royalty rates
4 – Start of petroleum exports from Ghana; petroleum taxes begin to be paid; mineral windfall tax withdrawn

As can be noted from Figure 2.6 (b), Ghana first introduced the VAT (at a higher rate of 17.5 percent) to replace sales and service taxes (levied at 15 percent) in 1995 to diversify the tax base and improve tax revenues, simplify domestic tax policy and tax administration (Terpker, 1996; Addison and Osei, 2001). This policy reform was implemented under the stress of pressure by the IMF who were concerned about "high levels of indebtedness in the aftermath of huge expenditure increases during the 1992 election" (Prichard, 2009: p.12). However, this effort was largely unsuccessful because within three months the policy was abandoned following a public apprehension – characterised by widespread protests and large-scale non-compliance. Terpker points out that the lack of public education on the new tax was the main reason cited more than any other for the public apprehension over the VAT. The government of Ghana realised early on that it was necessary to achieve broad public consensus on the VAT and avert resentment towards tax increases. The VAT was later successfully reintroduced and publicly accepted (at a lower rate of 10 percent) in 1998 and following this reintroduction

Ghana has experienced a significant increase in both the VAT and total tax revenue collections, as can be observed from Figure 2.7 (b). VAT revenue collections increased from 2.9 percent of GDP in 1999 to 5.3 percent of GDP by 2015. An important factor in the improvement of the VAT performance in subsequent years is government ability to successfully increase the standard rate by linking such increases, backed by much publicity and sensitisation to secure political support, to the creation of the Education Trust Fund in 2000 and establishment and improvement of the universal National Health Insurance Scheme in 2004 and 2007, respectively.

Figure 2.6c. Zambia: Chronology of tax changes (1985-2015)



Source: UCTD/UNU (2018), Ministry of Finance (various budget speeches and economic reports), Zambia Revenue Authority (various annual reports)

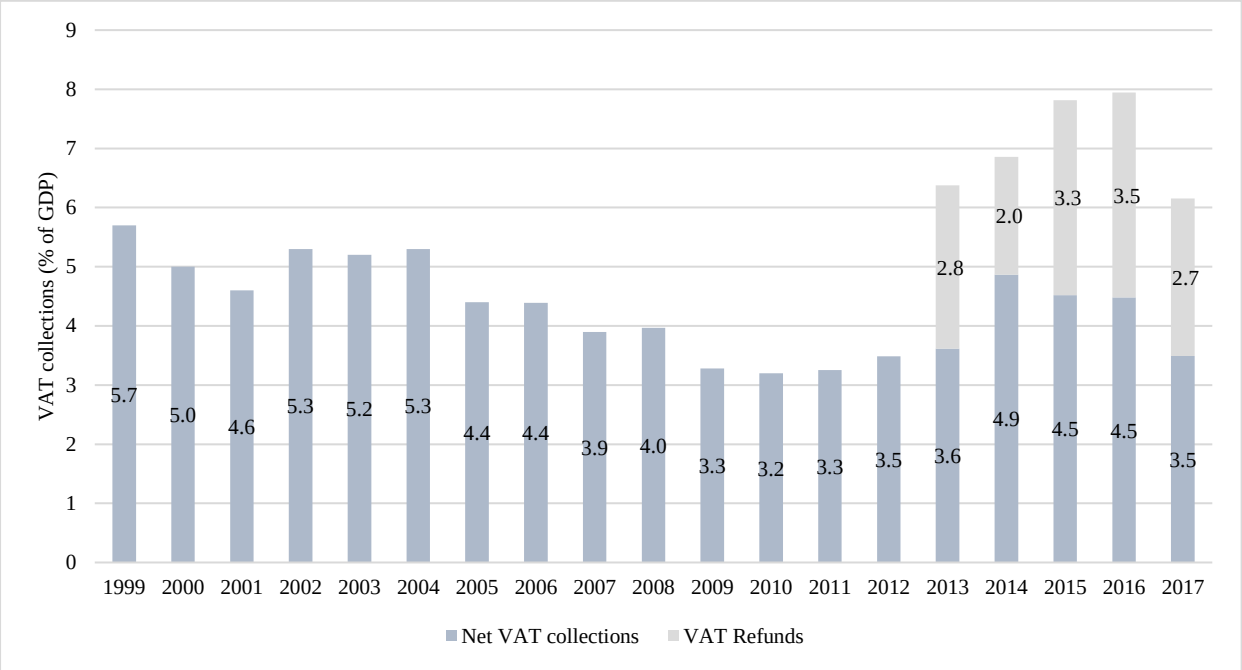
Notes: 1 – Government breaks relations with IMF and implements New Economic Recovery Programme
2 – Return to multiparty system and first multiparty elections (two-parties)
3 – Resumption of relations with IMF and major tax reforms pushed by the Fund
ARA – establishment and commencement of operation of Zambia Revenue Authority
VAT – implementation of the value added tax
4 – Privatisation of state-owned enterprises, including the country's mining conglomerate. Provision of generous tax concessions and exemptions to new mining companies
5 – First major changes to the VAT law (expansion of exempt items to reduce refund of input tax), an attempt to raise taxes
6 – Proposal to expand items to be subject to VAT Act (including newspapers, basic foodstuffs, books) rejected by the opposition and general public
7 – Copper windfall tax introduced, due to public discontent, and also on advice by Norad and the IMF
8 – Abolition of the copper windfall tax due to pressure from powerful mining companies and the fall in copper prices. Government caved into the demands of mining companies to assess windfall tax liabilities at 25%, instead of the tiers of 25%, 50% and 75%. Mining companies also only agreed to pay the assessed 25% over three years (2009-11).
9 – Increase in mineral royalty tax from 0.6% to 3%. Attempts to raise mineral royalty rates in 2013 and 2018 were met with a strong rejection by powerful mineral companies. The 2013 proposal to increase the royalty rates from 3% to 9% for deep-cast and 20% for open cast were unsuccessful after mining companies threatened to shut down mining operation and lay off workers.

Contrary to Ghana, in Zambia the VAT was successfully introduced at the first attempt in 1995 at a higher rate of 20 percent, but this did not immediately lead to any significant increase in tax revenue collections. As Figure 2.6c shows, it was adopted at the time tax revenues were declining and this continued in spite of the adoption of the VAT. Figure 2.6c also reveals (in the graph in the bottom part) that the performance of the VAT has weakened since its adoption, from about 5.7 percent of GDP in 1996, reaching the lowest level of about 3.2 percent in 2010, before slightly improving to 4.4 percent by 2015. According to our respondents in the Ministry of Finance and Zambia Revenue Authority, the weak (or low) performance of the VAT can be linked to several factors including weak government ability to galvanise and secure support of taxpayers and around tax issues but also government failure to resist political pressure for tax reductions from the urban populations and interest groups such as trade unions, non-governmental and faith-based organisations, due to a weak political base. Records in the Tax Policy Unit of the Ministry of Finance and our experience working there show that there had been a lot of pressure to reduce the standard rate or exempt most of the basic items such as food, health and education services from taxation. These records show that more than a third of the tax policy proposals submitted to the Tax Policy Review Committee of the Ministry by individuals, corporations and organisations for possible inclusion in the national budget were related to VAT-reduction. Government buckled under the weight of such demands and surrendered to this pressure by reducing the VAT standard rate was in 1997 from 20 to 17.5 percent. Another important episode which exemplifies this weakness is a botched attempt in 2006 to widen the VAT net by bringing more goods into the net (including newspapers, basic foodstuffs, books) which was rejected by the opposition and the general public through petitions to the President and the National Assembly. A key factor underlying the insurrection was that the tax was going to increase the cost of living and hurt many segments of the population. The proposal was withdrawn after the President directed the Minister of Finance to do so.

Political pressure to further reduce the VAT standard rate continued during the 2000s. In his budget address to the National Assembly in January, 2008 the Minister of Finance stated, after reducing the VAT standard rate from 17.5 percent to 16.0 percent that "the issue of the 17.5 percent standard rate of the VAT is a matter on which I have received numerous representations for many years. I have always promised that I will respond when economic conditions were appropriate" (GRZ, 2008: Budget Speech). However, the reason for the reduction was that "the burden of the VAT on low-income earners had been rising … hence

the reduction was intended to cushion this segment of the population". In our view, government inability to secure political support for the VAT and its weak political base which led to the reduction of the VAT rate from 20 percent to 17.5 percent in 1997, and to 16 percent in 2008, partly explains the fall in revenues.

Figure 2.7: Zambia - Total value-added tax collections and refunds, percent of GDP (2013-2017)



Source: Zambia Revenue Authority (2018). (GRD) ICTD/UNU-WIDER (2019),
Note: The 2017 figure is only preliminary, and has been reported by the IMF, the government has been delaying refunding input tax and using the funds as a source of short-term financing, thereby accumulating arrears which now stand at about US$800 million (IMF, 2017).

According the Zambia Revenue Authority, the other cause of the poor performance of the VAT in Zambia is a case of the VAT being more difficult to administer than initially thought and that these enforcement problems have been undermining its effectiveness, similar to what Jantscher (1987: p.3) observed in the case of "presumptive taxes". The Zambia Revenue Authority has stated publicly that: "[The] VAT has turned out to be a drain on national coffers since its introduction because of the complexities of the system as well as leakages in the refund system". Our analysis of the VAT tax returns shows that although gross VAT revenues increased in the last few years, net collections have declined due to the rapid increase in refunds. As example of this being the VAT performance during the years 2014-2016 as shown in Figure 2.7, when gross VAT collections increased from 6.9 to almost 8.0 percent of GDP, but its net contribution declined over the same period from 4.9 to 4.5 percent. Although gross VAT collections have been increasing over the years, they have not matched the increase

in refunds, thereby causing net VAT collection (revenue to government) to drop. The Zambia Revenue Authority argues that the cause of this problem is the complexity associated with the processes and documentation that is required. The government also seems to believe that this is the major cause of poor VAT performance, and now this issue has increasingly dominated tax policy debate in Zambia. Having buckled under the weight of paying huge VAT refunds for some time, the Minister of Finance has proposed to repeal the Value Added Tax Act and replace it with the new Sales Tax Act in 2019.

We also suggest that the divergence in the evolution of tax performance between Ghana and Zambia is largely due to two factors of great importance to the two countries' political economies: Ghana, unlike Zambia, had a politically potent smallholder export sector and Ghana, unlike Zambia, achieved a close working relationship with the IMF and other key aid donors. These differences, we shall argue, fed directly into the evolution of the fiscal contracts which emerged in the two countries. Ghana's exports of cocoa, and to a lesser extent other tropical export crops such as pineapple, have since early colonial times been the mainstay of the economy alongside gold and other minerals, by contrast with Zambia which since the 1920s has been wholly mineral-dependent. From 1930 until 1992, however, lacking a political leverage corresponding to their economic contribution[18], Ghanaian cocoa producers were subjected to an implicit tax, at a rate varying between 30 percent and 90 percent, consisting of the difference between the export price of cocoa and the price paid to cocoa farmers[19]. This 'cocoa industry development fund', as it was formally known, thus became a key element in Ghana's public revenue, which has no parallel in Zambia, where public revenue is and has always been composed less of commodity taxes and much more of taxes on sales and personal income[20].

Both economies were hit hard by the global depression of the 1980s, and by the consequent collapse of commodity prices and foreign investment. Ghana, however, was much the quicker of the two administrations to acknowledge its dependence on, and form contractual

[18] There is one exception to this tendency: between 1969 and 1972 Kofi Busia's National Liberation Congress, whose elite was dominated by representatives from Ashanti, the main cocoa-growing area, did win power and attempt to roll back the implicit cocoa export tax: but they were forced out of power by a military coup before they were able to make any progress with repealing export taxes.

[19] Data illustrating the gap between the on-farm price and the export realisation from the 1950s through the 1980s is provided by Bates (1981), appendix B.

[20] The ratio of commodity taxes to total tax revenue in Ghana is estimated at 30-35% in the 1980s, falling to between 15 and 20% by 2005-10; in Zambia, it is estimated at 25-30% in the 1980s, falling to just under 10% between 2005-10 (source: IMF, *International Financial Statistics*)

relationships (ESAFs) with, the aid donors: in particular, it had accepted by the mid- 1980s that priority that needed to be given to the restoration of foreign investment and liberalisation, whereas Zambia continued until almost the millennium to cling to the idea of state participation in strategic industries including mining[21]. Even more importantly, Ghana embraced with much more conviction than Zambia the pro-poor, redistributive rhetoric emanating from the international development agencies and embodied in the Multilateral, later Millennium, Development Goals and their associated apparatus of Enhanced Structural Adjustment Facilities (ESAFs), which eventually were transformed into Poverty Reduction Strategies, because it was ahead of the game in being able to foresee the political and fiscal advantages which might flow from broader-based development. This had the important effect of giving Ghana (by contrast with Zambia) ideas concerning not only which new taxes might yield additional tax revenue, but also how to frame those new taxes in the form of a 'fiscal contract' which would make taxpayers feel as if they were getting something in return for those increased tax payments (an important example being the VAT increase of September 2004, which was linked, backed by much publicity, to the creation of the universal National Health Insurance Scheme). Zambia never managed any 'contractual linkages' of this sort, with the exception of the very popular mining windfall tax, brought in in 2006 by an already ailing President Mwanawasa and rescinded in 2007, shortly after Mwanawasa's death, by his successor Rupiah Banda. Not only was the mining windfall tax rescinded, but from 2009 the multinational mining companies were able to negotiate, with the government's blessing, a tax regime in which only the most profitable opencast mines (Lumwana and Kansanshi) paid any corporate income tax, and the others, all deep mines, were exempted. The contrast with Ghana, where all large (multinational) mines paid corporate income tax and the richest, Newmont, paid a surcharge above this, is stark, and this alone accounts for much of the difference between the trend of the tax yields achieved by the two countries. We return to this subject in Chapter 4 below.

A crucial milestone in cementing the Ghana government's alliance with both cocoa producers and aid donors was the liberalisation of cocoa marketing in 1992. This reform

[21] In Ghana the ratio of aid to GNP was around 13% in the first half of the 1990s, rising to around 21% in the first half of the 2000s; in Zambia the ratio was around 10% in the first half of the 1990s, rising to 16% in the first half of the 2000s; in both countries, the aid-to-GNP ratio has fallen back into single figures since the beginning of the present decade under the impetus of economic growth. However, the key difference between the aid relationships of the two countries resides not in these numbers, but rather in the quality of the relationship (and in particular the poverty reduction commitment of the Ghana government), which made possible the exchange of ideas on tax reform (for example concerning 'linked taxation', user charges, and the taxation of the informal sector), on a scale which did not occur in Zambia.

removed the implicit export tax on cocoa, gave approximately half of it back to cocoa producers[22] and channelled the remaining half into programmes of subsidy and technical development programmes designed to increase the productivity and competitiveness of the cocoa industry. The impacts even of the half which was distributed to cocoa producers were very widely diffused, since cocoa is a labour-intensive crop grown by small as well as large farmers, and account for a substantial part of Ghana's achievement in halving poverty between 1990 and 2014, and substantially reducing inequality (by contrast, in Zambia, poverty scarcely changed over this twenty-five year period, and inequality has risen slightly)[23].

They were also important fiscally, because, by cutting taxes on a large and politically outspoken section of the population, in combination with the aid-led structural shift of public expenditure into health, education, agricultural extension and rural infrastructure (which raised the pro-poor expenditure ratio from around 5 percent to around 35 percent between 1990 and 2014[24] ; see Table 2.16) they provided the government of Ghana, as already mentioned, with an eloquent down payment towards the formation of an equitable fiscal contract. Both the shift towards pro-poor human capital expenditure and even the formal part of the fiscal contract, the earmarking of particular taxes to particular expenditure headings, were, for a period, emulated by the Zambia government also, but with less conviction, less effective publicity and less impact[25].

[22] The proportion of the export price received by Ghanaian cocoa growers rose to 58% in 1992, fell to around half in the mid-1990s and rose again to 60% during the early 2000s. See Mosley(2012) figure 5.2.

[23] In Ghana, headcount poverty across the country as a whole fell from 51% to 24% between 1990 and 2014, according to successive reports of the *Ghana Living Standards Surveys*, and the Gini coefficient of inequality has fallen from 45% to 33%. In Zambia, the national poverty headcount rate has been static at just over 60% from 1990 to the early 2000s (Data published in April 2016 by the Central Statistical Office suggest that national headcount poverty in 2015 may have fallen to 54%, but these data are apparently contradicted by rural poverty data from the Indaba Agricultural Policy Research Unit (IAPRI), see Mosley (2017), notes to table 4.4, page 118.) The Gini coefficient has risen slightly since 1990 from 61% to 64%, see Table 2.16 below.

[24] Although this figure is faithfully derived from issues of the IMF *Expenditure Statistics Yearbook* for the years named, we regard the figure as suspicious, almost certainly overstated, and probably derived from changes over time in classification of particular expenditure headings.

[25] Zambia increased the share of its public expenditure devoted to health and education from 24% to 34% between 1990 and 2014, by comparison with Ghana's increase of that percentage from 5% to 35% over the same period (see Table 2.16 below). Ghana, as described earlier, committed monies derived from increases in VAT in 2000 and 2003 to the Ghana Education Trust and the national health insurance scheme respectively; it also applied the same principle to a 'talk tax' on mobile phone calls, earmarked to expenditures for the reduction of youth unemployment. All of these measures can be seen as attempts to make the fiscal contract between taxpayers and government explicit. Zambia also attempted this kind of earmarking with respect to mineral taxation in 2008, when a windfall tax on copper was earmarked to be spent one-half on health and education in the poorer districts of Zambia, and one-half on local councils. This tax was however dropped in 2009, and in spite of governments that it was being reintroduced in 2011, there has been no sign of this being implemented.

However, the importance of smallholder exports (in Ghana, by the cocoa industry) goes beyond their fiscal role. Once liberalised, the Ghana cocoa industry was able to assert itself as a key player in political debate, and began to use its muscle to countervail the policies of 'urban bias' (i.e. cheap food and cheap inputs, in the interests of importers, especially multinational companies) which had afflicted Ghana, Zambia and most other African countries since colonial times. In particular, the previous pattern of a state dominated by rent-seekers, able to insist on cheap-input policies in return for the provision of support to the government, was replaced by a 'strategic alliance' in which both cocoa exporters and government jointly agreed, as the outcome of a bargaining process, that they have more to gain than to lose by the preservation of free-market policies in specific markets, including most particularly the preservation of a competitive real exchange rate, in defiance of the wish of importers and rent-seekers for a higher exchange rate and lower input prices. As Table 2.16 shows, the Ghanaian real exchange rate has depreciated steadily since the reforms of the 1990s, thereby boosting exports and their diversification[26], the growth rate and, eventually, tax revenue. By contrast, as may be seen in the same table, the Zambian real exchange rate has gone in the opposite direction, and hence growth and tax revenue have been correspondingly lower. Fundamentally, this is because the Zambian government is not confronted by any interlocutor as powerful as the Ghanaian cocoa producers' lobby to restrain it from policies of urban bias, and in particular from policies of pegging the exchange rate and other key prices. In the absence of such restraints, exchange controls have been reintroduced in Zambia (in 2013), accompanied by other policies in restraint of free trade, such as controls on the export of maize. An additional lesson which we learn from these case-studies is that political pressure to maintain urban bias, when surrendered to, generates upward pressures on the real exchange rate which damage competitiveness[27]; and if

[26] Zambia increased the share of its public expenditure devoted to health and education from 24% to 34% between 1990 and 2014, by comparison with Ghana's increase of that percentage from 5% to 35% over the same period (see Table 2.16 below). Ghana, as described earlier, committed monies derived from increases in VAT in 2000 and 2003 to the Ghana Education Trust and the national health insurance scheme respectively; it also applied the same principle to a 'talk tax' on mobile phone calls, earmarked to expenditures for the reduction of youth unemployment. All of these measures can be seen as attempts to make the fiscal contract between taxpayers and government explicit. Zambia also attempted this kind of earmarking with respect to mineral taxation in 2008, when a windfall tax on copper was earmarked to be spent one-half on health and education in the poorer districts of Zambia, and one-half on local councils. This tax was however dropped in 2009, and in spite of governments that it was being reintroduced in 2011, there has been no sign of this being implemented.

[27] Our argument concerning the determination of policy in Ghana is inspired by Kang (2002), who explains the economic success of South Korea in the last quarter of the twentieth century, by contrast with the Philippines, in terms of a politics in which business and government were equally matched, rather than government being overwhelmed by the pressure of rent-seekers, leading to the preservation of openness in key markets, especially the market for foreign exchange. In Zambia, by contrast with Ghana, there has never existed any interest group with the political muscle to force government to keep the real interest rate competitive in defiance of the pressures of rent-seekers, although signs are emerging that Chinese firms in the manufacturing and construction industries are beginning to exercise pressures of this sort: see Hinfelaar and Achberger (2015:12-13)

these pressures can be countervailed, as they have been in Ghana, that will impact on the growth and thus the tax-earning potential of the economy.

Our story so far, then (see Table 2.16), is that the superior tax performance of Ghana in relation to Zambia is partly owing to causes already discussed, including the trend towards providing a better quality of public expenditure as a down-payment towards a durable fiscal contract, but also due to more fundamental factors not so far incorporated in the model, in particular the bargaining relationship between government and private interests (especially exporters) and its implications for the real exchange rate and competitiveness. However, there are two elements in this story which need closer attention.

Table 2.16: Ghana and Zambia: trends in key indicators (1990-2014)

	Ghana	**Zambia**
Tax ratio, 1990-2016	11 → 19.2	21 → 16.2
Governance: **Democratic accountability, 1990 versus 2016:** **Polity score(p_democ)** **Narrative**	2 → 5 Multi-party democracy since 1992	2 → 4.5 Dominant party (Movement for multiparty democracy) 1991-2005; multiparty democracy since 2005)
Tax structure: **Revenue authorities**	Ghana National Revenue Secretariat became operational 1985, converted into Revenue Agencies Governing Board 1998	Zambia Revenue Authority became operational in 1994
Value added tax	First introduced in 1995 at 17.5% but was repealed after 3 months due to public outcry over sudden increase in prices. Successfully re-introduced in 1998 and managed to increase the rate in 2007 and 2011	Introduced in 1995 at 20%, reduced to 17.5% and 16% percent due to public pressure. Attempts to increase the value-added tax rate failed in 2007 and 2009
Tax exemptions	None, but two larger mining corporations (Newmont and Anglo Gold) pay lower rates of royalty	Multiple: Previously only two mining corporations (Kansanshi and Lumwana) used to pay but since 2014 a third company (Chibuluma) is paying

Public expenditure: **Pro-poor expenditure/ effectiveness of public spending, 1990 versus 2014:**	4.7 → 35.0	24.3 → 36.9 (2008) → 34.0 (2014)
Macro-economic environment:		
GDP per capita	1919.6 → 3833.8	2318.3 → 3628.2
Foreign trade /GDP ratio	42.7% → 81.0%	63.4% → 83.2%
Agriculture/GDP ratio	45.1% → 23.2%	20.6% → 9.6%
Average Real exchange rate (1990=100)*	186	79
Gini coefficient of income inequality	45 → 33	61 → 64

The first of these is the implementation of tax policies and their visibility, in particular towards the corporate sector. We shall focus on mining tax policies. In both Ghana and Zambia, governments have followed broadly similar policies of increases in the standard rates of corporation tax and royalty during the boom years (2003-08), accompanied by flirtations with windfall taxes, 'linked' as earlier described to specific items of public expenditure. These tax increases are integrally linked with the consolidation of democratic governance: when the Ashanti-dominated National Patriotic Party, the successor to Busia's National Democratic Council of the late 1960s, took over the government of Ghana in 2000 it immediately brought in a windfall profits tax on mining in order to shift the burden of taxation off the shoulders of rural businesses (and cocoa in particular) on to mining, and when the Zambian Movement for Multiparty Democracy (MMD) which previously had enjoyed dominant party status, started to experience serious competition from the rival Patriotic Front (PF), it too used a windfall profits tax in order to counteract the PF's increasingly powerful argument that the privileges of the multinational mining corporations needed to be restrained in favour of a fairer deal for the economically insecure (Cheeseman and Hinfelaar, 2009).

What is crucial, however, is that whereas in Ghana all companies paid corporate income tax (albeit with concessions for the largest producers, Newmont and Anglo Gold) in Zambia, only two mining companies, First Quantum (at Kansanshi) and Barrick Gold Mining (at Lumwana) ever paid income tax[28] . This fact has become widely known and has begun to infect the political debate. Not only has it impaired the ability of the Zambian government to motivate

[28] Lundstöl et al. (2013), pp24-31 and especially graph 4.4 on page 24.

compliance with the current fiscal contract, as in the Bolivian case previously discussed; it has also caused NORAD (the Norwegian international development authority), the donor agency most concerned with the mining industry, having failed to persuade the Zambian ministry of finance after much pressure to enforce credible mineral taxation policies, to withdraw from Zambia in mid-2015[29]. The consultants appointed to review Zambia's mineral policies had previously reported that 'the government revenue instruments for mining developed for Zambia…failed by a large margin to deliver what could be considered an effective 'benefit sharing' of revenues' (Lundstöl 2014:1). In other words, observed tax compliance especially in relation to high-profile taxpayers, and not only advertised tax rates and bases, are crucial for determining trust, and thence trusters' (i.e. taxpayers'), willingness to participate in fiscal contracts.

The other issue requiring further discussion is the role of regulatory bodies, i.e. ARAs such as the Zambia Revenue Authority (ZRA) and Revenue Authorities Governing Body (RAGB) in Ghana. Since the beginning of the structural adjustment process in the 1980s, it has been an axiom of reformers – and the IMF in particular – that the office responsible for revenue collection needs to be uncoupled from the national ministry of finance, and the apparatus of central government more generally, in order to prevent privileged taxpayers from making corrupt deals with central government staff which breach the tax code. ARAs have been the main focus for the reform efforts of aid agencies and IFIs, and independent revenue authorities have sprung up all over Africa and to a lesser degree Latin America, as discussed above. Ghana was very early in accepting this prompt from the international funding agencies: in 1983, in the early reform period before the advent of democracy, it established a semi-autonomous National Revenue Secretariat (NRS), including a new Minister of National Revenue, to oversee the newly formed IRS (Internal Revenue Service) and CEPS (Customs, Excise and Preventive Services), 'each of which were granted greater autonomy from the main civil service, including salary flexibility' (Prichard 2009: 19, drawing on Osei and Quartey 2005). In 1998, a Revenue Agencies Governing Board (RAGB) provided a mechanism for integrating the work of these authorities, which was eventually amalgamated into an over-arching Ghana Revenue Authority. Zambia eventually followed suit, establishing the Zambia Revenue Authority in 1994.

[29] *Zambia Weekly*, 15 June 2015.

2.7. Conclusions

The primary objective of this chapter was to explore one of the most urgent and intractable development problems facing the poorest countries of the world, factors that underlie poor tax revenue generation and what kind of policy and institutional reforms can be expected to encourage the construction of a suitable revenue base which can provide an impulse to development. We focussed on three issues: first, the revenue consequences of policy reform innovations encouraged by the international development community and widely implemented in many countries which have involved making improvements in the quality of tax structures by adopting broad-based taxes, in particular the VAT; second, the impact of ring-fencing the process of revenue collection by transferring tax administration from the direct control of the ministry of finance to an ARAs, again another important donor-supported institutional reform innovation aimed at mitigating against political risks associated with tax increases; and third, whether poor countries can improve their tax revenue generation ability by framing the process of revenue collection as part of a 'fiscal contract' in which the government commits to improve its accountability and the value for money which taxpayers get from public spending, rather than as a coercive process.

This investigation is motivated by the lack of consensus on the true impact of the adoption of the VAT and creation of autonomous revenue authority, while there is no systematic evidence concerning the process by which 'fiscal contracts' can be formed and what impact they have had. Taking into account country- and time-specific fixed effects our results from *OLS, fixed effects* and *random effects* regressions based on a panel data for 42 African countries during the period 1980-2013, could not confirm our prior expectation that African countries' tax revenues would be significantly increased by the adoption of the VAT and the creation of ARAs. The principal findings from these baseline explorations is that the adoption of the VAT and the creation of ARAs appear to be less successful towards their revenue objectives (although they may have been successful in improving and simplifying tax systems). On average we find no evidence that these policy reform innovations demonstrably provide any revenue advantage to countries in Africa that have implemented them over those that did not. However, the results when lags are employed indicate that the ARA has an immediate positive and significant impact, but this dissipates over the medium term.

In this study we have also attempted to construct and test a picture of the process by which a 'fiscal contract' can emerge and impact on the revenue generation capacity in fragile states, even where any increase in taxes is politically risky. Our starting point was Rousseau's idea that increased democratic accountability, in the form of a 'fiscal contract', will be good for effective tax collection and thence state-building. We then considered recent empirical findings, and argued that a 'fiscal contract' (much of it consisting of implicit understandings but some of it consisting of explicit covenants linking specific tax payments and public expenditures) will be most likely to emerge not only as a result of democratic participation and good bureaucratic practice within the tax system, but also if taxpayers trust the fiscal system as a whole, i.e., they feel that they are getting good value from government expenditures in exchange for their tax payments. These ideas go beyond the macro- economic, structural and even governance issues featured in the majority of empirical studies of tax yields, as summarised in Table 2.2 above. Our results show that, the two governance variables, democratic accountability and the value of service delivery provided by public expenditure emerge as significantly associated with the ability to build 'fiscal contracts' and generate tax revenues.

We continued the analysis to understand whether the lack of statistical significance of our policy reform variables could be explained by the possibility that their beneficial gains tend to take some time because reforms can be complex and may require some refinements before their beneficial gain materialise. Our exploration was also extended to consider whether the success of policy reform innovations depended on the institutional environment within which they were implemented. Finally, we stretched our investigations into the possibility that there could be an endogeneity issue of selection among our policy reform variables and revenue performance, in particular that decisions to adopt the VAT or create an autonomous revenue authority are not exogenous to tax revenues collections, and need to be separately modelled for and then incorporated into the tax revenue function. Our principal findings are that the VAT has not provided any revenue advantage for countries that adopted them in relation to countries that did not have the VAT, whether in the short or long term. We established that its effect is not influenced by the institutional environment. On the other hand, the creation of ARAs appears to improve tax revenues in the initial years of the reform, but then these positive effects disappear over the medium to long term. Our findings also suggest that the ARAs are more successful in countries with a good institutional environment.

Further insight was gained by examining in more detail two countries with opposite over-revenue tendencies over the same thirty-year period: Ghana and Zambia. This comparison enabled us to observe some of the causal factors underlying the apparent failure of the VAT and the processes by which effective fiscal contracts were built. The key causes of the lack of success of the VAT, which in our opinion are also relevant to other developing countries, relate to the difficulty in administration this tax-type contrary to what was initially expected. The VAT has complex information and system requirements which are difficult to meet in many poor countries and have thus created loopholes for under-declarations of goods supplied and multiple input tax claims on the same VAT certificates which was apparent in Zambia, unlike in Ghana. The design of the tax and the ability of the government to gain political acceptance of tax increases by taxpayers played a major role in the contribution of the VAT in Ghana in relation to Zambia.

Our analysis has also revealed possibilities for bona-fides which may consolidate '*fiscal contracts'*, including the focussing of public expenditure on the poorest and/or politically most sensitive groups (see the significant coefficient on SD (service delivery) in Table 2.11 and on public expenditure (pro-poor expenditure) in Table 2.16), and establishing a level playing field for tax liability which publicly brings the large and powerful into the tax net. Comparative analysis of which of these bona-fides provides the most effective incentive for raising tax yields at the lowest cost constitutes an important horizon for future research. Finally, it illustrated that if there is widely disseminated evidence that big players (in particular multi-national corporations) are not paying what they owe, that will act as a disincentive to all the other players seeing their tax liability as contractual. Other issues, however, remain unresolved, in particular the ability of ARAs to reduce corruption and increase tax yields.

There is now abundant evidence that several low-income countries (not only Ghana as illustrated by our case-study, but also Uganda, Tanzania, Rwanda; see Figure 2.6 above) have been able to break out of the low income – weak government - fragile state – low tax capacity – low income trap, and that the formation of a '*fiscal contract'*, often with the assistance of the IMF and aid donors, is therefore possible in poor as well as middle-income countries. However, it remains the case that low-income countries still, on average, have worse tax performance than lower-middle and middle- income countries, and this holds their entire development back. The particular aspect of this that we would like to raise in conclusion is that the formation of '*fiscal contracts'* is not a one-shot action, but a process, often long-drawn out in time and often

requiring experimentation and policy reversal (the case of Ghana's botched and excessive initial VAT increase in 1995 is relevant here). Moreover, it is a process requiring the slow building of trust, and this requires in turn the making of down payments or bona-fides which require risk-taking and financial sacrifices exceeding the capacity of the poorest developing-country administrations, -especially if they are also fragile, conflict-vulnerable states. To take a specific example, the crucial move made by Ghana in 1992, of liberalising its cocoa industry and reducing the implicit tax on cocoa, was important in presenting the Ghana government as a credible partner in a '*fiscal contract*' and politically enabling the raising of taxes elsewhere in the economy; but it was a move with considerable short-term financial costs (note the dip in Ghanaian public revenue after 1992 on figure 2.6(a) and (c) above) and this implies costs, and political risks, not necessarily affordable by a state with a weaker bureaucracy and less access to aid donors. The question what kind of 'down payments' towards a '*fiscal contract*' can feasibly be made by governments in this predicament represents, in our opinion, an important frontier for future research.

Appendix 2.1: VAT and ARAs in Africa

		VAT rate	VAT adoption [a]	Autonomous revenue authority[b]
1	Angola	no VAT		no ARA
2	Burundi	18%	2009	2010
3	Benin	18%	1991	no ARA
4	Burkina Faso	18%	1992	no ARA
5	Botswana	10%	2000	2005
6	Central African Republic	18%	2001	no ARA
7	Cote d'Ivoire	20%	1960	no ARA
8	Cameroon	19.25%	1999	no ARA
9	Congo, Dem. Rep.	16%	2012	no ARA
10	Congo, Rep.	18.9%	1997	no ARA
11	Comoros	no VAT		no ARA
12	Cabo Verde	15%	2004	no ARA
13	Ethiopia	15%	2003	2009
14	Gabon	18%	1995	no ARA
15	Ghana	12.5%	1999	1985
16	Guinea	18%	1996	no ARA
17	Gambia	15%	2013	2007
18	Guinea-Bissau	15%	2001	no ARA
19	Kenya	16%	1990	1996
20	Lesotho	14%	2003	2003
21	Madagascar	20%	1994	no ARA
22	Mali	18%	1991	no ARA
23	Mozambique	17%	1999	2007
24	Mauritania	14%	1995	no ARA
25	Mauritius	15%	1995	2005
26	Malawi	16.5%	2005	2000
27	Namibia	15%	2000	no ARA
28	Niger	17%	1986	no ARA
29	Nigeria	5%	1994	no ARA
30	Rwanda	18%	2013	1998
31	Sudan	10%	2000	no ARA
32	Senegal	18%	1961	no ARA
33	Sierra Leone	no VAT		2003
34	Eswatini	14%	2001	2011
35	Seychelles	15%	2013	no ARA
36	Chad	18%	2000	no ARA
37	Togo	18%	1995	2014
38	Tanzania	20%	1998	1996
39	Uganda	17%	1996	1992
40	South Africa	14%	1991	1998
41	Zambia	17.5%	1995	1994
42	Zimbabwe	15%	2003	2002

Source: Ebrill *et al.* (2002), Crowe (2016),

Notes: [a] and [b] refer to the year when the value-added tax was actually implemented and when the ARA became operational (operational presence), respectively

Appendix 2.2. Regression results for VAT and ARAs only

Estimation method **Explanatory variables**	**OLS** **(1)**	**FE** **(2)**	**RE** **(3)**
Adoption of the value-added tax (VAT_{it})	-0.066 (1.180)	0.045 (0.820)	0.042 (0.760)
Value-added tax lagged 3 years(VAT_{it-3})	0.006 (0.070)	-0.020 (0.300)	-0.020 (0.290)
Value-added tax lagged 5 years (VAT_{it-5})	0.134* (1.690)	0.073 (0.750)	0.073 (0.750)
Creation of autonomous revenue authority (ARA_{it})	0.198* (1.960)	0.152** (2.580)	0.151*** (2.740)
Autonomous revenue authority lagged 3 years (ARA_{it-3})	-0.185 (1.440)	-0.145** (2.200)	-0.149** (2.290)
Autonomous revenue authority lagged 5 years (ARA_{it-5})	-0.085 (0.960)	0.034 (0.640)	0.030 (0.570)
Constant	2.972*** (92.880)	2.557*** (14.060)	2.533*** (12.460)
Observations R-squared	908 0.0139	908 0.1704	908 0.0412

All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

Chapter 3

Public expenditure on education, human capital and economic growth in developing countries

3.1 Introduction

In this chapter, which is the second core chapter of this thesis, we shift our focus from the revenue dimension covered in Chapter 2, to the expenditure aspect of fiscal policy and African development. The research problem we wish to tackle is whether investment in human capital, including public expenditure on education, is effective in fostering economic growth since it has been given a pride of place in the theoretical literature. The literature defines human capital quite broadly and includes abilities, knowledge, skills, experience and competencies a person possesses, which are assumed to be acquired through such processes as education, health, migration, research and development. Although the theoretical literature regards these as essential elements in the accumulation of human capital, we focus on investment in education, especially public expenditure on education, because it is education rather than other forms of human capital which has been credited to generate technological change and thence growth, especially in developing countries[30] (World Bank, 1986; 1995; Benos and Zotou, 2014). Of all the different forms of human capital, education is certainly the most central in the development literature and has been a dominant element of policy strategies in many developing countries and is the one on which we focus in this thesis.

Theoretical work on the relationship between human capital and economic growth has historically been dominated by two main competing theories – 'neoclassical theory' and 'endogenous growth theory'. The former argues that human capital only leads to temporary (short-term) increases in national output but does not lead to long-run growth because growth is driven by technological progress which is determined by exogenous factors. The latter asserts

[30]Also we focus on the education dimension here because this has been the major focus of development policies of poor countries but the evidence on education as a driver of growth remains more controversial than the evidence on health impacts (Harbison and Hanushek 1992; Hanushek 1995; Filmer and Pritchett 1999; Wolf 2004; Awaworyi *et al*.,2015)

that human capital is a key factor input which can invert new ideas or products and utilise existing innovations in order to drive technological progress and therefore growth. 'Endogenous growth theory' converts the temporary effects of human capital implied by 'neoclassical growth theory' into permanent effects on growth. The 'endogenous growth' framework, which is typically attributed to the work of the 2018 *Nobel Prize* winner, Paul Romer (1986; 1989), has attracted a lot of attention and several studies have now identified various ways in which policies and institutions affect human capital and economic growth (Landau, 1983; Lucas, 1988; Romer, 1989; Barro, 1991; Mankiw *et al*., 1992).

The importance of investments in human capital, especially education, has also been recognised by development agencies and for several decades the World Bank has encouraged developing countries to invest in education because it is considered as "economically and socially productive" (World Bank, 1986: p.1). Recent development discourse has encouraged developing countries to invest in human capital so as to create a basis for rapid and sustained which plays a major role in the fight against poverty and inequality (Perotti, 1996; Ravallion and Chen, 1997; Moser and Ichida, 2001). The United Nations claims that strong economic growth rates have been at the centre of halving extreme poverty rates in developing countries between 1990 and the present (UN, 2015). The role of public expenditure on education in development has also earned a dominant role in development and academic circles, because expansion of human capital depends on fiscal resources. Thus, the link between human capital and economic growth has been of utmost interest in development economics and the international development community.

For some while, investment in human capital attributable to education has been a key element of development strategies, on the advice of the World Bank (World Bank, 1991). The World Bank has specifically tended to stress policies which prioritise primary education in preference to secondary and tertiary education on the conventional wisdom that primary education is the most profitable (as well as the most equitable) form of educational investment and that "returns are by far the highest in the poorest countries" (World Bank, 1986: p.8). The prominence of this policy initiative has been reflected not just in spending patterns, as many countries are "increasingly willing" to allocate more resources to education, but also in the "remarkable scope and speed" in expansion of school enrolments across low- and middle-income countries in recent decades (World Bank, 2018: p.58, 185). Current data shows that public spending on education has become a major part of budgetary policies absorbing the

largest single share of national budgets in most developing countries. The research question we wish to tackle here is whether development policies which have emphasised investments in education-related human capital, including the increase in public expenditure on education, have been effective towards the growth objective as asserted by 'endogenous growth theory' and advised by development agencies including the World Bank.

The empirical evidence from macro studies on the link between investments in human capital, public spending on education and economic growth remains controversial, as we observe later, whether education expenditure or overall human capital indicators are considered as the independent variable, there are as many studies reporting statistically significant as those establishing insignificant or negative results. As can be observed from Table 3.3, there is no consistent story from current macro studies on this relationship, and thus, there are limited key lessons for policymakers in developing countries. What is particularly disturbing is that studies that have properly analysed the robustness of the findings are sceptical in tone, suggesting that the original 'endogenous growth' hypothesis has severe difficulties defending its claims. This scepticism has also be expressed in the 2018 *World Development Report*, in which the World Bank concedes that educational policies of the past five decades which gave priority to the expansion of school enrolments have led to a 'learning crisis' and have not produced the expected outcomes in low-income countries (World Bank, 2018: p.57). The only solid conclusion which we are able to derive from this evidence is that none of the three measures of human capital proposed as an explanatory story to explain differences in growth rates across countries is robust or even markedly better or worse than any of the others. All are seriously imperfect.

In attempting to contribute to our understanding of why the theoretically appealing and seemingly straightforward proposition, that investments in education can encourage the development of 'competences, skills and abilities' and therefore promote economic growth, has been difficult to defend empirically, we wrestle with three possible explanations. First, we explore the possibility that although aggregate measures of public expenditure on education may not emerge as significant correlates with growth, it is possible that some of its categories may differentially affect growth as suggested by the World Bank and others. In this study our focus is on public rather than total expenditure in education because education in low-income countries is "predominantly provided and financed by the government" due to market failures (World Bank, 1986: p.6). In relation to this, we study the impact of public expenditure on

education disaggregated into primary, secondary and tertiary levels. Although development agencies such as the World Bank have previously stressed differential investment in education favouring the primary level, no serious empirical work has been conducted to assess this World Bank conventional wisdom, in spite of such information being key in the budgetary process in terms of allocations.

Second, to improve our understanding of the link between public expenditure on education and growth, especially why this type of expenditure often does not lead to the expected improvements in economic growth, we examine whether the institutional environment in which policies are designed and implemented matters in determining its effectiveness, since it has been argued that good economic policies do not always produce good outcomes, as their success may depend on non-economic factors (North, 1991; World Bank, 2003; Acemoglu *et al*., 2008; IMF, 2015). The idea we wish to explore is that merely increasing public spending towards the education sector (as has happened in developing countries over the past decades) may not automatically translate into desirable outcomes if domestic institutions – involved in policy formulation and implementation – are weak or poorly functioning. Our other contribution in relation to this is that we adopt a different approach, a qualitative analysis of a case study involving Zambia, to try and trace some of the key non-economic causal factors which may underlie the lack of impact of public spending on education on long run economic growth.

Finally, we seek to explore the apparent paradox in the literature on education, which is that although investment in education has been found to have high private returns for individuals (higher earnings), policies which have stressed expansion of schooling have not been successful, across the board, towards improving economic outcomes. To address this problem, we turn to an issue which has recently drawn the attention of the development community, but to our knowledge not thoroughly explored on a cross-section basis, which is that common measures of education are seriously imperfect and that incorporating the 'quality' dimension in the analysis may be crucial. Again, this issue is well-recognised in the 2018 *World Development Report*, in which the World Bank observes that the massive expansion of schooling (quantity) has not resulted in improvements in learning for millions of students in low-income countries (World Bank, 2018). We investigate the possibility, suggested by van der Berg (2007) for South Africa, that while national educational policies may well have been successful in increasing the *quantity* of education all over Africa, thereby achieving goals of

universal primary education, they may have resulted in the stagnation or even falling of education *quality*, and thus exerted a drag on growth. Resolving this paradox may help developing countries improve the impact of education policies on growth, a necessary tool in the fight against poverty.

These ideas are explored using an empirical approach that specifies and estimates a dynamic growth model which captures the essence of the 'endogenous growth' framework on a sample of 42 African countries covering the period 1980-2014. Our dynamic growth model is estimated using a robust *OLS*, the *feasible generalised least squares* (to make our findings comparable) and an instrumental variable *two-stage least squares* estimators (2SLS) to minimise the effects of any potential endogeneity due to simultaneities and reverse causality. As mentioned earlier, these findings are combined with those from a country case study to highlight some of the causal processes which may not clearly show in the econometric findings.

The rest of the chapter is organised as follows. Section 3.2 provides an overview of the trends in human capital, public expenditure on education and growth. Section 3.3 outlines the theoretical and empirical literature on human capital attributable to education. Within this section, we highlight the gaps and important areas of our innovations. In section 3.4, we propose and discuss the empirical approach including the estimation model, data and estimation techniques. The quantitative and qualitative empirical findings are presented and discussed in sections 3.5 and 3.6, respectively. Conclusions and policy recommendations are provided in section 3.7.

3.2 Variations in education human capital investments and growth patterns

Global comparisons of public investments in human capital over the past three decades, in particular public spending on education and school enrolment patterns, reveal striking parallels and disparities across countries. Aggregate trends indicate that most countries have devoted an increasing share of fiscal resources to the education sector, absorbing the largest single share of national budgets averaging about 15 percent across low- and middle-income countries (World Bank, 2018). These trends, as shown in Table 3.1, indicate government increasing willingness to invest in education across income groups. The largest increase between the 1990s and 2010s was in low-income countries where public spending on education (as a percentage of GDP) increased by an average of 0.23 percentage points every decade (from

3.1 to 3.8 percent of GDP). Spending increased by an average of 0.13 and 0.07 percentage points per decade over the same period in high- and middle-income countries respectively. These patterns also indicate that investments in education remains lower in low-income countries than other income groups, perhaps signalling that there is scope for additional investments in human capital to achieve development. However, the dilemma facing policymakers in low-income countries is whether allocating more fiscal resources towards the education sector will guarantee improved development outcomes.

The data also reveals governments in low-income countries have made concerted effort towards expansion of education as part of the development strategy. Comparing school enrolment rates across income groups, there has been a remarkable increase in primary school enrolments particularly in low-income countries, almost closing up enrolment gaps with middle- and high-income countries in recent decades. The proportion of pupils enrolled at primary level almost doubled between 1980 and 2017 – from 67 to 101 percent[31]. On average low-income countries which were lagging behind other income groups in the 1980s and 1990s, are presently enrolling pupils almost at the same rate as the average middle- and high-income countries. Although concerted efforts have been made in improving secondary school enrolment rates over the same period, glaring gaps still remain, whereas there has been almost no tangible progress at tertiary level.

Table 3.1. Trends in education spending, school enrolments and growth rates

Variable	Group	1980s	1990s	2000s	2010s
Public education spending (as % of GDP)	High income		4.8	4.9	5.2
	Middle income		4.1	3.9	4.3
	Low income		3.1	3.5	3.8
Primary school enrolments	High income	101	102	102	102
	Middle income	102	102	104	105
	Low income	67	68	90	101
Secondary school enrolments	High income	89	96	100	105
	Middle income	43	52	62	76
	Low income	23	23	31	41
Tertiary school enrolments	High income	36	49	65	76
	Middle income	8	10	19	31
	Low income	5	4	5	9
Per capita GDP growth rate	High income	2.2	1.9	1.0	1.4

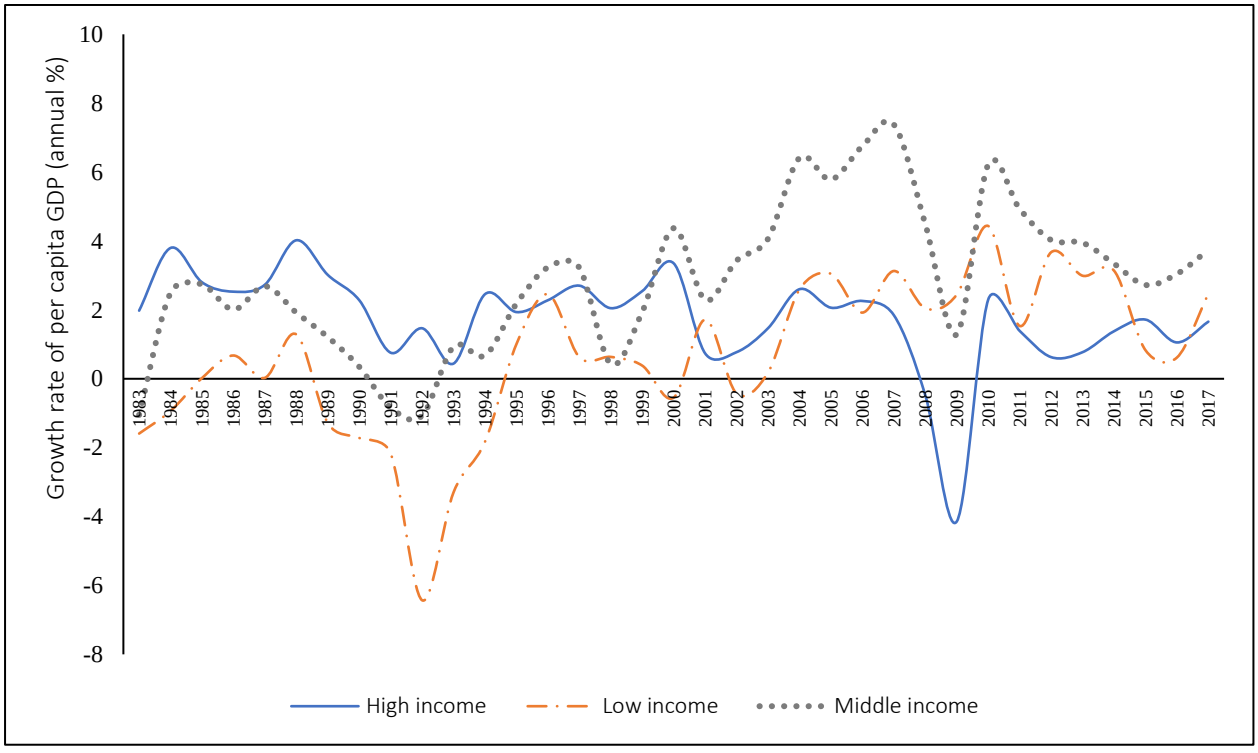
[31] Note that increases in school enrolments beyond 100% will not necessarily lead to any welfare improvement because such increases are bound to lead to a deterioration in schooling conditions and an increase in repeater rates. We estimate the negative impact of this later on in the chapter.

	Middle income	1.5	1.1	4.6	4.0
	Low income	-0.3	-1.0	1.6	2.4

Source: World Bank, *World Development Indicators* (2018)

Data on per capita growth rates over the past three decades, 1983 to 2017, shown in the lower section of Table 3.1, reveals that after experiencing some of the slowest growth rates of per capita GDP during the decades of the 1980s and 1990s, both low- and middle-income countries have achieved some of the impressive growth rates since the 2000s. From Figure 3.1, which plots the trends in the annual growth rate of per capita GDP over the past decades, it can be observed that economic growth rates improved generally between the mid-1990s and 2010 in low- and middle-income countries, albeit experiencing significant fluctuations during this period. Growth was relatively stable in high-income countries until the global crisis in 2008-9.

Figure 3.1: Annual growth rates of per capita GDP by income-groups (1983-2017)



Source: World Bank, *World Development Indicators* (2018)

Turning to Africa, the continent of our focus in this study, we observe close parallels in the overall trends in education spending, school enrolment rates and economic growth rates. Trends in public spending on education in Africa reveal that education has increasingly become a critical focus of investment and budgetary policies. Over the past three decades, from 1983 to 2017, African countries have spent on average 4.2 percent of GDP on education, which is

slightly above the 3.5 percent which low-income countries as a group spent during the same period (see Tables 3.1 and 3.2). Over the same period, Africa has also made significant achievements in school enrolments, with primary enrolments averaging about 89.2 percent compared to the average of 81.5 percent for low-income group of countries; secondary enrolment rates averaged 32.4 percent in comparison to 29.5 percent; and at tertiary it was lower at 4.9 percent relative to the 5.8 percent for the group low-income countries.

However, there are significant disparities among African countries. Education spending during the period 1983 and 2017 ranged between 1.6 percent in the Democratic Republic of Congo and 10.8 percent in Zimbabwe. There are also significant variations in school enrolment rates with primary enrolments ranging between 40.3 percent in Niger and percent 143.5 in Gabon; variations in enrolment rates at secondary level fluctuated from 8.0 percent in Tanzania to 88.9 percent in Seychelles; and at tertiary level enrolment rates varied between 0.5 percent in Malawi and 15.3 percent in South Africa.

Table 3.2: GDP per capita, education spending and school enrolments in Africa

	Country	GDP per capita (%)	Education spending (% of GDP)	Primary enrolments (%)	Secondary enrolments (%)	Tertiary enrolments (%)
1	Angola	0.6	3.6	91.2	14.4	2.9
2	Burundi	-0.7	4.5	80.7	15.6	2.1
3	Benin	1.1	3.7	87.4	29.8	5.7
4	Burkina Faso	2.1	3.4	50.2	13.8	2.0
5	Botswana	4.0	6.8	103.8	53.5	9.9
6	Central Afr. Rep.	-1.1	1.7	73.7	13.6	1.6
7	Cote d'Ivoire	-0.9	4.5	75.0	28.6	5.5
8	Cameroon	0.3	2.9	100.7	31.8	6.9
9	Congo, DR.	-1.7	1.6	89.4	31.8	3.4
10	Congo, Rep.	0.9	4.2	112.8	55.6	5.6
11	Comoros	0.0	4.8	105.2	40.5	4.2
12	Cabo Verde	4.7	5.8	112.1	58.2	12.8
13	Ethiopia	2.7	3.8	56.2	20.6	2.2
14	Gabon	-0.5	3.1	143.5	39.7	6.0
15	Ghana	1.8	5.1	86.1	45.1	8.4
16	Guinea	1.3	2.2	58.3	20.6	4.2
17	Gambia, The	0.0	2.5	75.5	23.8	2.1
18	Guinea-Bissau	0.4	2.6	68.4	12.6	1.8
19	Kenya	0.8	5.8	103.1	41.3	3.2
20	Lesotho	2.2	9.7	109.4	34.6	3.1
21	Madagascar	-1.0	2.9	118.6	29.3	3.3
22	Mali	1.4	3.3	52.5	19.9	2.5
23	Mozambique	3.0	4.3	86.3	14.1	2.3
24	Mauritania	0.4	2.9	72.1	19.6	3.7
25	Mauritius	3.8	3.9	104.7	72.7	15.1
26	Malawi	0.5	4.2	108.3	25.5	0.5

27	Namibia	0.8	6.4	116.5	53.2	9.1
28	Niger	-0.7	3.7	40.3	9.8	1.1
29	Rwanda	2.5	4.1	108.4	21.0	3.3
30	Sudan	2.4	1.7	69.0	40.3	13.0
31	Senegal	0.6	5.1	66.4	23.3	6.0
32	Sierra Leone	0.2	3.1	72.9	25.6	1.4
33	Eswatini	2.7	5.8	98.9	50.6	4.5
34	Seychelles	2.2	6.6	104.5	88.9	10.5
35	Chad	2.0	2.3	65.4	14.8	1.3
36	Togo	0.3	4.4	108.8	30.7	5.2
37	Tanzania	2.1	3.4	82.7	8.0	1.0
38	Uganda	2.3	2.9	94.7	10.8	2.2
39	South Africa	0.5	5.5	99.4	87.1	15.3
40	Zambia	0.7	2.8	96.0	18.4	2.2
41	Zimbabwe	0.1	10.8	108.6	39.7	4.2

Source: World Bank, *World Development Indicators* (2018)
Notes: Data on all variables are averages for the period 1980 to 2017 (or for any period for which data was available between 1980 and 2017).

According to 'endogenous growth theory', development strategies which have emphasised investments in education, and have led to increased public spending on education and massive expansion in school enrolments in low-income countries should have generated higher rates of economic growth. However, it is not completely clear from the trends and variations based on indicators of human capital presented in this section that countries that have made more investments have achieved higher growth. Given the significant investments made in education during the past decades and the recognition in development circles that investing in additional human capital will be crucial in achieving higher growth rates required to reduce poverty, one can certainly be led to question whether previous policy strategies have been successful towards their development objectives in developing countries.

3.3 Previous studies – survey of the literature

As mentioned earlier, our objective is to improve our understanding of the link between investment in human capital, especially public spending on education, and to identify factors which may explain the surprising finding that most of the common measures of human capital, including educational spending, often do not emerge as strong correlates with growth. Also, the goal is to try and find any clues as to what could be going wrong in this relationship.

Theories of economic growth have operated within a simple framework of growth as being determined by the stock of physical capital, labour and technological change. The

primary concern for researchers and policymakers is the source of technological progress or productivity growth. The theoretical literature on the source of technological change, and therefore long run growth, has evolved along two influential frameworks: the 'neoclassical' and 'endogenous' theories of growth. The simplest neoclassical model of growth is the Solow (1956) model in which output growth (Y) is determined by combining physical capital (K) with labour or the workforce (L) and the effectiveness of labour (E). Technology is assumed to enhance the effectiveness of labour. A basic 'neoclassical growth model', linking output, capital, labour and the productivity of labour is typically specified as a production function of the following form:

$$Y = F(K, L, E) \qquad (3.1)$$

According to the 'neoclassical theory' of economic growth, the growth of the economy is determined by the accumulation of productive capital, and how the labour force utilises that capital, but that this growth is temporary due to diminishing returns to capital. These models claim that capital accumulation leads to short-run increases which move the economy from one steady state to the next (level effects) and once the new steady state is reached, technological progress is the only source of permanent growth in output per capita. Technological progress as a key growth determinant in these models is assumed to be exogenously determined, but what drives it is not explained by the model.

'Endogenous growth theory' is built on the idea that technological changes are the primary drivers of economic growth but diverges from neoclassical models in explaining the source of technological progress. It is widely acknowledged that Romer's (1986) work, in which the central idea was that new knowledge and skills lead to innovation and technological changes, marked the genesis of 'endogenous growth theory'. Romer (1986) asserts that technological progress, which is a key driver of long run growth, does not happen randomly but is a by-product of deliberate policy decisions such as investment in human capital. The *AK* model is perhaps the simplest version of 'endogenous growth models' and is considered as "foundational" as subsequent models in this literature have been "derived" from it (Sala-i-Martin, 1990: p.4). In the *AK* model it is assumed that human capital accumulation and learning generate technological change and thence growth over time. The basic *AK* model takes the following functional form:

$$Y = AF(K, L) = AK \qquad (3.2)$$

In this model, the independent variable K, is defined more broadly to include the accumulation of productive physical as well as human capital, knowledge and other forms of capital such as stocks and access to finance. The parameter A represents the marginal product of, or return to investment in, capital. Equation (3.2) assumes constant returns to returns to capital, in contrast with the diminishing returns assumed by neoclassical models. The parameter A is assumed to endogenous to the expansion of knowledge, through such things like improvements in education, health, migration and can be affected by several factors including government policies, investment decisions and the institutional environment (Romer, 1986; Sala-i-Martin, 1990). Since the birth of 'endogenous growth theory' there has been a lot of interest in verifying empirically its claims that human capital accumulation is key to growth, and there is a large number of studies which has produced several models linking different indicators of human capital with the country's long-run growth rate. A standard empirical framework typically utilised in this literature is of the following form:

$$Y = Af(K, L, H) \equiv A(H)F(K, L, H, P, I) \qquad (3.3)$$

where H is an indicator of human capital (the product of its quantity and quality) and P and I indicators of the quality of policies and institutions, respectively. Thus, human capital, on this view, has double leverage on economic growth – operating both through its direct impact on output and through its indirect impact on technical change. Therefore, these models argue that human capital is the key input which underlies technological progress and "policies targeted at human capital accumulation can have distinctive effects on long-run growth" (Barro, 1991: p.409).

The theoretical literature emphasises different mechanisms through which investment in human capital attributable to education affects economic growth increases the productivity of the labour force, the "innovative capacity of the economy, knowledge of new technologies, products and process" (Benos and Zotou, 2014: p.669). The empirical literature, summarised in Table 3.3, shows that there is a large number of studies that has examined the link between investment in education and growth, largely comprising cross-sectional and panel-data regression studies, with some of them focussing on school enrolment rates and average years

of schooling as indicators of human capital. There are also studies aiming to examine the effect of aggregate measures such as public spending on education. Table 3.3 brings together key findings from studies on educational spending, human capital and economic growth which we have reviewed in this chapter. They are divided according to those that report positive (on the left-hand side of the Table) and those that report negative or insignificant results (on the right-hand side). We provided in Appendix 3.1, a more detailed compilation of findings the findings covering more studies.

Our review of the empirical literature which focuses on the common measures of the education-linked human capital – public spending on education, enrolment rates and average years of schooling – shows that the evidence is limited: most of these indicators do not emerge as strong correlates with growth. Some of the early regression exercises which begun in the late 1980s with the analysis of initial levels of school enrolment and literacy rates as measures of education human capital establish a statistically significant positive association (Romer, 1989; Barro, 1991; Mankiw *et al*., 1992). For example, using the literacy rate as a proxying for education human capital, Romer (1989) and Azariadis and Drazen (1990) find that a positive link with GDP per capita. Barro (1991) employs initial primary and secondary school enrolments and shows that human capital has a significantly positive impact on the growth rate of per capita GDP. Mankiw *et al*. (1992) approximating human capital by a product of secondary school enrolment rates and the population of secondary school age, report a positive impact of the schooling variable on growth. These studies, which the literature considers as the most influential early papers, conclude that increased schooling can have salutary effects on the growth rate of the economy. Using secondary school enrolment rates, Barro and Lee (1994) find a positive effect of human capital on growth. Barro and Sala-i-Martin (2004) report evidence that male secondary schooling has a statistically significant positive effect on growth, but female secondary schooling has an insignificant impact. Several other studies corroborate this finding (see for example, Sala-i-Martin (1995, 1997), Temple (1999), Krueger and Lindahl (2000), Bassanini and Scarpetta (2001) and Baldacci *et al*. (2004)). However, within the same literature that employs schooling as a measure of education human capital, several other studies find no (or weak) association as estimates of human capital variables emerge as insignificant or even negative. The Lau *et al*. (1991) study disaggregated the impact of education by region and finds a negative impact of primary educational attainment in Africa and the Middle East, a significantly positive effect in East Asia, but an insignificant one in Latin America and South Asia. Benhabib and Spiegel (1994) estimate a statistically significant and robust negative

coefficient on the average number of years of schooling and literacy rates. In his article "Where has all the education gone?" Pritchett (1996) finds a statistically significant negative effect of one of the conventional measures of education - average years of schooling of the labour force – on growth rate of per capita GDP. In a meta-regression analysis of the findings of 57 studies on education and growth, Benos and Zotou (2014: p.670) conclude that "there is no homogenous genuine effect of human capital across studies".

Within this vast literature, there are also studies specifically focussing on the role of public spending on education as a key driver of economic growth. As shown in Table 3.3 below, the picture that emerges from studies that are based on aggregate measures of public education spending[32] matches the findings from studies based on schooling discussed earlier – there are as many studies confirming the positive influence as those questioning the effectiveness of educational spending in fostering growth. For example, Zhang and Casagrande (1998), Judson (1998), McMahon (1998; 2000), Kneller *et al*. (1999), Bose *et al.* (2007), Keller (2006), Blankenau *et al*. (2007), Baldacci *et al*. (2008) and Alfonso and Jalles (2013) all establish a positive association between aggregate measures of public education human capital expenditure and economic growth, whereas Landau (1986), Easterly and Rebelo (1993), Devarajan *et al*. (1996), Miller and Russek (1997), Blankenau *et al.* (2007), Mo (2007), Ghosh and Gregoriou (2008), Miyakoshi *et al*. (2010) and Bojanic (2013) find that these aggregate measures have a negative or statistically insignificant association. In a recent survey of empirical findings from twenty-nine studies on public spending education and growth, Awaworyi *et al.* (2017) find that the association was positive and statistically significant in fourteen studies, negative in twelve and statistically insignificant in the remaining three. From the thirty-four studies on both schooling and education spending surveyed here, eighteen establish a positive association while sixteen report a negative or statistically insignificant correlation.

Now, we focus the discussion on the findings in Africa, from which our own data are derived. The evidence from this continent is not just limited but is also inconclusive. Easterly and Levine (1997) investigated some of the drivers of Africa's economic growth rates in the 1980s and found several variables, including the average number of years of schooling, to be

[32] There are two main aggregate measures of education spending commonly used in the literature: expenditure on education as a percent of total government expenditure (or national budget) and as a share of gross domestic product. (World Bank, *World Development Indicators* (2018)).

crucial to the continent's long-run growth. Hoeffler (2002) uses a similar approach to Mankiw *et al*. (1992) and average number of years of education in Barro–Lee (1995) but finds no significant impact on economic growth in a sample of African countries. Bloom *et al*. (2006) analyse the link between human capital and economic growth based on a sample of countries from Africa and find that the average years of secondary education and tertiary education are not statistically significant, however, they emerge with a significantly positive impact when instrumented by literacy rates and doctors per capita, respectively. Appiah and McMahon (2002) and Chen and Gupta (2009), arrive at conflicting conclusions relative to the evidence adduced in Gyimah-Brempong *et al*. (2006) and Seetanah (2009). The former find no significant effects of school enrolment rates while the latter find a strong association for schooling years.

From the empirical studies reported here, it is certainly clear that the 'endogenous growth theory' has encountered severe difficulties in justifying its claims as key findings remain inconclusive. Even the appearance of new studies with more robust techniques and approaches has done quite little to confirm the predictions of its original hypothesis. What is particularly disturbing is that the only studies, to our knowledge, that have conducted proper robustness tests on the determinants of growth are sceptical in tone. Particularly eloquent among these sceptical writers are studies such as Levine and Renelt (1992), Levine and Zervos (1993), Sala-i-Martin (1997), Hoover and Perez (2004), Hendry and Krolzig (2004) and Sala-i-Martin *et al*. (2004) who constructed robustness tests to analyse the sensitivity of previous findings. For instance, Levine and Renelt (1992) analysed the robustness of several variables but only found 2 out of 40 to be robustly significant, and measures of education human capital were none of the robust ones. Sala-i-Martin (1997) using the Extreme Bound Analysis (EBA) and Doppelhofer *et al*. (2000) employing the Bayesian Averaging of Classical Estimates (BACE) confirm the lack of robustness of a variety of the commonly used explanatory variables. Hoover and Perez (2001) using a cross-sectional version of the general-to-specific search methodology and arrive at and smaller set of robust variables than found in Sala-i-Martin (1997).

The only solid conclusion which we are able to derive from this evidence is that none of the three measures of human capital proposed as an explanatory story to explain differences in growth rates across countries is robust or even markedly better or worse than any of the others. All are seriously imperfect, in the sense that none of them survive the robustness tests conducted by Levine and Renelt, Sala-i-Martin, and others.

To account of the potential problem of endogeneity caused by reverse causality between fiscal variables and growth and simultaneities among the education variables, studies separate the timing of the analysis where the current value of the explanatory variable only affects future values of the dependent variable. The methods of estimation frequently utilised in which variables that are suspected to be endogenous are lagged include the *2SLS*, *3SLS* and *GMM* (see Table 3.3). Several studies also lag the explanatory variables over a number of years so that the effect of a current change only materialises after some time.

Table 3.3: Regression studies on the impact of education on growth (Selection)

	Studies reporting positive findings		Studies reporting negative or insignificant findings	
	Author(s) and sample	**Education variable**	**Author(s) and sample**	**Education variable**
Overall	Landau (1983), 96 countries, 1961-72	Primary & secondary enrolments	Landau (1986), 65 low income countries, 1960-80	Total government spending on education (% of GDP)
	Romer (1989), 112 countries, 1960-85	Literacy rates	Lau, Jamison and Louat (1991), 58 developing countries, 1960-86	Average education attainment of labour force
	Azariadis & Drazen (1990), 71 countries, 1960-80	Literacy rates (in other countries but not high income)	Levine and Renelt (1992), 119 countries, 1960-89	Primary and secondary enrolments
	Barro (1991), 98 countries, 1960-85	Primary and secondary enrolment rates	Levine and Renelt (1992), 119 countries, 1960-89	Total government spending on education (% of GDP). Robustness tests find spending on education to be non-robust
	Mankiw *et al*. (1992), 98 countries, 1960-85	Secondary enrolments	Easterly and Rebelo (1993), 100 countries, 1970-88	Share of educational expenditure (public and private) as a share of the economy
	Harbison and Hanushek (1992), Brazil case study, 1980s	Improvements in cognitive skills at primary level led to better learning outcomes (measured by the fall in repetition and dropout rates)	Barro & Lee (1994), 85 countries 1965-85	Years of secondary schooling for female
	Barro & Lee (1994), 85 countries 1965-85	Years of secondary schooling for male	Benhabib & Spiegel (1994), 78 countries 1965-85	Years of schooling of adults (25+); adult literacy rate
	Barro & Sala-i-Martin (1995), 96 countries, 1960-2000	Male and female secondary and higher education	Durlauf & Johnson (1995), 98 countries 1960-85	Primary and secondary school enrolment rates; adult literacy rate
	Lee & Lee (1995), 17 high-income countries, 1970-85	1970 science scores of secondary school students	Lee & Lee (1995), 17 high-income countries, 1970-85	Primary and secondary school enrolment rates
	Barro (1996), 100 countries, 1960-90	Years of secondary and higher schooling for males	Devarajan, Swaroop & Zou (1996), 43 low income countries, 1970-90	Total government spending on education (% of GDP).
	McMahon (1998, 2000), East Asian countries	1965 primary and secondary gross enrolment rates Initial levels of secondary and higher education spending	Barro (1996), 100 countries 1960-90	Years of primary schooling for males Female schooling at all levels
	Bloom & Sachs (1998), 65 countries, 1965-90	Average years of secondary schooling	Collins & Bosworth (1996), 88 countries, 1960-94	1965 average years of schooling of adult population
	Zhang and Casagrande (1998), 69 countries, 1970-85	Expenditure on educational subsidies	Sala-i-Martin (1997), 1960-92	1960 primary school enrolment rates
	Judson (1998), 138 countries, 1960-90	Growth rates of education spending	Kelly (1997) 73, countries, 1970-89	School enrolment rates
	Temple (1999), 78 countries, 1965-85	Average years of schooling	Miller & Russek (1997), 39 countries, 1975-84	Total spending on education (% of GDP), negative in developing countries
	Kneller *et al*. (1999), 22 high-income countries, 1970-95,	Educational expenditure as share of productive public spending	Kelly (1997), 73 countries, 1970-89	Total spending on education (% of GDP), is insignificant
	Bils & Klenow (2000), 93 countries, 1960-90	Gross school enrolment rates and average years of schooling	McMahon (1998, 2000), East Asian countries	Tertiary enrolment rates

					Initial levels of spending on primary education is negative
	Hanushek & Kimko (2000), 31 countries, 1960-80	1960 Average score on internationally comparable math and science tests		Hanushek & Kimko (2000), 31 countries, 1960-80	Average years of schooling of 25+ year olds
	Krueger & Lindahl (2001), 68 countries, 1965-85	Change in and initial average years of schooling		Pritchett (2001), 1960-85	Average years of schooling of adults aged 25+
	Bassanini & Scarpetta (2001), 21 OECD countries, 1971-98	Average years of education of the working age population		Hoeffler (2002), 1960-90	Overall average years of secondary schooling of adult males aged 25+
	Hoeffler (2002), 1960-90	Male average years of secondary schooling of adult males aged 25+		Barro & Sala-i-Martin (2004), 1960-96	1960 gross secondary and higher enrolment rates
	Barro and Sala-i-Martin (2004), 1960-96	1960 gross primary enrolment rates		Hoover & Perez (2004), 107 countries, 1960-89	Average years of primary and secondary schooling
	Bloom *et al*. (2006), 1960-90	Change in, and initial, years of schooling		Gyimah-Bempong & Wilson (2004), 1960-2000	Average years of primary and secondary schooling
	Gyimah-Bempong & Wilson (2004), 1960-2000	Average years of higher schooling		Keller (2006), 40 Asian countries, 1971-2000	Expenditures on education as a share of GDP
	Bose, Haque & Osborn (2007), 30 low income countries, 1970-90	Total spending on education (% of GDP)		Blankenau, Simpson & Tomljanovich (2007), 23 developed countries, 1960-00	Total public expenditure on education (% of GDP)
	Baldacci, Clements, Gupta & Cui (2004), 120 low income countries, 1975-00	Education spending (% of GDP) has an indirect effect on growth		Mo (2007), 1960-85	Share and growth of education expenditure in GDP are negative and significant
	Hanushek & Woessmann (2008), 1960-96	Mean international maths and science test scores		Ghosh & Gregoriou (2008), 15 developing Countries, 1970-99	Education expenditure (% of total expenditure) has a negative effect
	Baldacci, Clements, Gupta & Cui (2008), 118 developing countries, 1971-2000	Education spending (% of GDP) has an indirect effect on growth			
Africa	McMahon (1987), 30 African countries, 1970-85	Primary, secondary and higher education		Bloom, Cunning and Gupta (1998) 18 African and 59 non-African countries, 1965-90	1995 years of secondary schooling
	Easterly and Levine (1997), African, Latin American and East Asian countries, 1960-90	Average years of schooling		van der Berg (2007), South Africa case study, 10 years after abolition of Apartheid	School enrolment rate expansion for black students did not close to learning gaps between black and white students Massive shifts of fiscal resources to black schools, did not reduce educational attainment differentials
	Stroup & Heckelman (2001), 44 African and Latin American countries, 1975-89	Average years of schooling of adult males		Eggoh, Houeninvo & Sossou (2015), 49 African countries, 1996-2010	Public expenditure on education as a share of GDP has a negative impact.

It is quite apparent from the current state of empirical knowledge, as summarised above, that development strategies encouraged by the development community focussing on education have not necessarily guaranteed higher growth in the context of low-income countries. Also, there are limited lessons for policymakers in developing countries and elsewhere who are desperately trying to promote higher economic growth rates into order to reduce poverty and inequality. There are several reasons identified for the lack of a consistent story on the education human capital-growth nexus are several ranging from omitted variable bias due to the few numbers of explanatory variables included in regressions, 'crowding out' effect created by the displacement of the more effective private sector efficiency by the seemingly inefficient public spending (Filmer at el., 2010), to variations in the institutional environment within which education policies are implemented (Pritchett, 1996; World Bank, 2003; Rajkumar and Swaroop, 2008). More recently, the issue of the quality of education human capital has also entered the debate. A few commentators have acknowledged that the mixed findings may be a reflection of the lack of improvements in 'pupil learning or schooling' which then limits the growth of the economy (Temple, 1999; Pritchett, 2001). However, for now these ideas have largely remained as suppositions: apart from very limited evidence from developed countries (Hanushek and Kimko, 2000; Hanushek, 2013) and some anecdotal evidence from a few case studies based on the World Bank's public expenditure trucking surveys, we do not have systematic evidence on the impact and drivers of the quality of education human capital in developing countries.

Given the limited evidence on the relationship between investment in human capital, including public spending on education, this chapter revisits and contributes to this literature in three ways: examine whether various components of public spending on education are differentially productive; we allow for country heterogeneity to empirically examine whether education spending is more effective in promoting growth in countries with good institutions; and draw attention to an issue which has recently attracted international attention and debate – and has led to an apparent shift in World Bank policy on human capital from more enrolments to more learning – that the quality of education human capital, which has been underexplored in the literature, is crucial for development. We hope that the findings from here can help low-income countries focus more of their scarce resources on strategies that are more effective in buoying long-run growth and avoid those that are less effective.

3.3.1 *Differential impacts between education levels*

One crucial assertion of 'endogenous growth theory' is that spending on education is considered as investment in human capital because it helps in increasing innovation, knowledge and skills which are likely to foster economic growth over time (Barro, 1991). For several decades, the World Bank has encouraged countries to devote more resources towards education as a key development strategy to increase human capital, particularly at primary level in preference to secondary and tertiary education based on the conventional wisdom within the development community that primary education tends to provide the highest return and is more equitable (World Bank, 1986; 1995). Spending patterns in developing countries clearly show that governments have increasingly been willing to invest in education (see Table 3.1). However, as reported in Table 3.3, several studies have called into question the impact of education spending on growth rates. But the findings from these studies are limited to aggregate measures of public spending on education (total spending on education as a share of GDP or the budget). An important issue in this literature which has also been suggested by the World Bank, but not thoroughly investigated on a cross-country basis, is the possibility that although total public spending on education may not be robustly correlated with growth, shares allocated to different components of education spending may be differentially productive. Given that the overall level of public spending on education level is lower in low-income countries in relation to middle- and high-income groups of countries, signalling that there is potential for increasing public investment in human capital, and the fact that governments in developing countries have been misallocating public resources, understanding which components of education spending – primary, secondary or tertiary – have been shown to be more effective is crucial in directing additional spending on education in order to promote growth.

We thus argue that clues to what is going wrong could also be derived from disaggregating human capital spending between its different components. Very little research exists on the link between components of education spending and economic growth. Research in this area has been hampered by a lack of data at a disaggregated level. A paper that is close to this study is one by Devarajan *et al*. (1996), who analyse the differential effects of specific components of education spending focussing on the shares spent on administration, management, inspection, operations of pre-primary, primary, secondary, tertiary and other forms of education, but excluding other important components such as infrastructure, books, teacher training and recruitment, which are equally important inputs in education.

This study contributes to the literature in three ways. First, we analytically focus on the differential direct impact of government spending on primary, secondary and tertiary education, but refrain from an a priori classification of any these components as 'more effective' or 'less productive', as suggested by the World Bank and other micro studies, and allow the data to show us how each of these shares of education spending is associated with the rate of economic growth in developing countries. Second, geographically we focus on Africa, the poorest continent where governments have intensely implemented development strategies of devoting more resources to education over the past decades but there is still scope for increasing spending. Thirdly, for our empirical analysis we use the most recent and up-to-date disaggregated dataset accounting for more recent developments from 1980 to 2014, as opposed the one employed by Devarajan *et al*. (1996), which cover the period 1970-1990.

3.3.2 The quality of education human capital

Another important mechanism recognised within 'endogenous growth' literature to lead to more human accumulation and higher growth is schooling (Mankiw, Romer, and Weil 1992). The World Bank, UNESCO's Education for All campaign and the UN Millennium Development Goals have stressed policies that promote human capital accumulation through expansion of school enrolments (World Bank, 1986; 1991; Hanushek and Woessmann, 2008). It has been argued that increasing the number of pupils enrolled in schools in addition to other policies can create more human capital is growth related. An analysis of trends in developing countries clearly indicate that education policies have led to a massive expansion of school enrolments and have almost closed the gap with other countries, especially at primary level (see Table 3.1) However, as reported in Table 3.3, the evidence on the link between measures of education such as school enrolments and the average number of years spent in school is inconclusive. Recently, some commentators have argued that these indicators of human capital do not necessarily reflect the essence of human capital implied by the original 'endogenous growth' hypothesis, as what generate real education human capital are improvements in knowledge and learning outcomes (Hanushek, 2013).

This issue, which has been less thoroughly investigated in macroeconomic studies, is now a big issue at present, and was at the centre of the 2018 *World Development Report*, in which the World Bank observes that pupils in low-income countries are facing a 'learning crisis' due to lack of effective learning (World Bank, 2018: p.71). The report notes that millions

of pupils that are attending school are "not actually learning", fearing that this may have been due to lack of improvements in the "quality of human capital that is crucial for growth" (Ibid: p.5). The 2018 *World Development Report*) also highlights a significant policy shift by the World Bank from the emphasis on school enrolments to the quality of education (measured by how much pupils do actually learn). The Report has also brought to light a potential predicament of policies which have focussed on massive expansion of schooling as a strategy for economic growth in developing countries: these policies may have been successful in increasing the number of pupils that are enrolled in school but may have at the same time led to a deterioration in schooling conditions and therefore the quality of education. Although the 2018 *World Development Report* and recent research has underscored the importance of learning and cognitive skills in the development process, the question of whether the quality of education is important in understanding the link between education and growth and what drives it is not completely clear. The research problem we wish to explore is whether the positive impact of increased investments in education are being overwhelmed by falling education quality as a consequence of over-expansion of quantity.

van der Berg (2007) explores this issue in the context of the South African education system, focussing on the relationship between improvements in access to schooling (quantity) and performance of black and white students (quality). The South African government had implemented educational policies which stressed universal school attainment for black children and youths aged up to 15 years; provided more fiscal resources to underprivileged black schools; and broke down racial barriers to allow more black students to attend formerly white schools. These policies resulted in a substantial increase in the number of black students attending primary and secondary schools, thereby reducing education attainment differentials between blacks and whites (*Ibid*: p.851). However, van der Berg (2007) finds no evidence that these policies which had reduced school enrolment differentials had also reduced learning outcome disparities based on matriculation performance in mathematics and physical science. He argues that education policies may have reduced variations in years spent in school between blacks and whites, but have not narrowed qualitative learning differentials, and goes on to conclude that "education attainment measured by years of schooling may exaggerate progress in cognitive levels mastered" (Ibid: p.854). Although his findings are based on education inequalities in South Africa, we argue that his findings are a reflection of what has typically transpired across Africa: educational policies have promoted massive school enrolments and

successfully achieved policy goals such as universal primary education, but learning outcomes (quality dimension of education) may have stagnated or even fallen.

The original 'endogenous growth' hypothesis human capital that reflects the amount of knowledge, skills or learning (Romer, 1990; Barro, 1991). However, there are severe difficulties in finding proper indicators of education human capital quality and the only studies that have attempted this exercise have employed measures such as internationally comparable mathematics and science test scores (Hanushek and Kimko, 2000; Hanushek and Woessmann; 2008). Students' scores in reading, mathematics and science tests published by the OECD's Programme for International Student Assessment, provide more ideal measures of learning achievements and reflect more appropriately education quality (OECD, 1999). The latest comparable dataset on education quality made public by the World Bank compares student achievement scores across countries (Altinok *et al.*, 2018). However, these data are only available for a limited set of high-income countries and less than half of African countries in our sample[33], making it difficult for our use here. Another drawback of these data in the context of our study is that low-income countries are less frequently tested. In the absence of suitable proxies for education quality, the '*repetition rates*' at primary level was selected as being the 'second best' option due to its advantage of somehow reflecting learning achievements against national standards but also being readily available and comparable on a cross-country basis. Undoubtedly, this measure has the limitation of sometimes not being completely comparable between countries, as '*repetition rates'* are based on each country' national educational systems.

As the ultimate objective of schooling is learning, one of the mechanisms of assessing the level of knowledge and skills achieved is student achievement against the set national standards. In almost all national educational systems, students are positively assessed and allowed to progress to the next grade when they have demonstrated that they have mastered a certain level of knowledge and cognitive skills appropriate for a particular level of education (typically based on results from national tests). Otherwise, they are forced to repeat grades when they can't demonstrate the level of learning expected at that level of education. Thus, it is assumed that those who are forced to repeat grades have not mastered the requisite cognitive

[33] Except for Burkina Faso, Botswana, Cameroon, Chad, Cote d'Ivoire, Kenya, Madagascar, Mauritius, Mozambique, Namibia, Senegal, South Africa, Swaziland (Eswatini) and Zambia.

skills and knowledge. Some studies have shown that school '*repetition rates*' is inversely linked to the level of knowledge and cognitive skills. In a study involving rural schools in Brazil, Harbison and Hanushek (1992: p.32) explored the link between acquisition of knowledge, cognitive skills and student learning achievements, as measured by "repetition and dropout rates" in primary schools in Brazil. They show that learning achievements (repetitions) at primary level were affected by student ability to acquire knowledge and the level of cognitive skills. On this evidence and the claim by 'endogenous growth' hypothesis, it is reasonable to suppose that the quality of education, and therefore economic growth, will be higher in countries where *repetition rates* are lower. However, what drives the quality of education and what impact it has had on growth is less thoroughly analysed in the literature. In this chapter, we seek to understand the growth impact and drivers of the quality of education in the light of the World Bank policy shift and the evidence from the South Africa case study by van der Berg. Resolving this puzzle could perhaps help policymakers in low-income countries focus more of their scarce resources on development strategies that are more effective in buoying long-run growth and avoiding those that inappropriately cause a drag on growth if they are to fight poverty and inequality.

3.3.3 Institutional factors determining the effectiveness of public spending on education

It is recognised in the literature that the quality of institutions of governance is an essential element in determining the effectiveness of policy, and especially in developing countries weak or poorly functioning institutions are cited as one of the main reasons why countries find it difficult to translate policies into tangible development outcomes (World Bank, 2003). Several empirical studies have examined the relationship between various indicators of institutions of governance and development outcomes, and many of them show that development outcomes tend to be better in countries with well-functioning institutions. Research has recognised that the link between public spending and development outcomes may in practice possibly be broken when institutions are weak or malfunctioning. For example, Rajkumar and Swaroop (2008: p.102) establish that public expenditure on health and education leads to improved school attainment and lower infant mortality rates in countries with good governance – as measured by the "level of corruption and the quality of bureaucracy". Morozumi and Veiga (2015) find evidence that aggregate measures of public capital expenditure promote economic growth in countries where institutions compel the executive to be accountable to the citizens using a range of different proxies of government accountability.

Other studies also show that high levels of corruption lead to inefficient allocation of public resources, which may possibly effect growth (Gupta *et al*., 2005). Based on this evidence, it is clear that studies which have examined the link between public spending on education and growth have captured only a part of the story. We argue that we need to bring into the story country heterogeneity such as the institutional environment within which educational spending policies are designed and implemented.

The institutional environment can in practice affect the effectiveness of public spending on education in several other ways. In countries with weak or poorly functioning institutions, public resources tend to be inefficiently allocated both across and within sectors and therefore are less likely to guarantee the desired outcome. An example of poor budgetary allocations being a situation where resources are sub-optimally allocated towards a single or few activities at the expense of other equally important activities which are crucial in promoting growth, resulting in wasteful or inefficient utilisation. Also, public spending on education is less likely to deliver desired outcomes (higher learning, competencies and skills) crucial for the accumulation of human capital if there is no incentive mechanism in the public sector to use available resources for productive purposes or when fiscal resources allocated towards education are poorly managed. For instance, public spending may not lead to desired outcomes if both externally and internally generated resources are not actually spent on the intended programmes due to leakages, embezzlement or theft in the flow of funds towards such programmes, as the associated loss hampers human accumulation and thence economic growth. Leakage in public resources has been identified as one of the problems affecting the management of the public resources in developing countries such as Peru in 2001-02 (Lopez-Calix *et al*., 2002). Reinikka and Svensson (2004: p.679) report that "only 13 percent of the capitation grant for non-wage expenditure was received in Ugandan schools during the period 1991-95". Lastly, education spending policies may not be effective where institutions mandated to implement them lack the capacity to effectively do so.

The crux of the matter here is that public spending is likely to be more productive if additional spending is optimally allocated and utilised on intended education programmes so that it translates into things which matter for the accumulation of human capital such as recruitment and training of more teachers; availability of more teaching and learning materials so that teachers effectively perform their duties and students learn more and better; and more classrooms built so that more students have access to education. These are the issues at the

centre of transforming education spending into better-quality education and ultimately, growth (Gemmell, 2004). Therefore, our argument here is that the weak link between education spending and growth reported in some studies does not necessarily imply that governments are spending on unproductive programmes, but that its effectiveness may be hampered by other non-economic factors including the environment in which education policies are designed and implemented. It is these interlinkages between education spending, institutional environment and economic growth that we wish to examine empirically in this chapter.

Acknowledging the major role played by the institutional environment, in this chapter we seek to assess whether and how institutions affect the effectiveness of public spending on education in promoting growth. In particular, we focus on institutional aspects that affect government's accountability to its citizens and its effectiveness in policy design and implementation. We measure the quality of institutions by democratic accountability and institutionalised constraints on the executive (both of which are proxies of accountability) and bureaucratic effectiveness as likely to affect the effectiveness of public education spending and the economy's productivity. This study is closely related to the work of Rajkumar and Swaroop (2008) and Morozumi and Veiga (2016). A crucial difference is that Rajkumar and Swaroop (2008) analyse the link between impact of governance on the effectiveness of public spending on education and health on schooling and infant mortality rates, respectively. Morozumi and Veiga (2016) analyse the role of democratic accountability in promoting the growth effect of capital and recurrent expenditure. Also, none of these studies focuses exclusively on Africa.

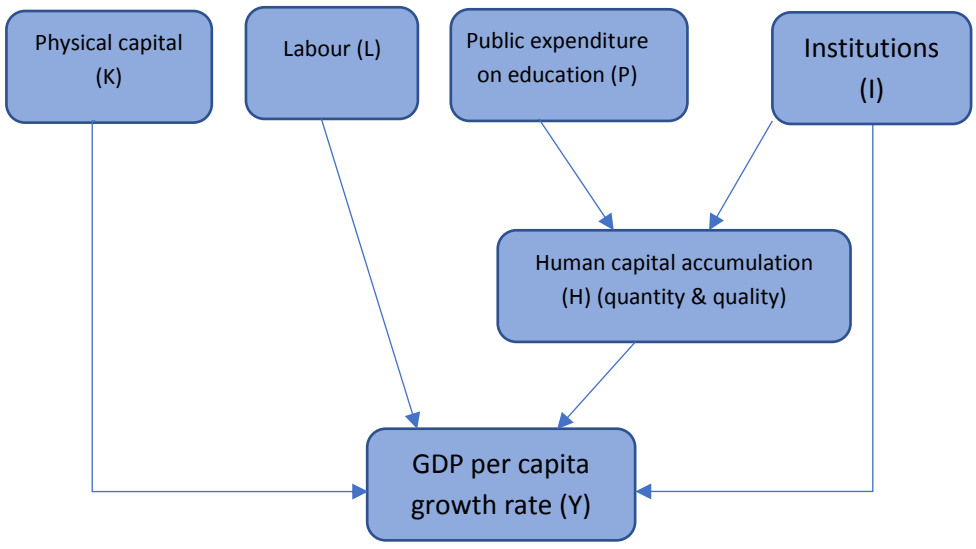
3.4 Empirical approach

Our empirical approach follows the standard approach employed in the literature, with some adjustments in variables included, to empirically analyse the three ideas conjectured in the previous section, namely: the differential effects of education spending, importance of education quality in human capital accumulation and whether the institutional environment matters for the effectiveness of education spending. Apart from specifying a model that captures the essence of 'endogenous growth theory' and enables us to empirically test these relationships, in this section we also describe the data and its sources, and the estimation techniques used.

3.4.1 Model specification – new growth model

Our starting point is to outline a model which embodies the central ideas of 'endogenous growth theory', in which human capital propels other factors of production to generate growth, and that policies which raise human capital, and for our purposes here, improvements in the quality of human capital can lead to more growth. Several studies that follow this framework have identified channels linking public spending on education and human capital with long-run growth. According to the standard growth models developed in Barro (1991), Devarajan *et al*. (1996), Temple (1999), Pritchett (2001), Baldacci *et al*. (2008) and others, the main dependent variable (per capita GDP growth) is assumed to be determined by the accumulation of physical capital, labour, human capital and policies and institutions that propel human capital. We then modify these models, by incorporating the influence of shares of public spending on primary, secondary and tertiary levels of education, quality of education and the quality of institutions, as discussed above. The picture of the story we have discussed in the previous section can be formally presented in an arrow diagram as illustrated in Figure 3.2, which represents our baseline empirical model:

Figure 3.2. The core model linking key variables and growth



Our baseline framework suggests that long-run growth is driven by the stock of physical capital (K), labour (L), the quantity and quality of human capital accumulation (H), which is in turn influenced the public spending on education and the quality of institutions (I), and that

institutions can also directly influence economic growth. The picture in Figure 3.2, which captures the essence of 'endogenous growth theory', may be represented as a linear single equation as is standard in the literature in the functional form as specified earlier in equation (3.3) and restated here as follows:

$$Y = f(K, L, P, H, I) \qquad (3.3)$$

Our baseline estimating equation for growth, based on the baseline model in Figure 3.2 and equation (3.3) can be specified in the following reduced form:

$$Y_{it} = \alpha_0 + \alpha_1 K_{it} + \alpha_2 L_{it} + \vartheta \sum_{k=1}^{3} P_{it}^{k} + \delta \sum_{j=1}^{2} H_{it}^{j} + \varphi I_{it} + \lambda_t + \varepsilon_{it} \qquad (3.4)$$

where i stands for country and t for year. The other notations in the equation represent our variables as follows:

Y_{it} = annual GDP growth rate in percent observed in country i at time t. This dependent variable is measured by the average annual growth rate of real GDP per capita based on constant 2010 US dollars. This variable is converted into 5-year forward moving averages to capture long-run effects of current policies. This implies that current values of explanatory variables are expected to affect growth in 5 years' time;

K_{it} = is our measure of the stock of physical capital in the economy commonly used in the empirical literature (Barro, 1991; Mankiw *et al.,* 1992), represented by the ratio of total investment or gross capital formation in GDP. The variable includes expenditure on fixed asserts, improvements to land, plat, machinery and purchase of equipment. It also includes construction of physical infrastructure such as housing, office and commercial buildings, schools and hospitals. It also includes increases in inventories such as stocks or interest.

L_{it} = represents the change in the stock of labour available in the economy. A common proxy employed in these studies is population growth rate. It is measured by annual population growth rate from year (t-1) to (t), expressed as a percentage;

P_{it}^{k} = a vector of sectoral composition of public spending on education, disaggregated into shares of public resources allocated towards primary (P_{it}^{1}), secondary (P_{it}^{2}), and tertiary (P_{it}^{3}) levels of education;

H_{it}^{j} = our measure of human capital attributable to education and enters the model as a product of the quantity (H_{it}^{1}) and quality (H_{it}^{2}) of education. These variables enter the model separately given the desire to capture whether they are differentially effective in promoting growth. The quantity of education is expressed as gross school enrolment rates and represented by the ratio of total enrolment to the population of the age group that officially corresponds to the level of education shown. Primary education provides basic reading, writing, and mathematics skills along with an elementary understanding of such subjects as history, geography, natural and social sciences. Secondary education completes the provision of basic education started at primary, and aims at laying the foundations for lifelong learning and human development. Tertiary education focuses on advancing specialized and lifelong skills. The quality of education, which is one of the variables of interest in this study, is measured by the proportion of students who are forced to repeat at all levels of primary education and used here as the second-best option as mentioned earlier. This variable is assumed to have an inverse association with quality, a higher percentage of repeaters generally corresponds to a lower quality of education human capital;

I_{it}= indicators of institutional environment measured by three different indicators, namely '*democratic accountability*' and the extent of '*constraints on the executive*' from the Polity IV database. This is the measure of institutionalised accountability produced by the Polity IV index and is derived as an aggregate of Polity's measures of competitiveness of political participation, openness and competitiveness of executive recruitment, and constraints on the president or chief governmental executive. We also use '*bureaucratic effectiveness'* from the International Country Risk Guide (ICRG) and the World Bank *Worldwide Governance Indicators*. The variable measures institutional strength and effectiveness of the bureaucracy towards policy formulation and implementation, and the credibility of the government's commitment to such

policies. Because of high correlations between each of these variables, the three indicators enter the model separately;

λ_t = captures unobservable time-specific fixed effects not captured by the other explanatory variables; and

ε_{it} = denotes the error term.

Our estimating equation (3.4) incorporates the innovations which we have suggested above as a possible step towards explaining the paradox of an inconsistent empirical impact of investments in education human capital in growth regressions, namely that public spending on education is disaggregated by educational levels (primary, secondary and tertiary) and that the estimated coefficients are not equal; we devise and estimate a new 'quality of education human capital' measure namely '*repetition rates'*, as described above whose estimated coefficient is expected to be negative given the inverse relationship; and we incorporate the role of institutional quality indicators into the growth equation with the estimated coefficient expected to be positive. Thus, our key variables of interest here are P_{it}^{k}, H_{it}^{2} and I_{it};

An important extension to our baseline model relates to the role of the institutional environment in determining the impact of public spending on education human capital on growth. In order to assess this institutional influence, the standard approach is to interact the two variables – the measure of public education expenditure policies $\left(P_{it}^{k}\right)$ with the indicator of the institutional environment (I_{it}). This method draws upon the approach in Burnside and Dollar (2000) who examined whether the effects of foreign aid on growth was conditional on good policies and Rajkumar and Swaroop (2008) who explored whether the quality of governance can affect the effectiveness of social spending on social outcomes. The inclusion of the interaction term $\left(P_{it}^{k} * I_{it}\right)$, which is specified in 3.5, will enable us to test empirically whether the quality of domestic institutions can propel or foil the impact of public education spending on education to generate more economic growth. We bring the influence of institutional factors on education spending into the model, closely following the work of Rajkumar and Swaroop (2008), by specifying our new model in the following form:

$$Y_{it} = \alpha_0 + \alpha_1 K_{it} + \alpha_2 L_{it} + \vartheta \sum_{k=1}^{3} P_{it}^{k} + \delta \sum_{j=1}^{2} H_{it}^{j} + \varphi I_{it} + \psi \sum_{k=1}^{3} P_{it}^{k} * I_{it} + \lambda_t + \varepsilon_{it} \quad (3.5)$$

The interaction term $P_{it}^{k} * I_{it}$ in equation 3.5 will enable us to empirically examine whether public spending on education is more effective in promoting economic growth in countries with strong and sell-functioning institutions. Several studies in this area, including some of the influential contributions by Romer (1989), Barro (1991), Mankiw *et al*. (1992) and others employ cross-sectional regression analysis involving a large number of countries, where the left-hand side variable is averaged over a fairly long period (usually 5 or 10, or more years), and the right-hand side variables are either long run averages or variables relating to the beginning of the period. Here we use panel data regression analysis, which has the advantage of exploiting the time dimension of the data. Estimating our models using panel data regressions has the advantage of controlling for unobserved country-specific fixed effects as well as capturing the evolution of the variables overtime.

Different types of estimators have been employed in previous studies. In this chapter we first employ the *robust OLS* to estimate the two main equations, 3.5 and 3.5. The *OLS* is preferred because it allows us to compare our results with most of the previous findings, because it is one of the widely utilised estimators as can be noted in selected studies provided in Appendix 3.1. Incorporating time-specific fixed effects has the advantage of producing estimates that are robust to heteroscedasticity and autocorrelation. We also implement a variant of the Generalised Least Squares estimator, the *Feasible Generalised Least Squares* (FGLS) estimator, as a check on the robustness of our findings. The FGLS also has the advantage of correcting for both autocorrelation and heteroscedasticity. However, there may also be potential problems of simultaneity or reverse causation among the variables. For instance, government spending on education can raise per capita GDP, and can also be influenced by per capita GDP. There are various ways of reducing this problem. In this study we try to reduce this problem by utilising an instrumental variable estimator commonly employed in previous studies, *Two-Stage Least Squares* (2SLS), to try and address any concerns for potential endogeneity and reverse causality. Although the 2SLS estimator enables us to address the potential endogeneity issues including reverse causality, its success depends on finding valid instruments which are strong enough to deal with this problem. Tests for the validity of instruments are conducted and reported together in respective tables of estimates below.

3.4.2 Data description and summary statistics

In our empirical analysis, we use an unbalanced dataset of annual observations on a sample of 42 African countries covering the period from 1980 to 2016 to examine the effects of public spending on primary, secondary and tertiary levels of education, the importance of quality in assessing the effects of education and the role of institutions in propelling public spending to generate economic growth. A full list of countries in our sample is provided in Appendix 3.2. Most empirical studies in this field use data which is averaged over some period, typically ranging between five and ten years. The period is even longer in studies that use cross-sectional data. In our analysis here, we convert our dependent variable into 5-year forward moving averages to abstract from short-term business cycle fluctuations, smooth out temporary fluctuations in the data and possibly address the problem of missing observations. The use of multi-year forward moving averages also helps in capturing the long-run effects. All our explanatory variables that are used in this chapter are based on annual observations.

However, one potential critique of converting the data into forward moving averages is that this can introduce a problem of autocorrelation in the error terms within a country sample due to the use of overlapping observations (when generating forward moving averages). Using the standard OLS estimator in such circumstances may lead to incorrect standard errors, although the estimates will be consistent. To correct the standard errors, we follow Devarajan *et al*. (1996: p. 324) and estimate our parameters using an OLS estimator whose standard errors are corrected for possible autocorrelation and heteroscedasticity but also the FGLS estimator to check for the robustness of the results.

Our dependent variable for the growth models, Y_{it}, is the annual GDP per capita growth rate measured in percent based on constant 2010 U.S. dollars, from the International Monetary Fund's World Economic Outlook Database (October 2018). The data for this variable is converted into 5-year forward moving averages as discussed earlier. Turning to our explanatory variables, we follow the standard literature as reported in Table 3.3 and employ total investment as a share of GDP to proxy for a country's physical capital formation (K_{it}). Capital formation entails improvements to an economy's fixed assets (land, plant, machinery, equipment, and physical infrastructure like roads, railways, schools, hospitals, housing and private buildings, etc) and inventories (stocks of goods and work in-progress). We employ the annual growth rate

of the population as a measure of changes in the stock of labour (L_{it}), obtained from the World Bank's *World Development Indicators* (2018);

The indicators of public education spending on education, which again are of significant interest here are educational spending categories of primary (P_{it}^{1}), secondary (P_{it}^{2}) and tertiary (P_{it}^{3}) levels of education, expressed as percentages of total government expenditure on education. The disaggregation of public spending into these components also helps in evaluating the long-held conventional wisdom in development circles that low-income countries should prioritise investments in primary education, which has led to the prioritisation of spending on primary education in preference to secondary and tertiary levels of education. One possible weakness of the categories of education spending is the large number of missing observations, especially prior to the 1990s resulting in the variables which have the smallest number of observations among our variables, are obtained from the World Bank's *World Development Indicators* (2018)

The other explanatory variable of interest in this chapter is education human capital (H_{it}^{j}), which has two dimensions: quantity and quality of education human capital. The dimension representing the quantity of education human capital (H_{it}^{1}) is measured by primary and/or secondary gross enrolment rates. These variables measure the number of pupils that are enrolled in a particular grade as a proportion of the total population of children corresponding to that age group. The quality dimension (H_{it}^{2}) is proxied by our second-best choice, repetition rates, because quality is often difficult to capture. The path-breaking study by van der Berg (2007) uses mathematics and science matriculation scores in South Africa, however, to the best of our knowledge, such data are hardly publicly available in most African countries. Our own approach, therefore, is to employ the percentage of repeaters at all levels of primary education, which of course embody an element of students' achievement in various subjects. *A priori* we would expect, therefore, that the percentage of repeaters would to have an inverse association with the quality of education human capital and thence with the effectiveness, ceteris paribus, of public educational expenditure. Such data have newly become available at the World Bank and for this study are taken from the *World Development Indicators* database.

Our indicators of the institutional environment: '*democratic accountability'* measures the existence of procedures for citizens to express their preferences about policies and leaders,

voice their concerns, demand explanations and impose sanctions for the performance of elected officials and ranges between -10 (complete absence of accountability mechanisms) and +10 (existence of very strong accountability mechanisms); '*institutionalised constraints on the executive*' measures the extent to which decision-making powers of the executive are legally constrained by the existence of checks and balances, and variable ranges between 0 (very few restrictions) and 7 (very many restrictions); and '*bureaucratic effectiveness'* which measures the level of expertise in policy formulation and implementation and commitment to such policies, and ranges between 0 (very poor capacity) and 4 (very good).

Standard 'endogenous growth' regressions also include the initial level of per capita GDP in growth estimations to capture the idea of conditional convergence[34] first introduced by Barro and Sala-i-Martin (1992) and is expected to be negative; measures of the macroeconomic environment such as inflation; and the budget deficit as a proxy for how additional education spending is financed and also to capture possible crowding-out effects from borrowing. Data for the initial level of development and deficits are from *World Development Indicators*, while annual inflation rate data are from the IMF's *World Economic Outlook* database.

Table 3.4: Summary statistics

Variable	Notation	Obs	Mean	Std. Dev.	Min	Max
GDP per capita growth	Y	334	1.04	3.28	-11.89	11.80
Physical capital	K	325	21.97	11.21	1.11	67.32
Population growth	L	336	2.59	0.87	-3.67	5.54
Human capital quantity						
Gross primary school enrolment rates	H	313	89.98	27.45	20.20	146.90
Gross secondary school enrolment rates	H	280	32.87	23.03	2.86	113.24
Human capital quality						
Repetition rates, primary (% of total enrolment)	H	270	16.20	9.71	0	41.44
Quality of policies						
Expenditure on education (% of total government expenditure)	P	185	16.78	5.18	5.26	29.23
Expenditure on primary education (% of government expenditure on education)	P	192	44.83	11.40	19.20	98.67
Expenditure on secondary education (% of government expenditure on education)	P	188	29.62	10.01	0	64.14
Expenditure on tertiary education (% of government expenditure on education)	P	202	18.25	7.98	0	44.59
Quality of institutions						
Bureaucracy quality	I	228	1.36	0.89	0	4
Institutionalised constraints on the executive	I	313	3.47	1.94	0	7
Democratic accountability	I	313	-1.32	19.16	-10	10

[34] The concept of conditional convergence provides that countries that are relatively poor tend to grow faster than richer countries (Barro and Sala-i-Martin, 1992).

Macroeconomic factors						
Inflation rate		329	39.37	364.45	-4.24	6,424.98
Initial GDP per capita		304	1,622.73	2,238.29	190.48	12,139.81
Deficit		246	-2.62	3.84	-22.58	14.81
Pupil-Teacher Ratio	PTR	292	42.88	13.31	12.96	94.49

Source: World Bank *World Development Indicators;* IMF *World Economic Outlook.* For the following countries, there are missing values: Countries with missing data are: Angola, Burundi, Benin, Burkina Faso, Central African Republic, Cameroon, Congo Rep., Gambia, Guinea-Bissau, Madagascar, Mali and Mauritania.

3.5 Empirical findings – quantitative results

Before presenting and discussing our estimation results, we first estimate simple correlations, using the Pearson's Product-Moment Correlation between our variables of interest, education and institutional variables, and per capita GDP growth rate. These correlations provide insights into the association between the variables and the direction of the relationship. We conducted both simple and partial correlations based on the model specification in equation 3.4. The Pearson's pairwise correlation matrix is presented in Table 3.5.

Table 3.5: Pearson's pairwise correlation matrix of key variables

		Growth (Y_{it})	School enrolment rates (H_1)			Quality (H_2)	Public spending on education (P_i)			Institutions (I_i)	
			Prim	Sec	Ter	Repeat	Prim	Sec	Ter	Democ	Xconst
Growth (Y_{it})		1									
School enrolments (H_1)	Prim	0.30	1								
	Sec	0.32	0.53	1							
	Ter	0.30	0.31	0.77	1						
Repetition rates (H_2)	Repeat	-0.29	0.00	-0.37	-0.32	1					
Public spending on education (P_i) .	Prim	-0.14	-0.04	-0.37	-0.38	0.07	1				
	Sec	0.13	-0.01	0.42	0.43	-0.17	-0.60	1			
	Ter	0.04	0.07	-0.23	-0.09	0.24	-0.32	-0.36	1		
Institutions (I_i)	Democ	0.24	0.16	0.20	0.13	-0.16	-0.03	0.02	-0.06	1	
	Xconst	0.23	0.15	0.15	0.09	-0.13	-0.01	-0.01	-0.04	0.996	1

The results indicate positive but weak partial correlations between all our measures of education, government spending on secondary and tertiary education, our indicators of the quality of institutions and the growth rate per capita GDP. The correlation between our measure of education quality and growth has the projected negative sign indicating possibly that the quality of human capital important for growth. Government spending on primary education

which emerges with a counter-intuitively negative sign. For the simple bivariate correlations between different explanatory variables, the results indicate that, with the exception of the correlation between democratic accountability and executive constraints, most of the correlations are less than 0.50, suggesting that multicollinearity may not be a serious issue in our estimations. The coefficient of almost 1.000 between democratic accountability and executive constraints suggests that these two may not be included in equation 3.4 at the same time.

3.5.1 Baseline results – education spending, human capital and institutions

In this section, we present and discuss our baseline findings. Table 3.6 presents the results from the robust *OLS, feasible generalised least squares* and the instrumental variable *two-stage least squares estimators* based on equation (3.4). In column (1), we show the results for the indicator of aggregate public education spending as a starting point, and is intended to assess whether education spending as a whole has any effects on growth in Africa. The estimated coefficient emerges as positive but statistically insignificant using all estimation methods, indicating like several other studies reported in Table 3.3, that overall public spending on education has not made a significant contribution to economic growth in Africa over the past three decades[35].

In column (2), we disaggregate education spending into three shares of primary, secondary and tertiary expenditure. The estimated coefficients on all categories of spending emerge with ambiguous estimates. For primary education, the estimated coefficient is positive and significant at 10 percent level under the OLS estimator (column 2), negative and insignificant under the FGLS estimator (column 3) and negative and statistically significant under the instrumental variable estimator 2SLS (column 4). However, because of the differences in the estimates and given the superiority[36] of the instrumental variable estimator in the presence of endogeneity (simultaneities and reverse causality), we interpret our findings

[35] In our 2SLS regressions, the instruments are the lagged values of the endogenous variables (physical capital, education spending, and human capital) and also overall government expenditure as an additional instrument for physical investment, and population under 15 as an instrument for human capital. Using lagged values of endogenous variables as instruments could potentially create a problem if those lagged values are also endogenous. However, the tests for endogeneity and overidentification restrictions carried out in Table 3.5 suggest that these instruments are in fact valid.

[36] In the presence of endogenous explanatory variables, OLS estimates tend to be biased (Glewwe et at., 2014: p.381). The FGLS on the other hand only provides estimates when heteroscedasticity or first-order correlation is suspected but does not address endogeneity (Baldacci et al. 2004: p.12).

on educational spending in terms of 2SLS, which suggests that primary education not only has an insignificant impact on growth but may in fact have a negative effect.

Table 3.6: Education spending, human capital and institutions [equation 3.4]

Estimation method	Robust OLS		FGLS	2SLS
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
Constant	0.687 (0.90)	5.212* (1.96)	3.924* (1.79)	10.618** (2.21)
Physical investment (K)	0.058*** (3.78)	0.044** (2.25)	0.030** (2.30)	0.041* (1.74)
Labour supply (L)	-0.474** (2.79)	-0.620*** (2.75)	-0.324* (1.65)	-0.774** (2.43)
Total education spending	0.118 (1.17)			
Primary education spending		0.045* (1.65)	-0.027 (1.25)	-0.085** (2.12)
Secondary education spending		0.019 (0.66)	-0.001 (0.005)	-0.039 (0.73)
Tertiary education spending		-0.011 (0.39)	-0.018 (0.80)	-0.030 (0.66)
Primary enrolment rates	0.004 (0.73)	0.008 (1.24)	0.017** (2.40)	0.0005 (0.06)
Secondary enrolment rates	-0.012 (0.81)	-0.006 (0.40)	0.004 (0.28)	-0.0007 (0.38)
Tertiary enrolment rates	0.096*** (3.18)	-0.074 (0.69)	-0.016 (0.45)	-0.018 (0.47)
Repetition rates		-0.074*** (2.77)	-0.108*** (5.00)	-0.058** (2.33)
Democratic accountability	0.027*** (3.44)	0.024** (2.44)	0.012* (1.76)	0.031*** (2.75)
Initial income level	-0.0003* (1.82)	-0.0007*** (3.14)	-0.0006** (2.15)	-0.0006** (2.41)
Budget balance	0.005 (0.90)	0.005 (0.21)	0.009 (0.68)	0.044 (1.45)
Observations	222	164	159	115
R-squared	0.3194	0.4116		0.4734
Test for endogeneity				
Durbin score				0.7258
Wu-Hausman				0.7754
Test for over-identification restrictions				
Sargan score				0.3867
Basmann				0.4317
Prob > F	0.0000	0.0000	0.0000	0.0000

Notes: The dependent variable is measured as 5-year forward moving averages of the annual growth rate of GDP and all control variables are measured as annual observations (see Table 3.2). Our estimation methods are OLS with white-corrected standard errors, FGLS correcting for heteroscedasticity and autocorrelation and 2SLS. Time-fixed effects which are expected to affect growth are included where appropriate to reduce potential bias caused by omitted variables (Temple, 1999). Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

The estimated coefficients on secondary and tertiary spending categories emerge as insignificant correlates, with surprisingly negative signs across the *FGLS* and the *2SLS* for the secondary category and negative across all specifications for the tertiary category. At this stage, it remains unclear whether the shares of education spending are differentially productive. A possible explanation for these ambiguous results is the paucity of education spending data, which as mentioned earlier are notoriously weak with many gaps over many years.

Turning to the results for another variable of interest in this study, the importance of both the quantity and quality of education in understanding the link between human capital accumulation and long-run economic growth. Initial results based on the baseline equation indicate that across all the three specifications reported in columns (2), (3) and (4) that common indicators of human capital attributable to education, school enrolment rates do not emerge as significant correlates with growth. These regression results show that the estimated coefficient on primary school enrolments is positive but insignificant, while on secondary and tertiary they are mainly negative and insignificant. A joint F-test for the significance of the three quantity variables used here produces a test statistic, F(2, 72) = 1.65 with a probability Prob > F = 0.1861, apparently giving support to the sceptical view in several empirical studies reported in Table 3.3 that education human capital quantity has no impact on growth. The policy implication of this finding is that development strategies that have placed undue focus on the expansion of school enrolments have not put African countries on a strong foundation for long-run economic development. Also, this finding offers no support towards the conventional wisdom in development circles that countries which prioritise and invest in primary education are likely to reap more growth dividends than those which invest in secondary and tertiary education, as asserted by the World Bank and others (World Bank, 1995).

Turning to another variable of great significance to this study, the quality of education, the results show a negative and statistically significant relationship between repetition rates and per capita real GDP growth. A one percentage point increase in repetition rates (lower quality) reduces the per capita real GDP growth rate by between 0.6 and 1.0 percentage points. Given that there is an inverse relationship here, this finding can also be interpreted as a fall in repetition rates (improvement to quality) leads to a 0.6-1.0 percentage point increase in per capita real GDP growth. on this evidence, we argue that that improving the quality of education provides a clear boost to economic development, much more than by school enrolments. The policy significance of these finding is that although focussing on increasing school enrolments

is important, it is not sufficient and should be complemented with the goal of improving the quality of education in order to make human capital more effective in promoting growth.

Table 3.7 also shows the results on the direct influence of institutions of governance. At this stage we focus on the effects of democratic accountability as our first measure of institutional environment. The estimated coefficient on this variable is positive and statistically significant, implying that in Africa an improvement in democratic accountability of one standard deviation improves the growth rate of per capita real GDP by about 0.02-0.03 percentage points. This finding, which corroborates the findings of other studies (Baldacci *et al*., 2004; Rajkumar and Swaroop, 2008) is robust across all estimators. This result suggests that growth is expected to be higher on average in countries where the quality of institutions is better. This finding has important implications for enhancing economic growth, as lessons from this can be particularly relevant for low-income countries, where the quality of institutions and economic growth rates are often low (Collier, 1991; Barro, 2002).

The results for the other variables in our model show that the estimated coefficient on physical capital is positive and significantly correlated with the growth rates of per capita real GDP. A one percentage point increase in physical capital is associated with a 0.03-0.05 percent point improvement in per capita real GDP growth rate. This robust positive relationship between investment and growth is consistent with the findings of other studies on drivers of growth (Levine and Renelt, 1992). A comparison of the estimated coefficients between physical and human capital shows that in Africa the quality of education which had a larger growth effect than physical capital during the period 1980-2016.

In recent decades, the rapid population growth rates have frequently been invoked to try and explain Africa's poor development performance. In this study, population growth rate which is our measure of *labour supply* (L) appears to have imposed a great burden on the region's economic growth prospects. The estimated coefficient is negative and significant, with a one percentage point increase in population size predicted to lower the growth rate of the economy by 0.3 to 0.8 percentage points. The estimated coefficient also indicates that the population growth rate is one of the factors which significantly contribute to low economic performance in Africa. The coefficient on the *initial level of income* at the beginning of every period is negative but very weak in most specifications, suggesting the existing of weak conditional convergence in Africa. Finally, the budget deficit, which is included to account for

how increases in educational spending are financed, emerges with an insignificant coefficient – perhaps indicating that it does not play a significant role.

3.5.2 Institutional factors determining the effectiveness of public spending on education

Our next primary interest here is in gaining a better understanding of public spending on education and its interaction with institutions of governance. In its *2018 World Development Report*, the World Bank claims that to overcome the learning crisis of the past five decades and "achieve educational goals will certainly require better and more effective ways of spending in the coming decades" World Bank, 2018: p.187). Thus, the question we wish to tackle here as part of our contribution to the literature is whether the quality of institutions, measured by the executive constraints, democratic accountability and bureaucratic effectiveness, can propel public spending on education to generate higher growth and enable African countries their educational goals. We continue to focus on the share of primary, secondary and tertiary education spending, which we estimate using equation 3.5. The results are reported in Tables 3.7 and 3.8. In columns (5), (6) and (7) of Table 3.7 we report estimates from the OLS, FGLS and 2SLS on executive constraints, respectively and columns (8) and (9) of Table 3.8 OLS results for bureaucratic effectiveness and democratic accountability.

Table 3.7. Institutional factors and effectiveness of educational spending [Executive constraints]

Estimation method	**OLS**	**FGLS**	**2SLS**
Explanatory variables	**(5)**	**(6)**	**(7)**
Constant	2.774 (0.93)	2.783 (1.29)	3.575 (0.62)
Physical investment (K)	0.043** (2.20)	0.026** (2.08)	0.050** (2.10)
Labour supply (L)	-0.534*** (2.35)	-0.275 (1.39)	-0.599* (1.79)
Primary education spending	-0.024 (0.82)	-0.014 (0.65)	-0.040 (0.73)
Secondary education spending	0.034 (1.10)	0.001 (0.06)	0.004 (0.07)
Tertiary education spending	0.024 (0.73)	0.002 (0.08)	0.095 (1.28)
Primary enrolment rates	0.011 (1.51)	0.017** (2.43)	0.011 (1.13)
Secondary enrolment rates	0.007 (0.46)	0.020 (1.32)	0.004 (0.24)
Tertiary enrolment rates	-0.054* (1.78)	-0.045 (1.33)	-0.047 (1.20)

Repetition rates	-0.086*** (3.30)	-0.109*** (5.34)	-0.084*** (3.27)
Executive constraints (xconst)	0.185*** (5.13)	0.158*** (4.09)	0.320*** (3.04)
Executive constraints x primary education spending	-0.001*** (2.69)	0.000** (2.34)	-0.001 (1.16)
Executive constraints x secondary education spending	0.000 (0.54)	0.000 (0.01)	0.001 (0.77)
Executive constraints x tertiary education spending	-0.001*** (2.85)	-0.001** (2.03)	-0.003* (1.66)
Initial income level	-0.001*** (2.87)	-0.001** (2.23)	-0.001*** (2.18)
Budget balance	0.001 (0.05)	0.012 (0.95)	0.045 (1.47)
Inflation rate	-0.000 (0.09)	-0.000 (0.41)	-0.003** (2.48)
Observations	164	159	115
R-squared	0.4466		0.5306
Test for endogeneity			
Durbin score			0.8973
Wu-Hausman			0.9250
Test for overidentification restrictions			
Sargan score			0.1054
Basmann			0.1417
Prob > F	0.0000	0.0000	0.0000

Notes: The dependent variable is measured as 5-year, forward moving averages of the annual growth rate of GDP and all control variables are measured as annual observations (see Table 3.2). Our estimators are OLS with white-corrected standard errors, FGLS correcting for heteroscedasticity and autocorrelation and 2SLS. Time-fixed effects which are included where appropriate to reduce potential bias caused by omitted variables (Temple, 1999). Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

The estimated coefficients on the interaction term between each of the shares of education spending and constraints on the executive emerge with ambiguous and insignificant signs. The results are negative on primary and tertiary education spending, and positive but statistically insignificant on secondary. These results may suggest that executive constraints may be an imperfect measure of the quality of the institutions or that its effect cannot be properly estimated since it does not often change. These estimates are counterintuitive but not surprising, for example Lopez and Miller (2007) fail to establish a systematic correlation between institutions of governance (using corruption as a measure) and spending efficiency across sectors. An important issue in relation to these findings is that they do not necessarily imply that improvements in the quality of institutions will have greater effects on the effectiveness of public spending on growth. The challenge for the cross-country analysis, data on factors that are likely to have a direct impact on the effectiveness of spending such as leakages in the flow of public funds towards the targeted beneficiaries, misallocation of resources due to lack of administrative capacity, are not readily available on a large and

comparable basis. Even though spending on education has a high growth elasticity, it is realistic that results such as these can emerge if in practice resources allocated towards education are hardly spent on actual educational programmes. These unobserved heterogeneities are better analysed in country-focussed studies. We attempt to gain a better understanding of some of the institutional characteristics, which are not clear in cross-country findings, which can influence the efficiency of public spending in bolstering long-run economic growth by examining a country case of Zambia in the final section of this chapter.

Other interesting results from this analysis, which we consider as part of the robustness check on our earlier findings, include a consistent finding that sectoral composition of educational spending does not seem to matter for growth in Africa. The other is that even under this new formulation of the growth model we are unable to find evidence of the World Bank's conventional wisdom that emphasises primary education in low-income countries. The estimated coefficients of the sectoral composition and our measures of educational human capital quantity (school enrolment rates) remain statistically insignificant across all our three estimators, but more importantly even in our instrumental variable estimator (2SLS). More fundamentally, the results continue to show overwhelming evidence for the positive and direct role of the quality of educational human capital (measured by repeater rates) and institutions in promoting economic growth. However, it should be noted that although the 2SLS technique is widely used in growth regressions, as reported in Table 3.3, there may be some imperfections in the findings due to the possibility of weak instruments (lags of endogenous variables with a few external instruments). The use of this estimation technique here should therefore be seen as an attempt to test the sensitivity of our key findings, and indeed these appear to be remarkably consistent: in table 3.7, the inflation rate is the only independent variable which is significant only in the 2SLS regressions. The 2SLS based results presented here have provided us with a robustness check on our OLS and FGLS estimators. It should also be noted that we have also employed another method as an attempt to minimise the effects of any endogeneity, the use of forward lags of the dependent variable as discussed earlier.

We now present and discuss the findings on the impact of democratic accountability and bureaucratic effectiveness on the link between public spending on education and economic growth. On bureaucratic effectiveness regressions the results reported in Table 3.8 the estimated coefficients on the three interaction terms are positive and statistically significant, thereby supporting our basic hypothesis education spending at all the three levels of education

is more effective in promoting economic growth in countries with strong and well-functioning bureaucratic institutions. This finding is fairly consistent with other studies on public expenditure and growth. Our alternative measure of institutional quality, democratic accountability, although emerges as a strong predictor of growth in Table 3.7, it does not propel public spending into generating higher growth rates. the estimated coefficients on the interaction terms between democratic accountability and the three levels of education spending emerge statistically insignificant. As possible explanation is that some of the institutional variable rarely change in developing countries but also the small number of observations (146) may have an impact of the estimates. Therefore, we treat any conclusion based on these findings as cautious.

Table 3.8. Institutional factors and effectiveness of educational spending [democratic accountability and bureaucratic effectiveness]

Estimation method	**Robust OLS**	**Robust OLS**
Explanatory variables	**(8)**	**(9)**
Constant	-61.978 (1.350)	25.243 (0.830)
Physical investment (K)	0.005 (0.510)	0.010 (1.250)
Labour supply (L)	-0.391* (1.970)	-0.281*** (2.670)
Primary education spending	0.079 (1.260)	-0.046** (2.310)
Secondary education spending	0.079 (1.320)	-0.028 (1.360)
Tertiary education spending	0.093 (1.460)	-0.035 (1.560)
Repetition rates	-0.055*** (3.330)	-0.048*** (3.990)
Bureaucratic effectiveness	6.209** (2.090)	
Bureaucratic effectiveness x primary expenditure	0.064** (2.020)	
Bureaucratic effectiveness x secondary expenditure	0.060* (1.930)	
Bureaucratic effectiveness x tertiary expenditure	0.065** (2.080)	
Democratic accountability		-0.301 (1.270)
Democratic accountability x primary expenditure		0.003 (1.070)
Democratic accountability x secondary expenditure		0.003 (1.250)
Democratic accountability x tertiary expenditure		0.004 (1.280)
Budget balance	0.039***	0.014

	(2.860)	(1.030)
year	0.028 (1.180)	-0.010 (0.640)
Observations	146	227
R-squared	0.3485	0.2530
Prob > F	0.0000	0.0000

Notes: The dependent variable is measured as 5-year forward moving averages of the annual growth rate of GDP and all control variables are measured as annual observations (see Table 3.2). Our estimator is OLS with white-corrected standard errors. Time-fixed effects which are included to reduce potential bias caused by omitted variables (Temple, 1999). Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

Based on the results presented in this section, our main finding suggests that the weak link between spending and growth is a feature of the different institutional environments in which education systems operate. Environments with higher bureaucratic effectiveness are more likely to use resources more effectively to raise human capital and thence growth. Education spending seems to be more effective in promoting growth in countries with better bureaucratic effectiveness than the level of democratic accountability and constraints on the executive. However, these findings should be treated with caution given that indicators of institutional quality rarely change in Africa (as will be seen in the case study) and also the ones we have employed here only capture particular dimensions rather than all aspects of institutional quality.

3.5.3 Possible determinants of educational quality

Until this point, we have analysed the impact of the quality of education and concluded that it matters even more than the quantity dimension in the growth process and should, therefore, be a central part of development strategies. As mentioned earlier, the World Bank has also shifted its emphasis from expansion of school enrolments to quality of education – actual learning and acquiring skills (World Bank, 2018). While we have found some evidence, based on repletion rates as our measure of quality in this study and test scores in science, maths and reading in other studies, not much is completely understood about what drives the quality of education. More fundamentally, a crucial issue which we hope to shed some light on is whether the rapid expansion of school enrolments such as those promoted in low-income countries, might have contributed to a stagnation or even fall in the quality of education, and could probably explain its lack of growth effects. Although this seems to be the case in South Africa where van der Berg (2007) shows that policies that led to expansion of education access for black students after apartheid (both by the allocation of more resources to black schools and increasing enrolments for black students across the country) did not close the student

achievement gaps between black and white students after a decade, it is not known to what extent such policies have affected the quality of education in the African context.

In this section we attempt to present a simple framework which may be used to approximate determinants of the quality of education. We focus on some factors which have been identified in the literature to have a direct or indirect association with learning outcomes. Our aim is to contribute to the debate on whether development policies which focussed on enrolments might have had unintended consequences on the quality of education as observed in South Africa by van der Berg (2007) and other low-income countries by the World Bank (World Bank, 2018). This approach departs from the standard ones which have focussed on assessing the impact of education policies on access to education (quantity) mainly through increasing school enrolments. These studies have also ignored an important aspect of these policies (expansion of schooling) which that such policies might have led to excessively fast growth in school enrolment rates, but which are not matched by a proportionate increase in resources, leading to a deterioration in learning conditions and an ultimate decline in the quality of education. This is one possible explanation why education measured by enrolments does not appear to be correlated with growth. As mentioned above, van der Berg (2007) shows for South Africa that expansion of access to education for blacks in South Africa did very little to close gaps in learning achievements between black and white students, all things considered. The 2018 *World Development Report* argues that the massive expansion of schooling in low-income countries has been nothing short of impressive over the past five decades, with few parallels in history and globally but it has left millions of pupils behind – learning outcomes have remained low – but offers little empirical explanations why millions of children with more access to schooling than before have been left behind. Answers to this question can have important policy significance in helping low-income countries target better national development policies towards more effective programmes and activities.

An important implication of the expansion of school enrolments is that, for any given level of efficiency, the quality of education may fall if excessive growth of school enrolments is not matched by an appropriate increase in resources. An excessive growth in enrolments, which is not matched by additional resources, can lead to poor learning conditions such as overcrowding in classrooms, insufficient provision of learning and teaching materials (textbooks and sanitation facilities), overworking of teaching staff which can lead to limited or absence of attention provided to individual learners (pupils), shortage of classrooms, all of

which are central to learning and achievement of educational outcomes. Therefore, to maintain the quality of education, expansion of school enrolments should be accompanied by more resources for investments in teaching and learning materials, training and deployment of more teachers and provision of appropriate infrastructure. In studying this issue, a cross-country implication is that, as the number of pupils enrolled in schools increases and that their educational achievements will be influenced by the existence of a conducive learning environment, we expect that in countries where massive expansion of access is not supported by an increase in resources the quality of education will be lower.

To try and capture the extent to which governments provide resources to maintain the quality of education, we include total public spending on education as a share of total expenditure. We also include an indicator of the quality of institutions to measure government's strength and expertise to govern without drastic changes in policy or interruptions to government services, to capture the ability of the government to maintain educational efficiency, which in turn influences educational quality. Two indicators of institutional quality are relevant and are added to the right-hand side of the model - '*constraints on the executive'* and '*bureaucratic effectiveness'*. To capture systematic changes which happen overtime in factors such as nutritional status of pupils, grading standards on the examinations, distributional of schools, management styles and other variables not included in our model (mainly for lack of data), we include the time dummies as regressors. Also, as an additional indicator to capture the schooling and learning conditions which matters for the quality of education, our indicator is the pupil-to-teacher ratio (PTR), measured as the average number of pupils per teacher in primary school. Higher absolute values of the PTR denote a deterioration in schooling and learning conditions. The data for this variable is obtained from the World Development Indicators (2018).

Our empirical strategy to test this hypothesis draws upon the methodology used by Duraisamy *et al*. (1997) who examine a possible trade-off between quantity and quality as a result of an increase in enrolments in India, Baldacci *et al*. (2003) who analyse the drivers of educational quantity, Rajkumar and Swaroop (2008) who examine the link between primary education and public spending and others and specify an estimating model of the following linear functional form:

$$H_{it}^{2} = \beta_0 + \beta_1 H_{it}^{1} + \beta_2 P_{it}^{o} + \beta_3 PTR_{it} + \beta_4 I_{it} + \lambda_t + \varepsilon_{it} \quad (3.6)$$

where our dependent variable (H_{it}^{2}), is measured as 5-year forward moving average of repletion rates measured as the percentage of students who are forced to repeat grades at all levels of primary education (as before), P_{it}^{0}, is the share of public expenditure on education in total public spending, which measures how much the government allocates towards the education sector, PTR_{it} is the ratio of the number of pupils to one teacher, our indicator of the schooling conditions, and the rest of the variables are as defined before. The regressions also incorporated country- and time-specific fixed effects to account for unobservable heterogeneity and also to minimise a possible problem of omitted variable bias. One potential limitation of this approach was our inability to account for individuals' attributes (such as parents' education, IQ scores, etc) in a cross-country set up.

The parameter of primary interest in this estimation equation is β_1, the coefficient on the variable which measures primary school enrolment rates (defined net of repetition rates). If our hypothesis that expansion of school enrolments may have adversely impacted education quality is true, the estimated value of β is expected to be positive (because of the inverse measurement of quality). This relationship has policy relevance for low-income countries, which have emphasised development policies that favour enrolments over quality. Like we have stated on public spending on education, the policy implication in studying this relationship is that although increasing schooling is critical for growth, merely expanding school enrolment rates may not be enough to achieve this objective, improving the quality of learning may be central as well.

The regression results for equation 3.6 are displayed in Table 3.9. In columns (10) and (11) we focus on the role of expansion of primary school enrolment, changes in school and learning conditions, the quantity of resources provided to maintain the quality of education and the role of institutions in maintaining educational efficiency and quality of education. In columns (12) and (13), we provide an alternative specification in which we assess an alternative measure of institutional quality 'bureaucratic effectiveness' and the rest of the variables of interest. The last two columns, (14) and (15), present findings when both measures of institutional quality are included, plus the rest of the variables, to assess the robustness of our findings.

Table 3.9. Possible determinants of education quality [equation 3.6]

Estimation method	OLS	FGLS	OLS	FGLS	OLS	FGLS
Explanatory variables	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Constant	-14.29*** (3.22)	-8.22* (1.73)	-18.71*** (6.05)	-6.24 (1.090)	-16.06*** (4.820)	-5.003 (0.740)
Primary school enrolment	0.107*** (4.000)	0.062** (2.140)	0.177*** (6.590)	0.086*** (2.650)	0.167*** (6.020)	0.085** (2.380)
Total expenditure on education	0.101 (0.820)	0.073 (0.540)	0.049 (0.390)	0.102 (0.610)	0.031 (0.250)	-.0129 (0.74)
Pupil-to-teacher ratio	0.356*** (7.340)	0.378*** (6.910)	0.235*** (3.450)	0.355*** (4.380)	0.194** (2.420)	0.367*** (4.000)
Executive constraints	0.090 (0.230)	-0.089 (0.250)			-0.251 (0.520)	-0.376 (0.680)
Bureaucratic effectiveness			-3.723*** (4.55)	-1.616 (1.080)	-4.205*** (4.700)	-1.185 (1.030)
Observations	149	149	101	101	94	94
R-squared	0.4518		0.5471		0.5740	
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: The dependent variable is the 5-year average of repetition rates at primary level. White-corrected standard errors are in parentheses. Time-fixed effects which are expected to affect growth are included where appropriate to reduce potential problems of omitted variables (Temple, 1999). All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

Our results across the different specifications as reported in Table 3.9 indicate that, holding other things constant, expansion of primary school enrolments is negatively correlated with educational quality[37]. The estimated coefficient suggests that every 1 percentage point increase in the rate of primary school enrolments, leads to a fall in the quality of education by between 0.06 and 0.18 percentage points. In other words, the proportion of pupils who are forced to repeat grades at all levels of primary education increases by between 0.06 and 0.18 percentage points for each percentage point increase in enrolments. This finding has important policy implications, that growth-promoting strategies which have focussed on expanding access to education in low-income countries have been successful at getting more children in schools, yet these policies may have compromised the quality of educational human capital.

Our results also appear to suggest that public resources allocated to the education sector have not contributed to maintaining or improving the quality of education in low-income countries. The estimated coefficient indicates that public spending has a negative impact on the quality of education although this effect is not statistically significant. This ambivalent finding could perhaps arise from the possibility that annual public spending on education has not matched with the spending requirements for the excessive growth in school enrolments or

[37] Note that our educational quality indicator, repeater rates, rises as educational quality deteriorates therefore, larger classes and larger enrolments, as in Table 3.7, are associated with a significantly higher repeater rate and thus a lower quality of education.

resources allocated to the educational sector have not been effectively used to maintain educational quality.

The next issue we examine is the impact of changes in learning conditions on the quality of education. As documented by the World Bank (1997: p.2), because education systems in low-income countries always depend heavily on public resources, and because of severe budgetary constraints, rapid and sustained expansion of enrolments leads to sharp declines in schooling and learning conditions. Assessing whether this in turn has had a negative impact on the quality of education, our regression results provide strong evidence that schooling conditions measured by pupil-teacher ratios are negatively correlated with the proportion of pupils who repeat grades at primary education level. The estimated coefficient suggests that a 1 percentage point reduction in pupil-teacher ratio is associated with an increase of between 0.19 and 0.38 percentage points in the number of repeaters.

Finally, our results from this analysis indicate that improving conditions of learning such as the pupil-teacher ratio, in addition to other complementary inputs like provision of learning and teaching materials, and improving the quality of institutions, especially bureaucratic effectiveness, can contribute towards better quality of education. These preliminary findings also point to the possibility that policies that have strongly focussed on expansion of school enrolments may have compromised quality, confirming the scepticism about education quantity expressed by the World Bank's 2018 World Development Report.

3.5.4 Robustness checks

To check the robustness of the results obtained in the previous section, particularly the findings on the differential effects of the shares of primary, secondary and tertiary education spending, the importance of quality of education in understanding the impact of education and the role of institutions of governance in this process, we introduce year-dummies into equation 3.4 to capture time-specific fixed effects, whose exclusion in our earlier estimations may have led to omitted variable bias. The results are reported in columns (16), (17) and (18) of Table 3.10. Equation 3.4 is also re-estimated by examining how the estimated coefficients on the variables of interest behave when time-specific fixed effects, a different measure of institutional quality is employed (constraints on the executive) and also accounting for the macroeconomic environment, proxied by the annual rate of inflation. The findings from a

modified specification that incorporates these factors are reported in columns (19), (20) and (21). Given the surprising nature of the results of some of our key variables, we also conduct further robustness checks by dropping one set of education variables, in particular enrolments, to assess whether the coefficients on the other variables are affected. These tests are not formal but are based on our view that there could be a problem of multicollinearity. The re-estimations of the affected variables are reported in Table 3.8 and Appendix 3.3. As can be noted, the main results on these variables of interest are not sensitive to the different specifications and, thus, our conclusions do not change but remain substantially similar to those reported in Tables 3.6, 3.7 and 3.8.

Table 3.10. Robustness checks of key explanatory variables

Estimation method	**OLS**	**FGLS**	**2SLS**	**OLS**	**FGLS**	**2SLS**
Independent variables	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**	**(21)**
Constant	3.551	3.212	6.243	3.907		5.397
	(1.07)	(1.27)	(0.93)	1.19		(0.81)
Physical investment (K)	0.051**	0.037***	0.046*	0.051**	0.035***	0.045*
	(2.32)	(3.09)	(1.93)	(2.33)	(2.94)	(1.91)
Labour supply (L)	-0.624**	-0.321	-1.228**	-0.630**	-0.332	-1.353***
	(2.17)	(1.42)	(2.52)	(2.21)	(1.46)	(2.85)
Public spending on primary education	-0.044	-0.027	-0.051	-0.047	-0.030	-0.038
	(1.15)	(1.28)	(0.80)	(1.24)	(1.40)	(0.59)
Public spending on secondary education	0.023	0.016	0.014	0.026	0.018	0.024
	(0.610)	(0.71)	(0.19)	(0.67)	(0.81)	(0.34)
Public spending on tertiary education	-0.009	-0.002	-0.004	-0.018	-0.008	0.022
	(0.24)	(0.09)	(0.07)	(0.48)	(0.35)	(0.37)
Primary school enrolment rates	0.010	0.019**	0.007	0.009	0.021***	0.006
	(0.86)	(2.59)	(0.61)	(0.76)	(2.72)	(0.51)
Secondary school enrolment rates	-0.006	0.014	-0.015	-0.006	0.017	-0.018
	(0.40)	(1.17)	(0.72)	(0.38)	(1.42)	(0.88)
Tertiary school enrolment rates	-0.010	-0.012	-0.029	-0.015	-0.011	-0.016
	(0.29)	(0.48)	(0.71)	(0.42)	(0.40)	(0.41)
Human capital quality (repeaters)	-0.087**	-0.116***	-0.085**	-0.087**	-0.122***	-0.082**
	(2.47)	(5.74)	(2.52)	(2.48)	(6.16)	(2.48)
Democratic accountability	0.027**	0.019***	0.048***			
	(2.42)	(2.98)	(3.20)			
Constraints on executive actions				0.032***	0.021***	0.058***
				(2.88)	(3.26)	(3.89)
Initial level of income	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(2.95)	(3.44)	(3.51)	(2.98)	(3.71)	(3.72)
Budget balance	-0.009	-0.008	0.047	-0.016	-0.008	0.052
	(0.26)	(0.63)	(1.36)	(0.50)	(0.66)	(1.49)
Inflation rate				0.001*	0.001	-0.002
				(1.72)	(0.69)	(1.57)
Year dummies	YES	YES	YES	YES	YES	YES
Observations	164	159	115	164	159	115
R-squared	0.4631		0.5441	0.4767		0.5638
Prob > F	0.0000	0.0000	0.0000		0.0000	0.0000
Endogeneity tests						

Durbin score			0.693			0.6855
Wu-Hausman			0.822			0.8199
Tests of overidentifying restrictions						
Sargan			0.737			0.5158
Basmann			0.8099			0.6349

Notes: The dependent variable is measured as 5-year forward moving averages of the annual growth rate of GDP and all control variables are measured as annual observations (see Table 3.2). Our estimators are OLS with white-corrected standard errors, FGLS correcting for heteroscedasticity and autocorrelation and 2SLS. Time-fixed effects which are included where appropriate to reduce potential bias caused by omitted variables (Temple, 1999). All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

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3.6 Qualitative Results: Zambia case study

The quantitative analysis we have conducted in the previous section indicates that there is a weak link between investment in human capital as measured by common indicators, in particular school enrolments including public spending on education (whether as aggregate measures or shares of public spending on primary, secondary and tertiary levels). We have explored the importance of the quality of education for growth and further developed in section 3.5.3 in relation to its drivers, albeit the current findings are very tentative. Several suggestions have been made to shed some light on the causes of the weak correlations but at macro level studies are not unanimous on the causes of the low education impact, making it difficult to draw robust policy conclusions, as much depends on country-specific situations which go beyond the econometric findings. Our aim in this section is to try and add a detailed country-specific situation and gain more insights into the causal factors which may underlie the low education impact as suggested by our regression analysis, by examining a case study of Zambia. As indicated earlier, in this section we adopt a different approach mainly based on qualitative analysis using data from interviews conducted with officials in government ministries, national assembly (parliament) and office of the Auditor General, and a review of several publicly available policy and budgetary documents provided by the Cabinet Office, ministries of finance (MoF) and general education (MoGE), Central Statistical Office (CSO) and the World Bank Zambia office, during the periods 11-29 June 2018 and 7-21 January 2019.

Zambia falls in the lower middle-income range of the World Bank's classification of countries based on income levels, with per capita income that has averaged about US$1,523 since 2010s and is a mineral dependent country. In terms of the performance of the economy, our focus in this study, this has generally improved in the last three decades, with the average per capita GDP growth rate increasing from the negative performance of -1.7 percent and -1.4

percent in the 1980s and 1990s respectively, to an annual average of 4 percent in the 2000s before declining to 2.3 percent per year since 2010. The lack of significant growth in per capita real GDP has happened in spite of religiously implementing development strategies that focussed on improving education. As can be observed from Table 3.11, Zambia has shown increasing willingness to invest in education since independence: school enrolments have increased considerably since the 1970s, especially at primary level in comparison to secondary and tertiary, in line with World Bank conventional wisdom of prioritising primary education; Public expenditure on education, as a share of the national budget, has been favourable (increased between 1970s and 1980s but fell to 9.2 percent during the economic crisis of the 1990s but has improved to an average of almost 20 percent since 2010, the largest single share of the national budget (according to the *World Development Indicators,* the African average is 16.5 percent since 2010). These patterns in school enrolments and public expenditure on education suggest that Zambia has been willing to invest in education to promote economic development. The country has also experienced progression in terms of institutions of governances with the spread of democratic practice, increased constraints on the executive but very minimal improvements in bureaucratic effectiveness, as can be observed at the bottom of Table 3.11.

According to ‘endogenous growth theory, investment in education is expected to lead to a higher rate of economic growth. In Zambia, in spite of government increased investment in education and a more favourable political environment, the quality of education (as measured by the *repetition rates*) has fallen from 1.7 percent in the 1970s to 5.7 percent since 2010. Figure 3.3 shows that the growth rate of per capita real GDP (economic growth rate) remained low during the 1970s up to the 1990s, albeit being significantly unstable, improved markedly during the 2000s but has been falling since 2010. These findings the qualitative approach appear to confirm our findings from the quantitative analysis, in particular that investment in education does not necessarily lead to better economic conditions. The objective here is to identify causal factors which may help to explain why the relationship is often weak.

Table 3.11: Zambia. Trends in major educational and governance indicators

	10-year averages				
School enrolments (% of population age group)	**1970s**	**1980s**	**1990s**	**2000s**	**Since 2010**
Primary school enrolments	91.0	94.6	85.8	98.8	105.4
Secondary school enrolments	14.5	17.8	20.3		
Tertiary school enrolments	1.4	1.7	2.2		4.0
Education quality					
Proportion of repeaters at primary (% of students enrolled in primary school)	1.7	1.7	4.4	6.6	5.7
Public expenditure on education					
Educational expenditure (% of budget)	21.3	28.6	9.2	10.6	19.7
Shares of expenditure (% of educational spending)					
Primary level	40.6	40.8	38.0	59.5	
Secondary level	33.4	33.4	17.8	17.9	
Tertiary level	16.8	16.4	23.4	21.1	
Institutional quality (units)					
Democratic accountability (Polity IV)	0	0	4	5	7
Constraints on the executive	0	1	5	5	5
Bureaucratic quality (government effectiveness)	-	-	-1.00	-0.82	-0.60

Source: World Development Indicators (2018), Polity IV database and World Bank Governance Indicators (2018) Note: All our institutional variables are based on public perception scores: democratic accountability is measured on scale of -10 (very weak democratic accountability) and +10 (very strong democratic accountability); constraints on the executive on a scale of 0 (very weak restrictions of decision-making powers) and 7 (very strong restrictions) and bureaucratic quality on scale of 0 (very poor capacity for policy formulation and implementation) and 4 (very strong capacity).

We suggest that this is due to three factors. In Zambia, as in many countries in Africa: 1) public spending on education is sub-optimally allocated and is not adequately rationalised to make a positive contribution to effectively to human capital accumulation (learning); 2) education policies have emphasised school enrolments (quantity) which matters less than the more potent education quality; and 3) institutional reforms have not provided a robust environment which can sufficiently propel education spending to generate human capital and economic growth.

As mentioned earlier, the government in Zambia has have followed the World Bank's conventional wisdom[38], by increasingly allocating more fiscal resources towards the education

[38] The World Bank has often supported, through its lending programmes in low-income countries, policies which stress investment in education, especially primary level (*World Development Reports* 1991; 2018).

sector with most of them being spent on primary education (see Table 3.11). Public spending on primary and secondary levels of education, which between them constitute over 70 percent of the entire allocation to the education sector, is allocated along three broad categories: 1) staff and teacher salaries; 2) grants to schools for education materials; and 3) capital spending for construction and upgrading of school infrastructure. A review of the budgetary allocations and financing towards these education inputs suggests there are serious structural imbalances which have lived on from independence. Increasingly, a disproportionately large share of public funds allocated to education, averaging about 70 percent between 1980 and 2017, is devoted to staff and teacher salaries, and too little is left for purposes that are central to education but cannot be undertaken without the provision of funds. There have been very limited efforts made since the 1970s to break this structural imbalance in resource allocation. What is even more disturbing is that a large part of the increments to education spending over the past several years have been utilised to improve teacher salaries and employ more teachers. This is similar to what the World Bank has found in other developing countries where "teacher salaries absorb more than 80 percent of education budgets" (World Development Report, 2018: p.173). Because very little is devoted to inputs that are strong predictors of human capital accumulation (student learning), coupled with massive expansion of school enrolments, there have been serious shortages of complementary inputs like textbooks, teaching and learning materials, libraries and other learning materials for several years. Partly as a result of poor allocation of public funds, in Zambia it is estimated that five students at primary school level share less than one textbook for each subject, five students at secondary level share between 1 and 1.5 textbooks (World Bank: Zambia PETS[39], 2015: p.4). Thus, these imbalances have certainly contributed in undermining improvements in the quality of education, which according to our analysis is an important determinant of the growth rate of an economy. It is, therefore, not unreasonable to expect public spending on education in a low-income country like Zambia to have little positive impact on growth when allocations are biased against expenditure on key educational inputs that directly affect student learning, and thus human capital development. It is also the case in Zambia and other developing countries that education may have a weak link with economic growth because of the low demand for human capital due to lack of private sector dynamism which has led to no jobs for educated workers.

[39] PETS is the World Banks Expenditure Tracking and Service Delivery Survey conducted for Zambia in 2015)

The second issue we wish to consider is the quantity versus quantity. Our quantitative findings indicate that the quality of education is a more potent as a driver of economic growth than the quantity (enrolments). In Zambia, as in many low-income countries, government policies have put strong emphasis on schooling and access to education and most of the policies implemented since the 1960s have placed undue focus on enrolments. At independence on 24th October 1964, Zambia inherited a relatively "weak educational profile with just about 100 university level graduates, under 1,000 people with secondary school level education" and more than half of the population of about three-and-a-half million aged below 15 years with no access to education (Musambachime, 1990: p.82). The government recognised early on that the new country was not adequately prepared to meet the development challenges of the post-colonial era and placed the expansion of education high on the list of priorities. Investment in formal education was thus seen as a means through which requisite skills, competences and abilities necessary to foster economic development could be developed. In its various development plans and other development strategies the government emphasised access to education as key to economic development. For instance, the Transitional National Development Plan (1965) emphasised universal primary education, the First (1966-70) and Second (1972-76) National Development Plans placed emphasis on increased enrolments at all levels of education, and in the Fourth National Development Plan (1989-93) this policy goal was clearly captured by the following caption:

"*[I]ncreasing access to education will remain a priority because the government attaches great importance to education due to its central role as a means of imparting the skills needed for national development" (GRZ, 1989: p.298).*

Other key policy reforms within the sector have included the abolition of racial segregation in schools, introduction of free education, rapid expansion of education infrastructure and training and recruitment of teachers. These reforms were made possible by a favourable economic environment due to favourable copper prices (the country's main foreign exchange earner). As reported in Table 3.11, the emphasis on investments in education in Zambia, supported by the growth in government expenditure on education, have resulted in improvements in some of the quantitative indicators such as school enrolments rates and improved school infrastructure and the number of teachers. However, student learning outcomes (here measured by *repetition rates*), which according to our econometric analysis matter for the quality of education and human capital accumulation, and a strong predictor of

economic growth, have deteriorated and remained persistently low since the 1970s. This is evident in both national patterns as well as student test scores. The data shows that the quality of education, measured by *repetition rates*, declined from an average of 1.7 percent in the 1980s, reaching its peak of 6.6 percent in the 2000s before improving slightly to 5.7 percent since 2010. Student learning measured by the results in national learning assessment in math, English and science at grade 5 and 9 with all scores falling below the benchmark score of 40 percent in the period 1999-2014. The expansion in school enrolments particularly after the 1980s appear to have coincided with the deterioration in quality (see Table 3.11), which is consistent with our preliminary findings in section 3.5.3: that in Africa the massive expansion in school enrolments may have compromised the quality of education and human capital accumulation, which on our analysis negatively affects growth. The picture that emerges from student scores based on cross-country tests also shows similarly worrying patterns of low quality of education. For instance, there has been no improvement in student scores in English, maths, science and the country's local languages at grades 5 and 9, with the average scores falling below the benchmark passing score of 40 percent. Between 1999 and 2014 national scores in maths increased marginally from 34.3 percent to 35.3, while for English score fell from 33.2 percent to 31.4 percent (World Bank, 2015). The *Southern and Eastern Africa Consortium for Monitoring Educational Quality*[40] ranked Zambia as the second lowest on student achievement in 2007, and this has not changed as confirmed by the World Bank's 2015 *Educational Sector Public Expenditure Tracking and Service Delivery Survey in Zambia* report (World Bank, 2015).

Many respondents interviewed for this study do not see Zambia having suitable policies that are conducive for improving the quality of education. Apart from the negative effects of poor resource allocation and utilisation, and massive expansion other factors brought to the fore during our interviews (as possible causes of the weak link between spending, quality and growth) included weak implementation of policies and management of public resources which undermines the effectiveness of the education policies. In spite of the presence of approved policies and spending allocations such as grants to schools for education activities to ensure student learning, this is undermined by schools that are supposed to receive school grants from the government not receiving the grants in full. For instance, 30 percent of schools did not

[40] The Southern and Eastern Africa Consortium for Monitoring Educational Quality is an association of 16 African ministries of education established in 1993 as a research and training institution, to monitor and assess educational quality, and provide policy-based research advice to member states.

receive any government school grants to support the free primary education policy in 2013 (World Bank, 2015). This is exacerbated by schools often being unaware of how much they are supposed to receive, and weak or poorly functioning institutions of governance. Several reports, including the Auditor General's reports for various financial years, have also shown that the link between education spending and outcomes has been broken because funds have not reached the targeted schools and have not been spent on intended education activities. When funds are diverted from education activities that are central to student learning this can have significant implications for human capital accumulation. For instance, although the full amount budgeted for textbooks in 2013 of K42 million was funded to the ministry of Education in Zambia, actual spending was reported as K8 million significantly lower than the amount budgeted because funds were partly diverted to procure vehicles and furniture for the newly appointed minister and other senior officials (MoE, 2016; World Bank, 2015).

The 2016 report of the Zambian Auditor General claims that misapplication of public funds has been a major cause of financial leakages and has been on the rise since the 1990s. Reports for the period 2010-2016, show that in Zambia almost one-third of the grants allocated mostly to rural primary schools including funds for school operations were diverted towards district operations. The report also highlights significant failure to follow procurement procedures, failure to account for public funds and delays in implementing projects as the top three causes of poor performance in the MoE. The World Bank's 2016 Education Sector Public Expenditure Tracking and Service Delivery Survey in Zambia reports that 28 percent of primary schools and 70 percent of secondary schools reported having not received a school grant between 2013 and 2014. The report further shows that in addition to delays or failed delivery of school grants, many schools experience shortages of textbooks, desks and chairs, staff, and building maintenance, and of these issues, textbook shortages are the most serious in Zambia. It is, therefore, possible to find no association between education expenditure, human capital and economic growth under these circumstances, simply because public resources are not used on education activities, and thus fail to contribute towards student learning. This is a micro-level illustration of the well-documented problem of fungibility of spending (see for example, Devarajan and Swaroop, 1998). However, to fully develop this element of the story goes beyond the scope of this thesis.

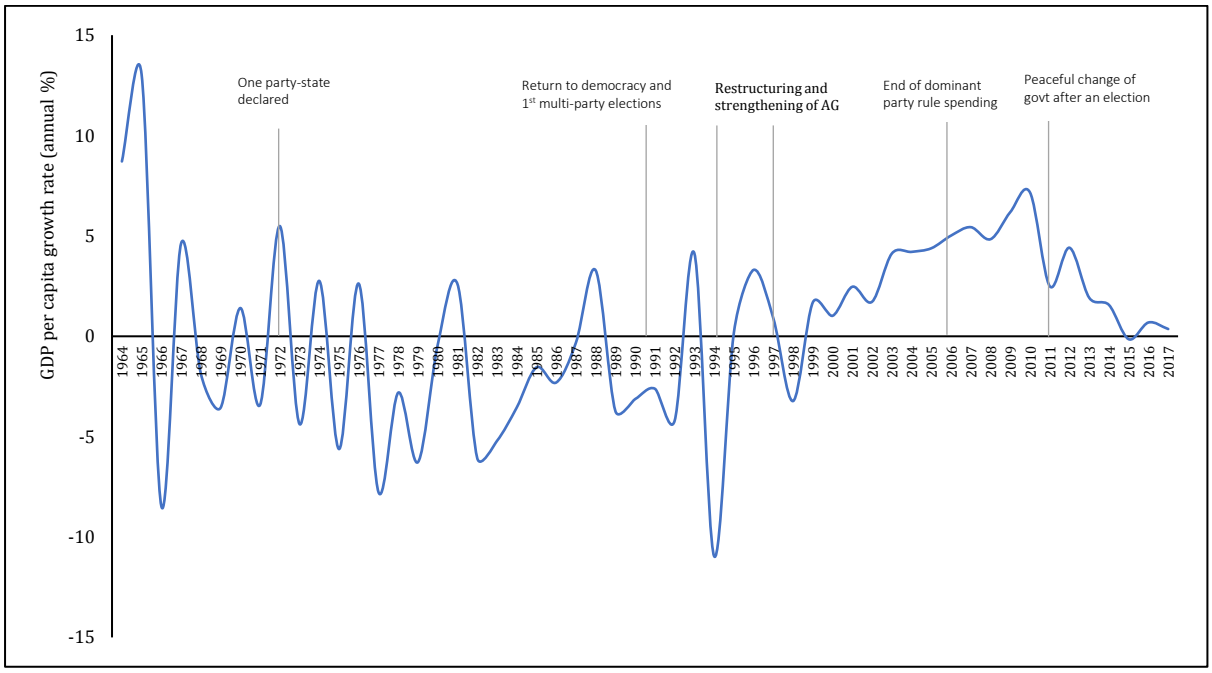
The final issue requiring further discussion in the context of low education impact in Zambia is the role of institutions. We shall focus here on the impact of institutions created to

promote policymakers' accountability, leaving on one side the broader measures of institutional quality examined earlier in the chapter. Since the beginning of the structural adjustment process in the 1980s, it has been an argument of reformers – and the World Bank in particular – that strengthening institutions that promote accountability is key to improve the effectiveness of macroeconomic policies (World Bank, 2003). Zambia has made effort in creating institutions of governance aimed at ensuring that there is prudent and effective utilisation of public resources. These reform initiatives, supported by aid donors and have also sprung up all over Africa and have involved entrenching the powers to ensure public accountability in the utilisation of public funds, in offices such the Auditor General (AG) and Public Accounts Committees of Parliament (PAC), among other institutions. Aid donors and civil society organisations expect that these institutions would be effective in ensuring accountability on policymakers and have a significant positive impact directly on economic performance or indirectly through their impact on the effectiveness of public expenditure. Our econometric evidence has consistently signalled that the quality of institutions has a direct positive effect on long run growth, but only bureaucratic effectiveness appears to propel the effectiveness of education expenditure in promoting long-run growth. Other forms of institutional governance like constraints on the executive, which the AG and PAC were created to represent emerge as insignificant drivers of public spending on education.

The mission of the AG, which draws its mandate from the Constitution of Zambia, is to "independently and objectively provide quality auditing services in order to assure our stakeholders that public resources are being used for national development and wellbeing of citizens." (http://www.ago.gov.zm/images/OAG_Strategic_plan.pdf). The AG was initially obliged by the Constitution to conduct annual audits since 1994 but its portfolio has expanded to include value for money or performance audits. However, there is very little evidence that the establishment and strengthening of AG and PAC has had any impact either on economic growth (as shown in Figure 3.3) or on the efficiency of public expenditure in Zambia. First, because the activities of these institutions on government accountability were initially very limited during the seventeen years of one-party rule (1972-91) because the one-party system created some institutional limitations due to the supremacy of the party in government – including limiting accountability, transparency and good governance. With progress in democratic practice it was that Zambia would adopt a much more democratic and transparent system of governance which would espouse the principle of accountability. In spite of being strengthened after 1991, the AG and PAC still remain deficient in the enforcement of effective

accountability because they lack a proper mechanism for sanctioning non-observance of accountability standards. Some commentators describe such shortcomings in the exercise of oversight responsibilities as institutional mechanisms for accountability that lack the means to ensure enforcement (Burnell, 2001; 2002). Thus, the attainment of multi-party rule has not delivered since 2001, in the territory of 'voice and accountability', the degree of institutional change that was hoped for, and the deterioration in the country's growth performance over the majority of years since dominant-party rule was replaced by multi-party government in 2006 may have something to do with this (see Figure 3.3).

Figure 3.3. Zambia: chronology of democratic changes and growth of GDP per capita (1964-2017)



Source: *World Development Indicators* (2018), freedomhouse.org, www.elections.org.zm

The common things which often come out of the AG and PAC reports, are much the same pictures of glaring financial irregularities in the public sector, but which are not followed up with sanctions for any misbehaviour. As a consequence, ministries have mustered the art of manipulating the financial system for private benefit or unproductive purposes because it's expected that they will not face any stringent sanctions beyond just being cited in the audit or parliamentary report. Specifically, for the MoE, PAC observed in 2017 that the financial report for the Ministry was the worst that PAC had witnessed in that year. The Ministry had applied funds meant for the implementation of key programme namely: early childhood education to unintended programmes. The AG lamented that the MoE lacked discipline and that it had a tendency of failing to produce documents required during audits. At political level, although

the Ministry of Finance has repeatedly promised to take a tougher line against erring ministries, there appears to have been very little effective action over the past few decades. More effective financial accountability could lead to improvements in policy outcomes, through reductions in misallocations, misuse and misappropriation of scarce public funds, however, for politicians with vested interests in retaining political power there are advantages in maintaining the status quo. This has severely compromised the control process.

In terms of other institutional reforms, in Zambia improvements in the country's political institutions by formal adoption of electoral competition has had little effect on policies because democratic rules are imperfectly respected and policy choices largely depend on patron-client relationships. Other institutional reforms have included, inter alia, civil service reforms to improve government bureaucratic efficiency and effectiveness, constitutional reforms aimed at strengthening the oversight role of Parliament and public sector financial reforms to promote accountability in the use of public resources. Thus, while a strengthening of the formal institutional mechanisms of accountability is necessary, in the case of Zambia we find some evidence that it may not be sufficient for the installation of greater financial accountability that is crucial in promoting the effectiveness of policy.

3.7 Conclusions

In this chapter, the objective was to understand whether investment in human capital, including public expenditure on education, is effective in promoting economic growth and how it can be improved since it has been given a place of pride in the theoretical literature by the 2018 *Nobel Prize* winner, Paul Romer, and other 'endogenous growth theory' advocates. The focus on education rather than on all human capital is because it is education that has been credited in the theoretical literature as a key element in human capital accumulation and therefore growth especially in developing countries. The international development community has encouraged developing countries to invest in education human capital because it has been considered one of the major "economically and socially productive investments". Thus, investment in education has been a central part of the development strategies of most developing countries

Although the rationale for the economic importance of investment education human capital is theoretically appealing, the empirical evidence on the growth impact of education has

been surprisingly weak. As can be observed from Table 3.3, there are as many studies reporting a negative or insignificant linkage between education and growth as there are those reporting a positive one. What is particularly disturbing is that studies that have properly analysed the robustness of the findings are sceptical in tone, suggesting that the original 'endogenous growth' hypothesis has severe difficulties defending its claims.

In this chapter, we examine the possibility that although aggregate measures of education spending may not emerge as significant correlates with growth, some of the categories of education spending may differentially affect growth as suggested by the World Bank and others. We also draw attention to an issue which has recently attracted international attention and debate – and has led to an apparent shift in World Bank policy on human capital from more enrolments to more learning – that the quality of education, which has been underexplored in the literature, is crucial for development. Our indicator of human capital quality (repetition rates) being used as the second-best option due to data limitations on other more ideal measures such as test results in our sample. The significance of this study is it could perhaps help low-income countries focus more of their scarce resources on development strategies that are more effective in buoying long-run growth and avoiding those that inappropriately drag growth down.

These ideas are tested empirically using a simple 'endogenous growth' framework on a sample of 42 African countries between 1980-2016. To make our results comparable to previous studies, we rely on the robust ordinary least squares, feasible generalised least squares (a variant of the GLS estimator) and the instrumental variable two-stage least squares estimators, with time- specific fixed effects where appropriate.

Our findings provide no evidence that increasing public spending on education and expanding school enrolments are associated with economic growth. Further, the analysis of disaggregated data on education spending levels could not validate the World Bank's conventional wisdom that prioritising primary over secondary and tertiary levels of education can be associated with higher per capita real GDP growth rate. Tentatively, public spending across all the three levels appears to be more effective in promoting growth in countries with higher bureaucratic effectiveness, but not democratic accountability or constraints on the executive. We find strong evidence that improving the quality of education provides a clear boost to economic development, much more than merely expanding school enrolments

suggesting that focussing on universal education is important, but not sufficient and must be complemented with the goal of improving quality. Our preliminary findings also point to the possibility that policies that have strongly focussed on expansion of school enrolments may have compromised quality, confirming the scepticism about education quantity expressed by the World Bank's 2018 World Development Report. The policy implication of this finding is that improving schooling conditions and strengthening institutions of governance can improve the quality of education and propel its growth effects.

More insights were gained into these issues by considering the case of Zambia, which shows that the government has followed development strategies promoted by development agencies (World Bank policy) since independence in 1964. Public expenditure on education has increased significantly since the 1990s and school enrolments, especially at primary level have expanded massively. However, the quality of education has remained persistently low and slowly declining, whereas the growth rate of per capita real GDP does not show a significant link to changes in education variables – perhaps confirming the apparent lack of association between spending, school enrolment and growth. Insights were also obtained on factors which may underlie the low education impact: inefficiencies in managing public resources, including disproportionate allocation of scarce resources to wages/salaries versus other educational inputs leading to widespread lack of the necessary teaching and learning materials; failure to send resources designated for specific areas to those areas.; and educational quality has been compromised by a failure to recognise that growth in enrolment cannot effectively deliver better learning unless complementary inputs such as teaching materials, additional teaching staff and maintenance of school buildings are delivered at the same time: a problem which in Zambia has been compounded by weak budgetary discipline and switching of such resources away from the areas to which they had been destined.

Appendix 3.1: Regression studies of human capital and educational expenditure as drivers of growth (selection)

Study	Sample and period	Education variable	Estimation method	Measurement of variables	Main finding
Educational human capital and growth					
1. Landau (1983)	96 countries 1961-72	Primary and secondary school enrolments; percent of 20-24-year-olds in higher education	Cross-section analysis OLS and 2SLS	Average annual growth rates	Growth is positively related to investment in education
2. McMahon (1987)	30 African countries (1970-85)	Primary, secondary and higher education	OLS	5-year time periods	Investment in primary and secondary education has a positive effect on growth
3. Romer (1989)	112 countries 1960-85	1960 level of literacy (initial level)	OLS and Instrumental Variables	Annual observations measured in current prices	Initial level of literacy predicts subsequent rate of investment, and indirectly, the growth rate
4. Azariadis and Drazen (1990)	71 low- and middle-income countries 1960-80	Literacy among the population above 10 years old	OLS	Annual observations measured in current prices	Literacy rates is positively related with growth in middle- and low-income countries, but not in high-income
5. Barro (1991)	98 countries 1960-85	1960 primary and secondary enrolment rates Pupil-teacher ratio (PTR)	OLS and weighted least squares	Annual average observations	Initial school enrolment rates (in 1960) are positively related with real per capita GDP growth rate PTR for primary has a negative relation, PTR for secondary is insignificantly related with growth
6. Mankiw *et al*. (1992)	3 samples (98, 75 and 22) countries 1960-85	Working-age population in secondary school (15-24 years)	OLS	Cross-sectional regression, data averaged over 1960-85	The measure of human capital accumulation enters positively and significantly in all three samples
7. Levine & Renelt (1992)	119 countries 1960-89	1960 primary and secondary enrolment rates	OLS and Extreme Bound Analysis	Cross-sectional data set	Out of 42 variables only 2 are robust and educational enrolments are none of the robust ones
8. Barro & Lee (1994)	85 countries 1965-85 95 countries 1975-85	Average years of secondary schooling	Seemingly unrelated regressions	10-year cross-sectional analysis	Male (female) secondary education has a positive (negative) effect
9. Benhabib & Spiegel (1994)	78 countries 1965-85	Average years of schooling of adults age 25+; adult literacy rate	OLS	Cross-section, data averaged over 1960-85	Human capital emerges insignificant and negative.
10. Barro and Sala-i-Martin (1995)	1960-2000	Male and female secondary and higher education,	Seemingly unrelated regression with country random effects	Cross-sectional analysis for 2 periods: 1965-75 and 1975-85	Male secondary and higher education positively impact growth
11. Durlauf & Johnson (1995)	98 countries 1960-85	Primary and secondary school enrolment rates; adult literacy rate (all measured at 1960)	OLS	Annual averages	The measure of human capital has a positive but insignificant coefficient
12. Lee & Lee (1995)	17 high-income countries 1970-85	1970 science scores of secondary school students, primary and secondary school enrolments	OLS	Cross-section, data averaged over 1970-85	Science scores have positive effect. Primary and secondary school enrolment rates are positive but insignificant.
13. Barro (1996)	100 countries 1960-90	Average years of schooling at secondary and higher school at start of each period	OLS and seemingly unrelated regressions	10-year averages for two periods and 5-year for one period	Male schooling at secondary and higher levels, but not at primary, predict economic growth. Female schooling at various levels is not significantly related to growth
14. Collins & Bosworth (1996)	88 countries 1960-94	1965 average years of schooling of adult population	OLS	Cross-section, data averaged over 1960-94	Schooling does not enter significantly in the regressions on its own
15. Easterly and Levine (1997)	African, Latin American and East Asian countries 1960-90	Average years of schooling at beginning of each decade	Seemingly unrelated regressions	10-year averages	Schooling has a positive and significant impact
16. Sala-i-Martin (1997)	1960-92	1960 primary school enrolment rate	OLS and Extreme Bounds Analysis	Cross-sectional regression	Primary school enrolment rates are not significantly correlated with growth
17. Kelly (1997)	73 countries 1970-89	School enrolment rates	OLS	Cross-section averaged over 1970-89	The coefficient on school enrolment variable is consistently positive but generally insignificant
18. Bloom, Cunning and Gupta (1998)	18 African and 59 non-African countries 1965-90	1995 years of secondary schooling	OLS	10-year averages over 1960-90	Direct effect of schooling on economic growth is insignificant
19. Bloom and Sachs (1998)	65 countries 1965-90	Years of secondary schooling	25-year cross-section		
20. McMahon (1998, 2000)	East Asian countries	1965 primary, secondary and tertiary gross enrolment rates		5-year average of growth rates	Primary and secondary impact positively and tertiary enrolment rates negatively

21. Temple (1999)	78 countries 1965-85	Average years of schooling	Least trimmed squares	Cross-section of averaged data for the period 1960-85	Strong correlation between increases in human capital and output growth
22. Bils & Klenow (2000)	93 countries 1960-90	Gross school enrolments and average years of schooling	OLS with White-corrected standard errors	Annual observations	Schooling explains less than one-third of economic growth
23. Hanushek &Kimko (2000)	31 countries 1960-80	Barro and Lee's average years of schooling (of adults age 25+) in 1960 Average score on internationally comparable math and science tests	OLS		Both education variables are significant when entered alone; only test scores are significant if both entered
24. Pritchett (2001)	1960-85	Average years of schooling of adults age 25+	OLS/IV	5-year averages	No effect of any education variables on GDP growth
25. Krueger & Lindahl (2001)	68 countries 1965-85	Change in years of schooling. Initial (1965) average years of schooling	OLS/IV	Cross-section with data averaged over the period 1965-85	Both initial education and change in education have significant and positive impacts
26. Stroup & Heckelman (2001)	44 African and Latin American countries 1975-89	Average years of adult male educational attainment	Fixed effects approach	5-year averages	Education has a positive effect on growth
27. Bassanini & Scarpetta (2001)	21 OECD countries 1971-98	Average years of education of the working age population			Positive and significant impact of human capital accumulation on output per capita growth
28. Hoeffler (2002)	1960-90	Average years of secondary schooling of adult males, age 25+	OLS and GMM 3SLS with IV	5-year averages 10-year averages	Education has no significant effect in most specifications. Adult males' years of secondary education have a positive and statistically significant impact on economic growth
29. Barro and Sala-i-Martin (2004)	1960-96	Primary, secondary and higher education gross enrolment rates in 1960	Bayesian averaging of OLS estimates		Primary enrolment in 1960 has significant and robust impact on subsequent growth rates
30. Hoover & Perez (2004)	107 countries 1960-89	Average years of primary and secondary schooling	OLS with white corrected standard errors	Cross-sectional data set	No robust or statistically significant impact of years of schooling on growth rate
31. Bloom *et al*. (2006)	1960-90	Change in years of schooling. Years of schooling, 1960	OLS/FE	10-year averages	Education variable has a significant and positive impact on growth rate
32. Gyimah-Bempong & Wilson (2004)	(1960-2000)	average numbers of years of higher, secondary, and primary education completed by the adult population (25 years or older)	Dynamic Panel Data estimator (Arellano and Bond, 1991)	5-year averages	Education-only human capital, including higher education, have positive and statistically significant effect
33. van der Berg (2007)					
34. Hanushek & Woessmann (2008)	1960-96	Years of schooling, 1960. Mean score, internationally significant if both entered comparable tests	OLS		Years of education is significant if entered alone; only test scores are significant if both entered
Public spending on education and growth					
35. Landau (1986)	65 low income countries 1960-80	Total investment in education	Pooled OLS	Lagged 3-year averages	The level of government educational spending is not correlated directly with growth or indirectly through generating actual education
36. Levine and Renelt (1992)	119 countries 1960-89				Government spending on education is not robustly correlated with growth rates
37. Easterly and Rebelo (1993)	100 countries 1970-88	Spending on education	OLS	Cross-section (averaged over 19 years)	Educational expenditure as a share of the economy is insignificant
38. Devarajan, Swaroop & Zou (1996)	43 low income countries 1970-90	Sectoral government expenditure, including educational spending	Pooled OLS, and an alternative OLS with fixed effects	Five-year forward moving average dependent variable vs annual observations for controls	Education expenditure is negatively associated with growth
39. Perotti (1996)	1970-88	Average share of government expenditure on education in GDP	OLS and 2SLS	Cross-section	
40. Miller & Russek (1997)	39 countries 1975-84	Total spending on education (% of GDP)	OLS, fixed and random effects	Annual data	Educational spending is negative for developing countries and positive for developed countries. It is negative for the whole sample

41. Kelly (1997)	73 countries 1970-89	Average ratio of education expenditure to GDP	OLS	Cross-section averaged over 1970-89	Educational spending fails to exhibit a significant relationship with growth
42. Kneller *et al*. (1999)	22 high-income countries 1970-95	Educational expenditure as part of productive public spending	OLS, fixed and random effects, instrumental variables	5-year averages of all variables	Productive expenditures have a significant positive coefficient
43. Zhang and Casagrande (1998)	69 countries 1970-85	Educational subsidies	OLs and 2SLS	Cross-section data averaged over 1970-85	Increasing education subsidies has a positive effect on growth
44. McMahon (1998, 2000)	East Asian countries	1965 primary, secondary and tertiary expenditures in GDP		5-year average of growth rates	Secondary and higher education spending show significantly favourable effects. Primary education expenditures are negatively related to growth rates
45. Haque (2004)	33 developing Countries 1980-97		OLS with error correction	5-year forward-moving averages of dependent variable	
46. Baldacci, Clements, Gupta & Cui (2004)	120 low income countries 1975-00	Education spending (% of GDP)	Fixed-effects (LSDV), FGLS, 2SLS, sys-GMM	5-year averages	An indirect positive and significant effects of educational spending on outcomes
47. Adam and Bevan (2005)	45 developing Countries 1970–99,	Level effects of public spending on education		5-year Averages	
48. Gupta *et al*. (2005)	39 developing Countries 1990-2000	Level effects of public spending on education		Annual observations for all variables	
49. Keller (2006)	40 Asian countries 1971-2000	Expenditures on education as a share of GDP	OLS with White's heteroscedasticity-consistent standard errors	10-year lagged averages	Primary education spending is significantly positive, while spending on secondary education is unfavourable among low-income countries and insignificantly negative globally
50. Bose, Haque & Osborn (2007)	30 low income countries 1970-90	Total spending on education	Seemingly unrelated regression	10-year averages	Government investment in education and total expenditure on education are significantly associated with growth
51. Blankenau, Simpson & Tomljanovich (2007)	23 developed countries 1960-00	Total public education spending	Pooled OLS with two-way fixed effects where appropriate	5-year average of the dependent and independent variables	Public expenditure on education negatively influences growth rates except when the impact of crowding effects is considered
52. Mo (2007)	1960-85	Share and growth of education expenditure in GDP	OLS with white-heteroscedasticity standard errors	5-year averages	Negative and significant? effect of educational expenditure on growth
53. van der Berg (2007)	South Africa 1999-2000				Despite massive shifts of fiscal resources to black schools, qualitative educational attainment differentials did not reduce
54. Ghosh & Gregoriou (2008)	15 developing Countries 1970-99	Education expenditure (% of total expenditure)	OLS	5-year forward-moving averages of LHS variable	Expenditure on education has a negative effect on long-run economic growth rate
55. Baldacci, Clements, Gupta and Cui (2008)\	118 developing countries 1971-2000	Education spending (% of GDP)	Fixed-effects (LSDV), FGLS, 2SLS, sys-GMM	Current and lagged 5-year averages for all variables to reduce measurement error	Education spending has an indirect impact on growth through its positive effect on education human capital
56. Miyakoshi et. al (2010)	Japanese prefectural governments 1981-2002	Share of education spending in total government expenditure	Fixed effects	Annual observations	Educational spending has negative effects on GDP growth
57. Alfonso & Jalles (2013)	155 countries 1970-2008 1960-2000		LSDV, IV-GLS, GMM	Non-overlapping 5-year averages	Positive and significant impact of educational spending on growth
58. Bojanic (2013)	Bolivia 1940-2010	Share of education spending in total expenditure	GMM	Annual observations for all variables	Positive but insignificant correlation between educational spending and growth.
59. Eggoh, Houeninvo & Sossou (2015)	49 African countries 1996-2010	Aggregate public spending on education as percentage of GDP	OLS corrected for heteroscedasticity and GMM	Cross-sectional and panel data analysis	Public expenditures on education has a negative impact on economic growth

Appendix 3.2: List of countries in our sample

1	Angola
2	Burundi
3	Benin
4	Burkina Faso
5	Botswana
6	Central African Republic
7	Cote d'Ivoire
8	Cameroon
9	Congo, Dem. Rep.
10	Congo, Rep.
11	Comoros
12	Cabo Verde
13	Ethiopia
14	Gabon
15	Ghana
16	Guinea
17	Gambia
18	Guinea-Bissau
19	Kenya
20	Lesotho
21	Madagascar
22	Mali
23	Mozambique
24	Mauritania
25	Mauritius
26	Malawi
27	Namibia
28	Niger
29	Nigeria
30	Rwanda
31	Sudan
32	Senegal
33	Sierra Leone
34	Eswatini
35	Seychelles
36	Chad
37	Togo
38	Tanzania
39	Uganda
40	South Africa
41	Zambia
42	Zimbabwe

Appendix 3.3: re-estimations of human capital and growth equations

Explanatory variables	**1**	**2**	**3**
Constant	-9.710***	-4.879***	-6.049***
	(4.650)	(2.860)	(2.270)
Physical investment (K)	0.028**	0.071***	0.055***
	(2.220)	(3.890)	(4.440)
Labour supply (L)	-0.201	-0.288**	0.027
	(0.960)	(2.390)	(0.250)
Primary enrolments	0.000		
	(0.020)		
Secondary enrolments	-0.012		
	(1.110)		
Tertiary enrolments	0.095***		
	(3.820)		
Primary expenditure		-0.083***	
		(3.360)	
Secondary expenditure		-0.043	
		(1.550)	
Tertiary expenditure		-0.042	
		(1.620)	
Repeaters			-0.079***
			(7.230)
Democratic accountability	0.018**	0.015***	0.016***
	(2.210)	(2.740)	(2.590)
Initial income level	-0.0002**	0.0002***	0.000
	(2.290)	(4.770)	(0.400)
Budget balance	0.033	0.024	0.033
	(1.010)	(1.130)	(1.530)
Year dummy	0.091***	0.074***	0.039**
	(4.680)	(2.930)	(2.320)
Observations	367	357	622
R-squared	0.2681	0.2931	0.2513
Prob > F	0.0000	0.0000	0.0000

Chapter 4

The political economy of fiscal deficits in developing countries

4.1 Introduction

In this last core Chapter of the thesis, we bring together the tax and expenditure dimensions of fiscal policy to consider why fiscal deficits[41] – the excess of public spending over revenue – have become common and getting out of control, especially in Africa. Chapter 2 is an analysis of the causes of low tax revenue performance and how effective systems of taxation and Chapter 3 explores how to make investment in human capital more effective, both of which matter for a country's fiscal balance. Fiscal discipline entails containing public spending within the bounds of domestic revenues (Collier, 1991) to promote macroeconomic stability, but often times expenditure outpaces revenues creating a negative fiscal imbalance – fiscal deficit. Policymakers and development agencies are profoundly concerned about large and persistent fiscal deficits because of their macroeconomic implications. A key link between fiscal deficits and the macroeconomy is how they are financed. It is recognised that "regardless of how they are financed", large and persistent fiscal deficits (and by implication, public debt) can have considerable macroeconomic implications (Beaugrand *et al*., 2002; p.7). There is growing consensus in development circles that large and persistent have wider implications: considerable macroeconomic instability (inflationary spirals which hit the poor the most), loss of control over the budget when public debt becomes unsustainable, undermine a country's ability to conduct prudent fiscal policy (ability to conduct effectively countercyclical fiscal policies), loss of investor confidence which negatively affects investment and the economy's competitiveness (Alesina and Drazen, 1991; Cukierman *et al.*, 1992; Neyapti, 2003). Easterly and Schmidt-Hebbel (1993: p.211) have observed that fiscal deficits which emerged in the 1970s and intensified during the 1980s were blamed for the "unsustainable public debt, weak government finances, high inflation rates

[41] Our measure of the fiscal deficit or balance is government revenues minus expenditure, and is considered a summary measure of the extent to which government is putting financial resources in the economy or utilising financial resources generated by the economy or from abroad.

and slow or the lack of economic development" in developing countries. Recently, the IMF, the leading agency on global fiscal matters, has advised that "fiscal discipline is essential for economic performance, macroeconomic stability and reducing fiscal vulnerabilities" (IMF, 2007: p.3).

Until the 1970s, fiscal deficits were a tolerable occurrence because they were only incurred in exceptional circumstances such as wars or recessions, and countries would run surpluses during booms or peace times to pay for previous deficits, and this helped to keep them in check. John Maynard Keynes formalised this argument in his "General Theory of Employment, Interest and Money" in which he argued that during recessions when income and employment fall, governments will run deficits or turn to borrowing to raise consumption (and boost aggregate demand) or provide unemployment reliefs, as a necessary. However, even Keynes acknowledged that deficits were only short-term policy instruments for stabilisation and would lead to chronic inflation if they prolonged. Thus, fiscal policy during this period, mainly promoted by Washington institutions in developing countries, was confined to short-term macroeconomic stabilisation and income distribution. However, analysts begun to reconsider these views as many countries entered a period of stagflation, large and persistent deficits which could no longer be explained by the Keynesian school of thought.

Data shows that low-income countries have on average run more frequent and larger fiscal deficits than high-income countries. In Africa some countries have experienced more frequent episodes of fiscal deficits over prolonged periods than others. Although global initiatives of the 1990s towards fiscal discipline and macroeconomic stability managed to bring down fiscal deficits until the 2000s (see Figure 4.1), but especially in Africa and the Middle East deficits have become increasingly common since the global economic crisis of 2008 and are getting out of control. An important issue for researchers and policymakers is to understand why fiscal deficits are frequent and what causes them to get out of control. For some while, analysts and international development agencies have sought to analyse and tackle this issue, and these efforts have culminated into making fiscal discipline a key element of the IMF and World Bank supported structural adjustment programmes in low-income countries.

The literature on the drivers of fiscal deficits, which mainly comprises cross-country regressions, has identified several factors. Some studies based on the '*tax smoothing*' hypothesis[42] argue that deficits are expected when there are temporary changes in government spending and economic activity to avoid the distortionary effects of tax increases (Barro, 1979: Lucas and Stokey, 1983). Other studies explore the impact of political attributes such as different types of political regimes – multiparty coalition, minority and short-lived governments. A popular belief among these studies is that economies governed by weak governments tend to be associated with larger deficits (Roubini and Sachs, 1989; Edin and Ohlsson, 1991). There are also studies considering if existence of an independent central bank can also be an important player for pushing for fiscal discipline due to the long-term connection between deficits and inflation, which central banks are more concerned about (Bodea, 2013: p.82). Fiscal deficits have also been associated with the myopic behaviour of governments because politicians when in office have strong incentives to optimise their behaviour within a short-term perspective by running large deficits in order to please the electorate and maximise their chances of being re-elected (Nordhaus, 1975; Rogoff, 1990; Alesina and Tabellini, 1987; Alesina and Perotti, 1995). A key finding within this *'political business cycle'* literature is that deficits are caused by re-election motivated political parties and leaders who manipulate fiscal and other policies to stay in power to advance their political and private objectives.

Our point of departure is that we go beyond just identifying the determinants of fiscal deficits as is common in previous studies, to explore factors which may contribute towards fiscal discipline and prevent deficits from getting out of control. This study attempts to break new ground in relation to previous work, by examining '*political business cycles'* and fiscal deficits in a comprehensive and systematic way: explore their incidence, the extent to which post-election cutbacks counterbalance pre-election boosts and also allow for country heterogeneity by considering whether their intensity depends on the relationship with aid donors as claimed by some studies and

[42] The '*tax smoothing'* theory of optimal fiscal policy is credited as the theoretical foundation of how to think about fiscal policies, including deficits. Tax smoothing literature makes a distinction between permanent and temporary changes in government spending and economic activity and asserts that governments should adjust tax rates only when there are permanent changes in government spending by spreading tax distortions over time, otherwise they should finance any temporary changes to government spending and economic activity by running deficits.

natural resource endowments. This approach gives us a complete and better characterisation of the relationship between '*political business cycles'* and fiscal deficits than previous studies.

The literature has also recognised that natural resource endowments can undermine fiscal discipline and lead to occasional catastrophic loss of fiscal control because fiscal policy in natural resource economies is directly linked to the use and management of resource revenues (Adam *et al.*,2003). Recent development literature has stressed that countries with large resource endowments face a complex range of fiscal management issues both on the revenue and expenditure sides of the fiscal balance: lower domestic tax effort from non-resource tax bases and which reduces the incentive for public scrutiny of government (Gupta, 2014); inability to effectively tax powerful mining and other natural resource companies which damages the perception of equitable treatment between taxpayers and therefore, tax capacity; inappropriate fiscal policies and weak absorptive and investment capacities lead to wasteful, unproductive or uneconomical projects with no bearing on economic diversification and growth; score very poorly in terms of linking short- to medium-term spending plans to clear long-run economic plans; and the weak ability to resist political demands for increased public spending during booms. Although clearly central to fiscal policy and development in Africa, the question of how natural resource endowments can damage fiscal discipline has been the subject of remarkably limited empirical work focussing on hydrocarbon exporters. Our study contributes to the literature by attempting to analyse the short- to medium-term effects of larger amounts of natural resource revenues on the fiscal balance, and to illustrate how poor management of natural resource revenues and their susceptibility to boom-bust cycles can contribute to the loss of fiscal control using a typical natural resource-intensive African country.

The third and final issue we consider is, what kind of policies and institutions can play a major role in preventing fiscal deficits from getting out of control in Africa? The literature has recognised that strong institutions can serve as powerful tools of restraint and deliver good fiscal performance (Collier, 1991). Both domestic and external institutions can help ensure government accountability and prevent the leakage of public; increase the efficiency of public spending (as we found in Chapter 3) and improve the prospects of achieving and maintaining fiscal sustainability (Dabla-Norris *et al*., 2010: p.3). During the past few decades, several developing countries have

made some steps towards institutional reforms which have essentially involved a shift towards improved institutions of governance (Morrissey and Stewart (eds), 1995). Most of the research on domestic institutions and fiscal policy has focussed on fiscal rules, central bank independence and the quality of budgetary institutions (IMF. 2012). Efforts to strengthen fiscal control and foster fiscal discipline have also featured quite prominently in donor technical assistance and IMF-supported structural adjustment programmes in the past decades. According to Easterly and Schmidt-Hebbel (1994), restoring fiscal discipline and reducing fiscal deficits has been central in most donor-supported reform programs adopted in many developing countries. Therefore, it is reasonable to expect that domestic institutions and the relationship between aid donors and recipient countries will be important determinants of the size of the fiscal deficit, and needs to be factored in any analysis of fiscal deficits in poor countries such as those in Africa. In this chapter, we focus on bureaucratic effectiveness and the capacity to control corruption as measures of domestic institutions, and the share of official development assistance as an indicator of the relationship between donors and recipient countries. Aid donors have for several decades financed a large part of development and recurrent expenditure of poor countries, and through aid allocation and conditionality attached to it, donors have had (or at least expected to have) influence on fiscal performance. However, a huge number of studies are sceptical about the link between aid and reforms in developing countries, but not much has been documented on why aid sometimes does not induce strong fiscal discipline in recipient countries.

As in the previous core chapters, the empirical approach is 'qual-quant'. Following existing literature, we begin by specifying a dynamic model representing the essence of the 'Nordhaus-type' opportunistic behaviour, but then include measures of the effects of natural resource endowments over the short- to medium-term and the impact of domestic and external institutions. Our estimating regression model is specified in a dynamic form to account for the strong inertia associated with fiscal variables. The baseline model is first estimated as a single equation using robust *OLS* and two-way *fixed effects* estimators with White standard errors which can address biases caused by autocorrelation and heteroscedasticity, whilst at the same time controlling for country-specific and time-specific unobserved heterogeneity to minimise any effects that may arise from omitted variable bias. We then estimate a system of equations by the instrumental variable estimator *three-stage least squares* (*3SLS)* to try and address any simultaneities and reverse

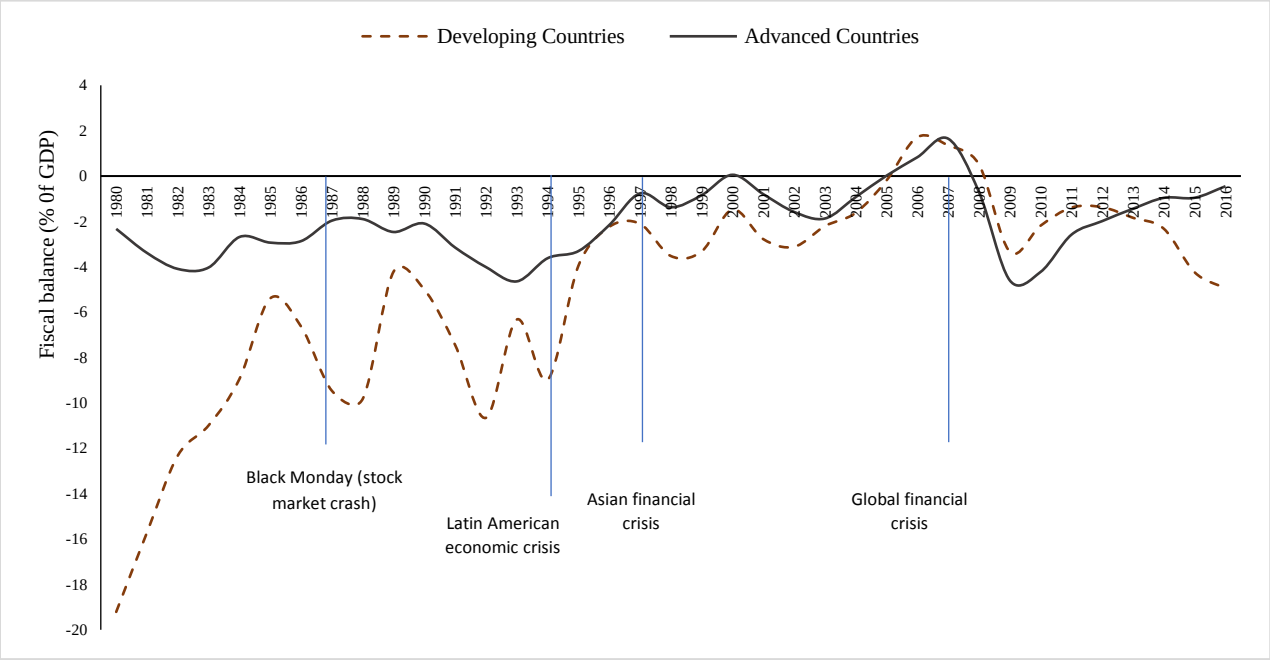
causality in the model. In the final section, we employ a qualitative approach mainly using scatterplots for case study of Zambia to highlight particularities of causation which do not emerge properly from the regressions. The data is primarily from the World Bank's *World Development Indicators* and the IMF's *World Economic Outlook* databases. The statistical package used in our estimations is Stata/IC 14.2.

4.2 Variations in fiscal performance

The latest data from the International Monetary Fund's *World Economic Outlook*, shows that there are variations in fiscal deficits across income groups, geographical regions and within income and regional groups. As can be noted from Figure 4.1, which shows fiscal balances as a share of GDP, on average fiscal deficits[43] have been larger and more frequent in developing than in developed countries over the past few decades (1980s-2015). In other words, during the period between 1980 and 2005, on average governments in developing countries ran more expansionary fiscal policies than developed countries. Other notable trends from these groups of countries are that fiscal deficits have fluctuated more widely in developing than developed countries and that there were marked improvements from the mid-1990s until the global financial crisis of 2007/8. As can be observed from Figure 4.1, except for the 2007/8 global financial crisis, several other important global economic phenomena – *black Monday, Latin American currency crisis and Asian financial crisis* – do not appear to have had any significant effect on fiscal deficits in both advanced and developing countries.

[43] The fiscal deficit is estimated as government expenditure (net of aid flows) less government tax and nontax revenue as a share of GNP, as published by the IMF's *World Economic Outlook* database.

Figure 4.1: Fiscal balances in developing and advanced countries (1980-2016)

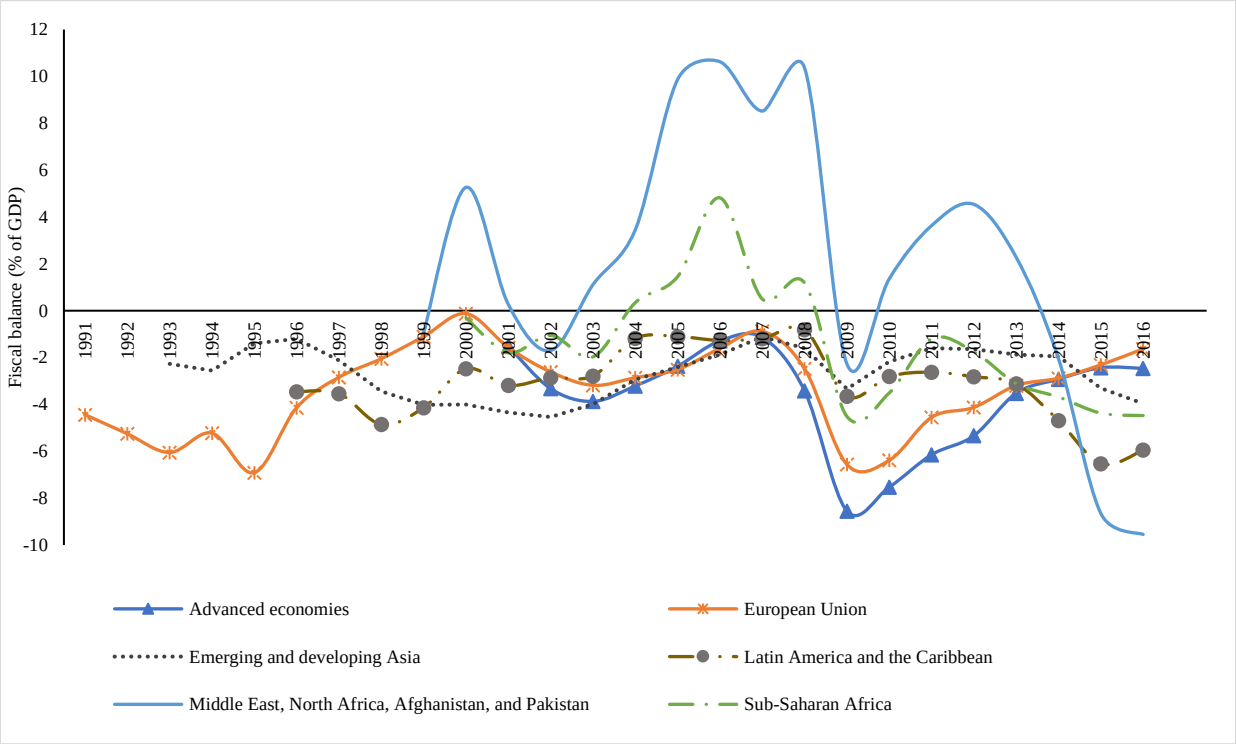


Source: *World Economic Outlook* database (IMF, 2017)

Note: The classification of countries into developing and advanced is based on the IMF classification by the level of development. The graphs reflect averages for selected countries for which data was available and do include all eligible countries in each category. Major economic crises represent episodes which simultaneously affected a large number of countries.

Figure 4.2 shows fiscal trends according to geographical regions since the early 1990s. Again, even here there are noticeable variations across regions. Although most countries were negatively impacted by the global financial crisis, the biggest deterioration in deficits over the past decade has been observed in the Middle East from a surplus of 10.6 percent of GDP in 2006 to a large deficit of almost 10 percent in 2016 and Africa from a surplus of 4.8 percent to a deficit of 4.5 percent of the same period.

Figure 4.2: Fiscal balances by geographical regions (1991-2016)



*Source: *World Economic Outlook* (IMF, 2018). The annual rate of change has been calculated by the author using IMF data.

Notes: Fiscal performance figures reported in here represent decade long averages between 1991 and 2016. Note: The classification of countries by geographical region is based on the IMF classification. The graphs are based on annual data as published by the IMF.

An examination of data from the IMF's *World Economic Outlook* for selected sub-Saharan African countries in our sample, which are reported in Table 4.1, also reveals that there are cross-country variations even within this group. Firstly, few countries in the sample reported here entered the 1980s with strong fiscal positions (surpluses or low fiscal deficits). Secondly, eleven out of thirty-three African countries were able to reduce their fiscal deficits over the decades 1990/99 to 2010/17, achieving significantly low end-period deficits or even recording surpluses, yet twice as many experienced a deterioration in fiscal balances over the same period. As reported in Figure 4.2, deficits in the Africa region are among the fastest growing globally since 2006. Finally, it is quite striking that fiscal deficits have protracted for decades in nineteen out of thirty-one countries in Africa, suggesting that lack of fiscal discipline may be a serious problem in certain countries.

Table 4.1: Fiscal balances in selected African countries (decade averages) 1980-2017

Country	1980s	1990s	2000s	2010s[a]	Annual rate of change, 2008-2017[b]
Angola		-2.9	0.8	-0.5	-0.2
Benin	0.9	-0.9	-2.2	-3.2	-0.6
Botswana			1.1	-0.3	0.6
Burkina Faso	-0.6	-2.4	-2.3	-3.7	-0.4
Burundi		-2.5	-8.2	-4.5	-0.5
Cabo Verde		-10.6	-6.0	-7.0	-0.2
Cameroon			4.4	-3.5	-0.7
Cent. Afr. Rep.	-3.5	-4.3	-0.5	-1.9	0.0
Chad		-3.7	-2.5	-1.7	-0.4
Comoros	-6.1	-3.2	-2.1	3.3	0.3
Congo, DR		-1.1	-0.5	-0.1	-0.1
Côte d'Ivoire		-1.3	-0.9	-3.1	-0.4
Eswatini	1.0	0.1	-0.5	-4.2	-0.8
Ethiopia	-4.0	-4.8	-4.2	-2.0	0.0
Gabon		-2.3	7.6	0.8	-1.3
Gambia			-1.4	-4.4	-0.5
Ghana	-1.8	-4.9	-3.7	-6.7	0.2
Guinea		-2.4	-2.4	-3.7	-0.2
Guinea-Bissau		-1.9	-4.0	-2.4	-0.1
Kenya	-3.4	-4.3	-1.9	-6.4	-0.4
Lesotho	0.9	1.7	3.0	-2.1	-1.1
Madagascar	-6.7	-5.1	-3.1	-2.4	0.0
Malawi			-3.0	-4.5	-0.4
Mali			0.4	-2.6	-0.1
Mauritius			-4.1	-3.0	0.0
Mozambique	-7.0	-2.6	-3.3	-5.4	-0.1
Namibia		-2.0	0.1	-5.8	-0.8
Niger		-3.5	1.7	-4.5	-0.7
Nigeria		-1.1	1.8	-2.6	-1.1
Rwanda		-5.9	-0.3	-2.1	-0.3
Senegal		1.7	-1.5	-3.9	0.1
Seychelles	-0.2	-3.4	-3.5	1.7	-0.8
Sierra Leone			-0.9	-5.3	-0.5
South Africa			-1.0	-4.4	-0.4
Tanzania		-1.9	-2.1	-3.2	0.1
Togo	-2.9	-4.5	-1.5	-5.7	0.1
Uganda		-1.2	-1.2	-4.2	-0.1
Zambia	-3.8	-4.8	-4.6	-7.2	-0.7
Average (for above countries)			**-1.1**	**-3.2**	**-0.4**

*Source: IMF World Economic Outlook (2018). The annual rate of change has been calculated by the authors using IMF data.

Notes: Fiscal performance figures reported in the first three columns represent decade averages between 1980 and 2017. Where there are data limitations, the decade averages have been calculated based on the data available in that decade. [a] Data in column 2010/17 is averaged over eight years. [b] The annual rate of change represents the annual percentage increase (or decrease) in the fiscal deficit during the period 2008-2017.

In summary, these data show that on average fiscal deficits are more prevalent in developing countries than developed countries; there are variations even across geographical regions with sub-Saharan Africa, the content with the largest concentration of natural resource dependent countries,

emerging with one of the worst deterioration trends in deficits since over the past decade. These developments are against the backdrop of Africa having experienced some of the most significant political developments over the last three decades, with many countries having transformed their governance structures to more democratic and competitive systems. Africa has also undergone a long process of economic reform, focusing on macroeconomic stabilisation and restoring fiscal discipline as a major component of this reform. The stylised statistics clearly demonstrate that despite the substantial progress made in economic and political reforms since the mid-1980s, many developing countries are now suffering from chronically recurrent large deficits. Although global and national efforts of the 1990s and 2000s helped to improve fiscal balances and led to significant progress towards macroeconomic stability and stronger economic growth, recent developments have revived interest in fiscal deficits. The re-emergence, and apparently widening fiscal deficits and the corresponding rise in public debt in many developing countries, warrants an investigation into the causes of such trends.

4.3 Previous studies – A survey of the literature

A deficit in a country's budget reflects the fact that public spending has exceeded revenues. As mentioned earlier there is a huge literature on various causes of fiscal deficits, but because this chapter is about the political economy of deficits, we focus on the literature which points to features of politics that affect incentives to overspend. A growing political economy literature has developed theories to explain how political factors determine fiscal outcomes and has provided supporting empirical evidence; see, for example, Table 4.2. Alesina and Perotti (1995) and Persson and Tabellini (1997) also provide an excellent survey of this literature. These studies have identified channels such as political instability, government fragmentation, centralisation of authority in budgetary decisions and socio-political polarisation as drivers of deficits (Roubini, 1991; Edin and Ohlsson, 1991; Blais *et al*., 1993; Woo, 2003). Other political economy studies aim to assess the conduct of fiscal policy around election time. In particular, the literature known as *'political budget cycle'* models predicts that incumbent political leaders and parties tend to have strong incentives to choose or manipulate policy instruments so as to maximise their chances of re-election. This literature has evolved overtime mainly distinguishing between opportunistic models (Nordhaus, 1975) and partisan models (Hibbs, 1977). The opportunistic models assert that,

because politicians are in control of fiscal policy instruments which can affect economic performance, and because voters are myopic, they have strong incentives to manipulate such instruments in their favour around election time. The rationale behind these models is that chances of re-election strongly depend on the "existence of good macroeconomic conditions" (Schultz, 1995: p.79). The partisan-type models of '*political business cycles*' emphasise ideological orientation. These models claim that left-wing governments are inclined towards more income-redistribution and expansionary policies than right-wing governments. The implication of '*political business cycle'* theories is that politicians will engage in expansionary economic policies and create cycles in fiscal and other macroeconomic variables during elections. However, because of the long-term cost implications of expansionary fiscal policies, it is expected that governments will counterbalance pre-election boosts with post-election cutbacks to bring down the deficits.

Because of the detrimental effects that such policy manipulation and reversals might have on a country's future economic prospects, there has been significant interest in this area since the 1970s. Early studies prior to the 1990s focus on developed countries and largely reports very limited and weak evidence. A comprehensive review of these early studies is found in Alesina *et al*. (1997) and Drazen (2001). Our focus here is on recent studies, which have analysed this phenomenon in developed and developing countries from the 1990s mainly because this period covers important political developments in Africa – democratisation of the continent which has brought about more frequent and fairer elections. As can be observed from Table 4.2, studies show strong evidence of the existence of election-linked cycles in fiscal deficits in developing countries and 'new democracies'[44]. One of the first studies focussing on fiscal policy instruments, Schuknecht (1996), shows evidence of expansionary fiscal policies during elections, with public expenditure being the more preferred policy than tax policy. The two studies which have systematically analysed African data are from the 1980s (Schuknecht, 1996) and 1990s (Block, 2002) mostly covering periods when most of these countries were non-democratic and elections were not competitive, thus brining into question whether there was 'real' fiscal manipulation as it is now recognised in the literature that political business cycles are not encountered in political

[44] Other studies also focus on the manipulation of the composition of government spending which does not necessary affect the level (Rogoff, 1990; Bove, Efthyvoulou and Navas, 2016) and categories of tax instruments (Ehrhart, 2012; Ebeke and Ölçer, 2013). However, our focus is on the manipulation of the fiscal deficits.

systems where the incumbent is a ‘dominant party’ (Mosley and Chiripanhura, 2012: p.3) or is the only party as was the case in most African political systems prior to the 1990s.

Table 4.2: Selected studies on the determinants of fiscal deficits

Author(s)	Sample	Focus of study	Political factor proxied by	Estimation method	Main finding(s)
Schuknecht (1996)	35 developing countries 1970-1992	PBCs and economic policies	Election year dummy variable	Fixed effects specification	First paper to show that governments in developing countries engage in expansionary fiscal policies around elections, but such cycles are less significant in more trade-oriented countries. they also show that certain types of IMF-supported programme help to counteract fiscal
De Haan and Sturm (1997)	21 OECD countries 1982-1992	State weakness and fiscal outcomes	Index of political cohesion, represented by the number of political parties in government	Weighted least squares	In contrast to the findings of Roubini and Sachs (1989a), de Haan and Sturm do not find a statistically significant relationship between the power dispersion index and fiscal outcomes.
De Haan, Sturm and Beekhuis (1999)	21 OECD countries 1979-1995	State weakness and fiscal outcomes	Index of political cohesion, represented by the number of political parties in government	Weighted Least Squares regressions	No evidence that the number of political parties in coalition government is not correlated with fiscal outcomes, in contrast with previous findings of Roubini and Sachs (1989) and Edin and Ohlsson (1990).
Schuknecht (2000)	24 developing countries 1973-1992	Political business cycles in budget deficits	Election year dummy variable	Fixed effects estimator	The main vehicle for expansionary fiscal policies around elections public expenditure rather than lowering taxes, and public investment cycles
Sakamoto (2001)	18 OECD countries 1961-1994	State weakness	Minority governments, coalition governments, short tenure governments	OLS with panel-corrected standard errors	The evidence shows that budget deficits are lower under weak governments (minority, coalition or less durable governments).
Block (2002)	44 Sub-Saharan African countries 1980-1995	Political business cycles	Election and post-election year dummy variables	OLS, Fixed Effects and GMM	There is evidence of systematic electorally linked manipulation of fiscal and monetary policies in new democracies in Africa, and that the cycle is completed during the year after elections when deficits are smaller than normal.
Block *et al*. (2003)	44 sub-Saharan African countries 1980-1999	PBC-type policy manipulation	Election year dummy variable, competitive elections and founding elections	OLS, Fixed Effects and GMM	PBC-type policy manipulations are smaller or non-existent in countries where elections are not competitive but are larger in countries with 'founding elections'.
Persson and Teballini (2003)	60 countries 1960-1998		Constitutional rules leading to different election systems and forms of government		The election cycle is significantly affected by the various constitutional rules
Neto and Borsani (2004)	10 Latin American countries 1980-1998	Political factors, institutions and fiscal policies	Size of president's party Ministerial stability Ideology of cabinet Electoral cycle	GSL with standard errors corrected for panel data	Evidence that elections cause deterioration in fiscal performance in Latin America. All the political variables were statistically significant
Brender and Drazen (2005)	68 DC and LDC countries; 1960–2001	PBCs in new and old democracies	Election year dummy variable, democracy from Polity IV	Fixed Effects on full sample and GMM on	Evidence of a highly significant PBC in fiscal deficits in new but not in established democracies.

				sub-samples of new and old democracies	
Shi and Svensson (2006)	85 countries; 1975–1995	Causes of differences in size of PBCs	Corruption, ICRG institutional quality index, and access to free media	Fixed Effects and GMM	PBCs in budget deficits are larger in developing countries but small or non-existent in developed countries. There is also evidence that PBCs are smaller in countries with strong institutional constraints on politicians and a large share of informed voters.
Alt and Lassen (2006a, 2006b)	19 OECD countries, 1989–1998	Institutional transparency, political polarisation and PBCs	Index of transparency of fiscal policy in Alt and Lassen (2006b) and measure of party polarization in Laver and Hunt(1992)	GMM	PBCs are larger in countries with low fiscal policy transparency and in more polarized developed countries.
Brender and Drazen (2007)	68 countries; 1960–2001	New and established democracies and PBCs	Democracy variable from Polity IV	Fixed effects	PBC effect in total sample is caused by the elections in new democracies
Barberia and Avelino (2011)	18 Latin American countries 1973-2008	Democratic regimes	Democracy variable from Polity IV and Cheibub *et al*. (2010)	Pooled OLS and GMM	There is evidence of PBCs in Latin American democracies, but the study does not find a robust result, like Brender and Drazen, who argue that nascent democracies are more prone to PBCs. They also find evidence that PBCs are mainly present in tax revenues and not in deficits or expenditure.
Klomp and de Haan (2013b)	70 democracies 1975–2005		Majoritarian system Parliamentary System Minority Governments Number of coalition parties	GMM	In industrial countries, the election effect is strongest under majoritarian electoral systems. In developing countries, the election effect is strongest under proportional electoral systems
Ebeke and Ölçer (2013)	68 low income countries 1990-2010	Fiscal rules and IMF sponsored programme	Dummy variable if fiscal rules are adopted Dummy variable if IMF programme in place	System-GMM	In an election year government consumption expenditure increases leading to larger budget deficits. Post-election fiscal adjustment takes the form of higher tax effort and cuts to government investments. PBCs are lower where there are fiscal rules or participating in IMF programmes.
Veiga, Veiga and Morozumi (2017)	70 developed and developing countries 1975-2010	Election dummy for the year of election Democracies, excluding non-democracies	Media freedom (low, medium and high)	Fixed effects and System GMM	Budget deficits increase in elections years and this is driven by an increase in the recurrent component of government expenditure and not capital expenditure

Although the '*political business cycle*' literature has improved our understanding of how political factors can affect government fiscal policy choices and outcomes, and how this can potentially exacerbate the risks of significant macroeconomic instability and fiscal unsustainability, important issues with possible policy implications still remain. One such significant issue is that it is typically assumed that politicians effectively implement the deflationary part of the '*political business cycle'* to bring the deficits down and prevent them from prolonging. We, however, have very limited evidence on how symmetrical the reflationary and deflationary phases of the '*political business cycles'* are and how long election-linked fiscal deficits take to come down. While re-election motivated incumbent political parties and leaders may have very strong incentives to engage in fiscal manipulation, it is reasonable to expect that the incentives they face when implementing the deflationary phase of the cycle may be different or even stronger. It is recognised that in fragile political environments, although it is easier to implement a pre-election boost to win the support of powerful constituencies, it is much more politically difficult to counterbalance such with drastic cutbacks or higher tax revenues (as we discovered in Chapter 2) because of the political weakness of governments and excessive politicisation of fiscal policies in developing countries (Snider, 1990: p.1263). Governments in politically fragile environments, face strong constraints in implementing austerity measures for fear of alienating the base and the potential political reprisals from voters and powerful interest groups on whom their stay in power or political stability depends. Huebscher *et al.* (2018) find evidence that the popularity of incumbent governments decreases when they "propose austerity", especially spending cuts and can contribute to political instability. The existence of such political constraints can make it difficult to implement austerity measures which reduce the welfare of these groups, thus presenting African governments with an unpleasant choice of surrendering to the cycle and thus causing a temporary deficit to persist. However, for now this is just a proposition as we have very limited evidence concerning whether politicians are able to implement symmetrical deflationary measures or how long the deflationary phase take and what impact this has had on the ability to prevent temporary deficits from persisting. Our aim here is to try and contribute to this debate. We seek to explore the incidence of 'political business cycles', the extent to which post-election cutbacks counterbalance pre-election boosts and also allow for country heterogeneity since it has been recognised that '*political business cycles'* are neither universal nor homogenous (Mosley and Chiripanhura, 2012) by considering whether the ability to finance a pre-

election boost depends on the relationship between recipient countries and aid donors who finance a large part (more than 35 percent in some countries) of public expenditure as claimed by some studies or natural resource endowments. This approach gives us a complete and better characterisation of the relationship between '*political business cycles'* and fiscal deficits than previous studies.

The second issue we wish to explore is the relationship between natural resource endowments and fiscal deficits. It has been recognised in the literature that natural resource endowments can undermine fiscal discipline and lead to occasional catastrophic loss of fiscal control because fiscal policy in natural resource-intensive economies is directly linked to the use and management of resource revenues (Adam *et al.,*2003). Recent development literature has stressed that countries with large resource endowments face a complex range of fiscal management issues both on the revenue and expenditure sides of the fiscal balance (Crivelli and Gupta, 2014; IMF, 2013). Although resource endowments represent an opportunity for the government to increase tax revenues studies show that in practice a large share of resource revenue flows actually lowers the performance of non-resource tax revenues and this reduces the incentive for public scrutiny of government (Moore, 1998; Gupta, 2007; Bornhorst *et al.,* 2008). Also, many governments of resource-intensive economies are unable to collect the taxes that natural resource companies owe for a number of reasons, *inter alia*, sub-optimal fiscal regimes and inability to resist threats from powerful mining and other natural resource companies not to be subjected to higher taxation (or else they threaten to leave), which damages the perception of equitable treatment between taxpayers and therefore, tax capacity (Crivelli and Gupta, 2014; IMF, 2013). It is also documented in the literature, and from our own experience working in the Ministry of Finance in Zambia, that although additional resource revenues represent an opportunity for government to finance higher current spending. Cuddington (1998), Lane and Tornell (1999), Alesina *et al*. (2008) and Sinnott (2009) show evidence that current tax revenues and royalties from natural resources and public expenditure increase during resource booms in developing countries. However, inappropriate fiscal policies and limited absorption and investment capacities often lead to wasteful spending typically on consumption, unproductive and uneconomical projects with no bearing on economic diversification and growth. This is well illustrated by the case of Chad, where 70 percent of the fiscal resources come from oil, but rather than translating into better

economic and human development, much of the revenues generated in the past decade (18 percent of the budget) have instead been spent on security services with the result of a growing debt stock and one of the lowest rankings on the human development index (184th). Gelb (1986) and Medas and Zakharova (2009) also show that additional resource revenues are typically spent on investments projects with a medium- to long-term completion period, higher wages for government workers and increased number of public sector workers. Management of resource revenues is further compromised by the fact that inflows are very unpredictable and volatile, and often create 'boom-bust' cycles with significant implications for budgetary planning and debt management (Ploeg and Poelhekke, 2009). A key issue for fiscal management is that during 'booms', public spending rises to match current revenues but during 'busts', spending tends to remain elevated, thereby creating large deficits which may prolong for some time. These fiscal risks are exacerbated by the short-term nature of budget cycles. Although clearly central to fiscal policy and development in Africa, the question of how natural resource endowments can cause occasional loss of fiscal control has been the subject of remarkably limited empirical work and mainly focuses on oil exporters. Our study attempts to contribute to the literature by analysing the short- and medium-term effects of larger amounts of natural resource revenues on the fiscal balance. We also attempt to illustrate how natural resource endowments and their susceptibility to boom-bust cycles can contribute to the loss of fiscal control using a typical example of a natural resource-intensive African country. Our analysis focuses on the impact of the 'boom-bust' cycles created by natural resource endowments by exploring whether additional resource revenues that accrue to the government during booms help to cushion current fiscal deficits, but because of poor fiscal policies and weak management of these additional revenues, coupled with weak absorption and investment capacities, these additional resources are wasted on consumption and unproductive projects, and therefore over the medium term (2-3 years) revenues fall (as the boom disappears) and create fiscal deficits.

The political economy literature has also shown that natural resource endowments tend to weaken or retard institutional development through various mechanisms (Ross, 1999: p.308; Collier and Hoeffler, 2005). The theoretical literature shows that in a grabber-friendly environment, a greater amount of natural resource increases the number of entrepreneurs engaged in rent-seeking rather than productive activities, because natural resources "produce rents" (Collier

and Venables, 2010: p.1). Isham *et al*. (2005) argues that access to natural resources by the elite often suppresses voice and accountability, because governments that generate most of their revenues from natural resources are not constrained by the need to negotiate for domestic taxes. The literature has also singled out corruption as one of the most significant mechanisms through which natural resources can damage institutions (Bannon and Collier (eds), 2003). Because natural resource abundance diminishes the quality of institutions, weakens systems of checks and balances, limits the development of more democratic systems of governance and produces less accountable leaders and citizens (Ross, 2001), it is reasonable to expect *a priori* that they are likely to be negatively correlated with fiscal discipline and therefore, fiscal deficits. This has become one of areas of focus of international debate and therefore an important issue in this study.

Finally, undeniably, the study of fiscal deficits cannot be complete without considering the major role played by domestic and external institutions in preventing fiscal deficits from getting out of control in Africa. Collier (1991: p.339) argues that these institutions can "protect public assets from depletion, prevent corruption, protect socially productive groups from exploitation and enforce contracts". He further argues that at macroeconomic level domestic and external institutions play a major role in restraining public expenditure from outpacing revenues and deliver good fiscal performance. Until recently, standard macroeconomic theory had taken it for granted that governments had enough capacity to design and implement policies, yet several studies highlight the negative consequences of weak and poorly functioning domestic institutions on Africa's underdevelopment (Sachs and Warner, 1997; Easterly and Levine, 1997; World Bank, 1989; 2003). These issues have featured quite prominently in the development discourse (World Bank, 2003; Alence, 2004: p.164). On the domestic front, the political economy literature documents channels through which incentives to overspend, induced by factors such as the common pool resource problem and the political nature of fiscal policy as discussed above, can be mitigated. Institutional arrangements such as an independent central bank are examples of such institutions because of the preference for fiscal conservatism and discipline (due to the long run connection between deficits and inflation) (Cukierman *et al.*, 1992; Sturm, 1992; Sikken and de Haan, 1998; Bodea, 2013). Independent central banks can contribute to fiscal discipline through, *inter alia,* interest rate hikes and the refusal to lend to government. Most of the research on domestic institutions and fiscal policy has focussed on the role of fiscal rules, central bank

independence and the quality of budgetary institutions (IMF. 2012). Other domestic institutional arrangements which have also been credited in the theoretical literature for promoting fiscal rectitude are those that contribute towards government accountability and transparency, prevent leakage of public resources, increase the efficiency of public spending (as we found in Chapter 3) and improve the prospects of achieving and maintaining fiscal sustainability (Collier, 1991; Dabla-Norris *et al*., 2010: p.3). These institutional mechanisms promote transparent and enforceable accountability systems making it politically costly for the incumbent to engage in opportunistic use of fiscal policy, while allow such institutions to act unconstrained on their aversion of fiscal deficits (Bodea, 2013). Much of the empirical literature on the link between domestic institutions and fiscal policies has focussed on the revenue side. For example, Gupta and others (2007) find that the weak ability to control corruption undermines tax effort. Besley and Persson (2010) and Knack (2008) show that in natural resource-dependent economies, natural resource rents create disincentives to invest in effective systems of taxation. Besley and Persson (2014) report that developing countries tax so little because corrupt systems of government face resistance to increasing taxes. More recently, Baum *et al*. (2017) find evidence that corruption undermines tax capacity due to its adverse impact on tax compliance. We have also already encountered in Chapter 2 that weaknesses in bureaucratic institutions of government enable the copper companies, gold mines and other resource industries to escape payment of tax, hold the country to ransom and in innumerable ways create or push up significant budgetary gaps. Few studies that focus on public expenditure show that where domestic institutions are weak or poorly functioning, there is inefficient allocation of public spending (as we also encountered in Chapter 3), governments especially in resource-intensive countries deliberately underinvest in human capital accumulation, which has implications on growth, and spend more on corrupt and unproductive capital projects because of the 'rents' they generate in form of bribes and kickbacks. During the past few decades, several developing countries have made some steps towards institutional reforms which have essentially involved a shift towards improved domestic institutions of governance (Morrissey and Stewart (eds), 1995; World Bank, 2003). Based on its predicted positive contribution towards fiscal discipline, it is reasonable therefore to expect that the quality of domestic institutions will be an important determinant of the size of the fiscal deficit, and needs to be factored in any analysis of fiscal deficits in poor countries such as those in Africa. We focus on bureaucratic effectiveness, which encompasses the ability to design and implement sound and prudent fiscal policy, and the

ability to control corruption, a key factor affecting revenue mobilisation efforts and the quality of public spending, as measures of domestic institutions. The aim here is to update the literature using a more recent dataset than previous studies and focus on Africa so as to expand the evidence base on the connection between fiscal deficits and domestic institutions.

External actors like the international financial institutions and bilateral aid donors have also played an influential role. For some time, developing countries that have experienced macroeconomic crises, and significant fiscal imbalances, have sought the assistance of external actors like the IMF, World Bank and other bilateral aid donors. Analysts have attributed the cause of much of the economic crises of the 1970s through the 1990s, to inappropriate domestic policies. For example, Easterly and Schmidt-Hebbel (1993) report that the debt crisis and the crippling stagflation experienced during the 1970s were mainly blamed on poor fiscal policies. The international development community had sought to tackle this problem by promoting policy and institutional reforms in exchange for financial aid, and until recently, the disbursement of much of this aid to developing countries was largely tied to policy reforms laid out in a series of structural adjustment loans (World Bank, 2000; Mosley *et al*. 2004). An aid package typically agreed with the IMF and World Bank, would comprise an element for the restoration or maintenance of fiscal discipline, with strong emphasis on the reduction of the fiscal deficit as a panacea for overcoming macroeconomic instability in poor countries. These aid packages were expected to have the effect of bringing public expenditure closer to revenues and help to maintain public debt with moderate bounds. The practice of tying aid to domestic policy reforms in developing countries, which has been perceived to be an important instrument for correcting domestic policy failures, was initially exclusive to IMF and the World Bank financing arrangement, but increasingly adopted by some bilateral aid donors in more recent times. Since the 2000s, aid donors have realised that the problem of Africa's underdevelopment is not necessarily poor domestic policies alone, but also weak capacity to design and effectively implement policies. There has now been a huge shift from policy-based lending towards the increased role of governance (or attempts at it) in budgetary processes and practice of aid agencies. Aid donors have intervened in influential ministries like finance, as they are more enthusiastic about improving democracy, decentralisation, civil service reforms and also about promoting institutional reforms like establishment of effective anti-corruption agencies, autonomous revenue authorities and public financial management systems.

Since the early 1980s, virtually every African country has received large amounts of aid aimed at stimulating policy reform. While there is broad consensus on the major role that external actors play, using foreign aid in stimulating policy and institutional reform the evidence has varied enormously including on its impact fiscal deficits.

Most cross-country empirical studies of aid have identified its effectiveness on domestic revenue mobilisation effort as the main mechanism through which it influences fiscal discipline. The role of foreign aid in stimulating policy and institutional reforms and what impact this has had on fiscal deficits in Africa has received little attention. Studies, however, have shown that foreign aid leads to a reduction in government effort (substitution effect) to collect domestic tax revenues. Bräutigam and Knack (2004), Moss *et al.* (2008) and Benedek and others (2013) report that aid is negatively correlated with tax collection. However, other studies report a positive impact (Clist and Morrissey, 2011; Carter, 2013; Clist, 2014). Ouattara (2006) finds an insignificant correlation. Further, our analysis in Chapter 2 of this thesis shows that foreign aid has not helped developing countries improve their capacities to generate tax revenues from domestic sources. In a recent IMF Working Paper, Combes *et al*. (2016) show that large aid inflows weaken tax capacity. On balance most of this literature implies that an increase in foreign aid can compromise fiscal discipline and lead to lower tax revenues thereby creating budgetary gaps. From this evidence, the potential indirect contribution of foreign aid towards fiscal discipline through fiscal, budgetary and public financial management reforms as discussed above has rarely been captured in quantitative analyses. It is therefore, unclear what the overall impact of the two effects – the positive impact of reforms (through both spending and/or tax reforms) and the negative effects of aid on tax effort – have been on fiscal deficits. In this chapter, we abstract from assessing the effect of aid on the revenue or expenditure only to consider the combined effect on overall fiscal balance, an area which has surprisingly attracted sparse empirical attention. Using the fiscal deficit rather than restricting the analysis of the impact of aid donors on fiscal discipline to either revenues or expenditure has the advantage of capturing the combined effect. We refrain from an *a priori* prediction of the direction of the effect and allow the data to show us as it depends on the direction and magnitude of the individual effects. We also wish to identify some of the causal factors that may underlie the lack of effectiveness of foreign aid in promoting fiscal reforms and discipline in Africa especially in the recent past, based on a country case study.

4.4 Empirical approach

The ideas from the previous section which we wish to test empirically in this section are: the extent to which pre-election fiscal boosts are counterbalanced by post-election cutbacks to try and bring fiscal deficits down to avoid temporary fiscal deficits from getting out of control in Africa; how natural resource endowments can compromise fiscal discipline over the medium- to long-term effects, focussing on government weak ability to effectively tax and manage resource revenues, the damage that natural resources inflict on institutions of governance and the consequences of the 'boom-bust' cycles which complicate budgetary planning and debt management; and the role of domestic and external institutions in promoting fiscal discipline, and causal factors that may underlie their lack of impact. Apart from specifying a model that captures this story and enables us to empirically test these relationships, we also describe the data and its sources, and the estimation techniques used in this chapter. Finally, the quantitative findings and policy implications are reported and discussed in the last part of this section.

Our starting point is to specify a Nordhaus-type opportunistic model, which will enable us to assess the existence of election-linked fiscal policy manipulation by the incumbent. This is captured by the inclusion of a dummy variable for each year a national election occurred. To address any potential problem caused by endogenously timed elections, we only consider national or parliamentary elections which are pre-determined according to national laws and excluded those which are called (by-elections). To capture the impact of post-election fiscal policy, in particular, whether the deflationary phase of the '*political business cycle'* is implemented to bring election-linked fiscal deficits down, we include two post-election variables: one for immediate year and the other in the second year after the election. these election variables enable us to assess fiscal behaviour during and after elections. According to the Nordhaus-type '*political business cycle'* theory the election year dummy variable is expected to be negative while the post-election dummies are expected to emerge with a statistically significant positive coefficient.

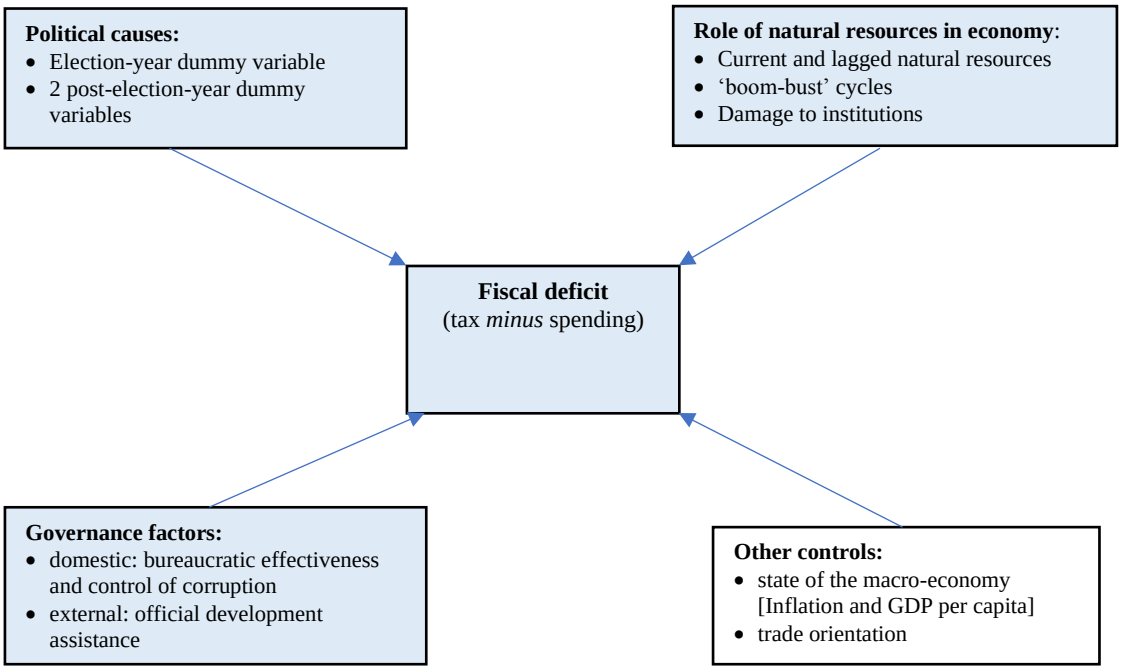
We then proceed to consider whether natural resource endowment has a negative medium-term impact as discussed earlier and through its negative impact on institutions. Following standard literature, this is captured by including both the current and lagged values of

the measure of natural resources. The lagged natural resource variable is assumed in our view to capture the impact of previous years' resource booms or windfalls on the current fiscal deficit, and based on our predictions from the previous section, its coefficient is expected to be negative. Finally, to capture the effectiveness institutions in promoting fiscal discipline we incorporate bureaucratic effectiveness and ability to control corruption as indicators of domestic institutions, and the share of official development aid to represent the influence of aid donors.

However, to convert our basic story at the core of this study into a formulation which will give us a better picture on the determination of fiscal deficits, we need to bring into the picture as controls, those structural influences which have long been recognised to potentially have a bearing on deficits. Although studies in this area control for several variables, we focus on those which are common across most studies such as: those which relate to the state of the macro-economy (real GDP growth rate and inflation) and the economy's trade-orientation proxied the share of trade in GDP. These are not the only relevant structural factors, but they appear in most of the literature and are more relevant to the developing world context.

Our story may now be graphically sketched out as shown in Figure 4.3, to illustrate the direction of possible correlations and causations. In this Figure we only illustrate possible linear linkages among the variables and all non-linear relationships will be addressed in subsequent empirical sections. Our key influences appear in shaded boxes, with arrows showing the direction of the association with the deficit.

Figure 4.3: The core model



4.4.1 Model specification

To estimate empirically the association between the various explanatory variables and our dependent variable as hypothesised above and reflected in Figure 4.3, we now need to specify the estimating model. The mapping from the variables in Figure 4.3 to our proposed estimating model is as in Table 4.4.

Table 4.4: Notation

Factor	Variable(s)	Notation	Description
Dependent variable Fiscal performance	Fiscal balance Government revenues Public expenditure	$Fiscal$ T Exp	Fiscal balance, *difference* between government revenues and expenditure, (% of GDP) Total government revenues, excluding grants (% of GDP) Total government expenditure (% of GDP)
Independent variables			
Political business cycle related factors	Election and post-election year(s) dummy variables	$Elect$ $Postelect1$ $Postelect2$	Dummy variable for election year, equal to 1 in an election year and 0 otherwise; Dummy variable for one year after election, equal to 1 and 0 otherwise; Dummy variable for two years after election, equal to 1 in year two after election and 0 otherwise
Natural resource endowments	Natural resource rents (% of GDP)	$Natres$	The proxy for the natural resource dependence is measured by total natural resources rents. It is the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.
Domestic institutions	Bureaucratic effectiveness Control of corruption	$Bureau$ $Corrupt$	State capacity measured by the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of

			corruption, as well as "capture" of the state by elites and private interests
External actors	Official development assistance (% of GNI)	Aid	a measure of external influences represented by aid and IMF/World Bank policies);
Other controls	State of the macro-economy	$Trade$ GDP Inf	An indicator of the economy's trade-orientation is the sum of exports and imports (% of GDP). Real GDP per capita measuring the level of development Inflation rate, the average consumer price index measures changes in domestic prices (annual %)

Drawing upon Nordhaus (1975), Rogoff (1990), Schuknecht (1996), Shi and Svensson (2000), Block (2002) and others, our baseline estimating equation derived from Figure 4.3 and Table 4.3, can be specified as a linear relationship, where all our key right-hand variables enter independently and can be expressed in a functional form as specified in equation (4.1):

$$Fiscal_{it} = \beta_0 + \beta_{1t} Fiscal_{it-1} + \theta PBC_{it} + \varphi Natres_{it} + \psi Bureau_{it} + \delta Corrupt_{it} + \beta_{2t} Aid_{it} + \omega Controls_{it} + \mu_t + \gamma_i + \varepsilon_{it} \quad (4.1)$$

where i stands for country and t for the year in which the variable was observed.

$Controls_{it}$ = represents variables relating to the state of the macroeconomy, in particular trade, real GDP per capita and inflation. GDP per capita is included to the positive capture the impact of economic development on the budget deficits, as the literature posits that an economy that is growing will tend to have smaller deficits. We also include the share of international trade in the economy to capture the effects of economic globalization.

μ_i = captures unobservable country-specific fixed effects not captured by the other explanatory variables, thus helping in reducing omitted variable bias;

λ_t = captures unobservable time-specific fixed effects, and also contributes to reducing omitted variable biases; and

ε_{it} = is an independent and identically distributed error term.

As stated in our hypotheses, coefficients of interest in our baseline estimating regression model (equation 4.2) are those on variables *PBC* (θ), *Bureau* (φ), *Corrupt* (δ), *Natres* (ψ) and *Aid* (β_{3t}). Before estimating equation (4.1), we wish to clarify how the variable PBC_{it} is measured. As mentioned earlier, this variable is measured by three dummy variables:

$$PBC_{it} = Elect_{it} + Postelect1_{it} + Postelect2_{it}$$

where:

$$Elect_{it} = \begin{cases} 1, & if\ t\ is\ an\ election\ year \\ 0, & otherwise\ (other\ years) \end{cases}$$

and

$$Postelect1_{it} = \begin{cases} 1, & if\ t\ is\ a\ year\ after\ election \\ 0, & otherwise\ (other\ years) \end{cases}$$

$$Postelect2_{it} = \begin{cases} 1, & if\ t\ is\ 2\ years\ after\ election \\ 0, & otherwise\ (other\ years) \end{cases}$$

Specifying how the variable PBC is measured allows for testing empirically the effects of opportunistic behaviour by re-election motivated political leaders and parties. This enables us to test for the existence of a ratchet which may underlie political business cycles in developing countries where expansionary fiscal policies allowed during the pre-election period are not compensated adequately by contractionary fiscal consolidation during the year after the election. The estimated coefficient on the variable $Elect$ measures the impact of an election on fiscal deficits. The inclusion of the variable $Postelect$ will allow for testing empirically our key hypothesis developed in the previous section, namely that fiscal deficits can get out of control and become persistent because there is a ratchet underlying political business cycles in fiscal variables:

public expenditure increases during the pre-election periods but are not compensated by precautionary expenditure cuts or tax increases during the year after the election. To understand which component(s) of the fiscal deficit is frequently manipulated, requires testing the impact of PBCs on tax revenues and public expenditure. The empirical specification for testing this requires making each of these a dependent variable.

Estimating our baseline linear dynamic model (equation 4.1) using standard OLS is likely to bias the estimated coefficients because the inclusion of a lagged dependent variable as one of the regressors is endogenous with respect to the country-specific fixed effects. OLS estimates will be inconsistent because the lagged dependent variable is correlated with the error term (Arellano and Bond, 1991). OLS estimates with Huber–White standard errors are, therefore, reported for comparison only. Although the bias might diminish when the number of periods increases, our panel data is unbalanced and the average number of observations per country in most regressions is not large enough, thus it would seem reasonable to employ more robust estimators. Here our primary estimation technique is the robust *Fixed Effects* estimator (FE) with White standard errors which can address biases caused by unobserved heterogeneity and omitted variables. We also employ an instrumental variable estimator, three-stage least squares to try and address any potential endogeneity due to reverse causality and simultaneities. The statistical software used is Stata/IC 14.2

4.4.2 Data description and summary statistics

This section provides a description of the dataset used in this study to test the hypotheses stated above. The data comprises an unbalanced panel of 42 African countries, spanning over three decades, from 1980 to 2017. It is unbalanced because some of the variables have missing data in certain years. All the variables used in this study are based on annual observations. Our sample includes most of the countries from sub-Saharan Africa (with the exception Equatorial Guinea, Eritrea, Liberia and South Sudan). These countries are relatively homogenous geographically, in economic structures (most of them heavily dependent on natural resources) and politically many of them recently democratised and now have more frequent and fairer elections, thereby making them suitable for such a study. The choice of countries has been informed by data availability. We

employ a dataset obtained primarily from the World Bank's *World Development Indicators* and the International Monetary Fund's *World Development Outlook* database. Other sources of our data include: the African Election Database and the Centre for Systemic Peace's Polity IV dataset. Table 4.4 below shows a summary of the variables in our study.

Our primary dependent variable is the fiscal balance ($Fiscal$) from the *World Economic Outlook Database* published by the IMF. It measures a country's fiscal balance in a given year and represents its net lending (surplus) or net borrowing (deficit) position. This is calculated as revenue minus total expenditure. According to the IMF the fiscal balance measures the extent to which general government is either putting financial resources at the disposal of other sectors in the economy (net lending) or utilizing the financial resources generated by other sectors and (net borrowing). This balance is calculated excluding grants from aid donors.

To understand which components of the fiscal deficit are commonly manipulated during elections, we also use the shares of total government general revenues (Tax_{it}) and total government general expenditure ($Expend_{it}$) in GDP as dependent variables. General government revenue (percent of GDP) is general government total revenue without grants as a share of GDP, including tax and other revenue (from property income, interest payments, sales of goods and services, and so forth) and general government total expenditure (percent of GDP) consists of total expense net acquisition of nonfinancial assets. These data series are from the IMF's World Economic Outlook database published in October 2018.

The dummy variable $Elect_{it}$ is coded as 1 if country i held national elections at time t and 0 for all other years. The dummy variable $Postelect_{it}$ takes the value of 1 in country i when t is a year following an election and 0 otherwise. We use the dataset from the Database of Political Institutions (2018) and the African Elections Database and, drawing upon the practice in the literature, these variables only relate to highest national elections in a given country. We only focus on legislative, parliamentary and presidential elections (see for example Shi and Svensson, 2006; Brender and Drazen, 2008; Ebeke and Ölçer, 2013). The data shows that on average a country in Africa holds national elections every five years, and from 1980 to 2017, there were around 325 national elections in the 42 countries in our sample. Some analysts argue that some of the elections

held in the 1980s, particularly in Africa, should not be included in the sample because they lacked competition and, therefore, are not likely to produce *'political business cycles'* (Block *et al*., 2003). We make no such adjustment here because we would like our results to be comparable to previous findings where no such adjustments are made, and secondly because detailed data on political systems and electoral competition is not available for a number of the countries in our sample prior to the 1990s.

Natural resource endowments $(Natres_{it})$, are defined as the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents, expressed as a percent of GDP. The data for this variable is from the World Bank's *World Development Indicators* published in 2018.

The influence of domestic institutions is measured by two variables: Bureaucratic effectiveness $(Bureau_{it})$ measures the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies; and Control of Corruption, $(Corrupt_{it})$ captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. These data are from the International Country Risk Guide (ICRG) dataset.

The influence of external actors is the measured by the share of net official development assistance in gross national income. The ODA consists of disbursements of loans made on concessional terms and grants by official agencies of the members of the Development Assistance Committee, by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent). The data is from the World Bank's *World Development Indicators* for 2018. The World Bank's Development Policy Lending consists of loans or grants that are accompanied with conditions that take the form of prior actions, triggers and benchmarks. IMF loans are in theory provided to countries facing balance of payment problems. They are accompanied by conditions that take the

form of prior actions, quantitative performance criteria, indicative targets and structural benchmarks. It is often difficult for recipient countries to refuse the implementation of IMF's policy prescriptions in the context of an IMF loan. Bilateral and multilateral donors tend to favour countries with IMF programmes. IMF assessments are also used by donors to make aid allocation decisions, especially in low-income countries, where they often lack information on the country's situation.

Apart from our key variables of interest, we also include the lagged dependent variable as one of the control variables to capture the sluggish dynamics associated with government fiscal policy decisions, which are constrained by public budgets and bureaucracies (Beck and Katz, 1995; Bodea, 2013). It is also argued that current budgets are largely determined by previous appropriations (Schuknecht, 2000: 121). Based on the literature discussed in the literature survey section, we include the lagged dependent variable, inflation, GDP per capita and openness to international trade as independent variables. As stated earlier, the data on all our dependent variables is from the *World Economic Outlook* database published by the IMF (WEO, 2018). The data for GDP per capita and openness to international trade are from the *World Development Indicators* published in 2018. The data and variables discussed here are summarised and reported in Table 4.5.

Table 4.5 Summary statistics

Variable	Mean	Std. Dev.	Min	Max	Source
Fiscal balance (deficit/surplus)	-2.1	5.2	-25.7	40.3	*World Economic outlook* (IMF)
Election year dummy	0.2	0.4	0.0	1.0	*Database of political institutions* (World Bank)
Post-election year dummy	0.2	0.4	0.0	1.0	*Database of political institutions* (World Bank)
Two years post-election dummy	0.2	0.4	0.0	1.0	*Database of political institutions* (World Bank)
Natural resource rents	13.7	11.9	0.0	61.9	*World Development Indicators* (World Bank)
Bureaucratic effectiveness	1.3	0.8	0.0	3.5	*Worldwide Governance Indicators* (World Bank)
Control of corruption	2.2	0.9	0.0	5.0	*Worldwide Governance Indicators* (World Bank
Net Official development assistance (% of GNI)	9.5	9.6	-0.2	78.7	*World Development Indicators* (World Bank)
Trade (% of GDP)	64.8	26.2	11.1	165.6	*World Development Indicators* (World Bank)

GDP per capita, PPP (current international $)	3,571.0	4,054.4	276.2	21,356.0	*World Development Indicators* (World Bank)
Total population size (million)	21.9	27.8	0.95	186.0	*World Development Indicators* (World Bank)
Inflation, consumer prices (annual %)	157.9	313.2	0.3	3,234.8	*World Development Indicators* (World Bank)
Imports of goods and services (% of GDP)	35.8	13.4	7.1	96.4	*World Development Indicators* (World Bank)
Exports of goods and services (% of GDP)	29.0	18.1	2.5	108.0	*World Development Indicators* (World Bank)

4.5 Empirical findings – quantitative results

In this section we present and discuss the findings which address the hypotheses stated above. The two important diagnostics which we conduct are the tests for the presence of heteroscedasticity and serial correlation, both of which can bias the estimates and invalidate statistical tests of significance if not taken care of. To test for the presence of heteroscedasticity, we employ the Breusch–Pagan test. Our diagnostics confirms possible presence of heteroscedasticity as the null hypothesis of homoscedasticity is rejected at 1 percent significance level (Prob > chi2 = 0.0000). We also test for the presence of serial correlation. The null hypothesis for the absence of first order autocorrelation is also rejected as Prob > F = 0.0000. To deal with these problems, we estimate all our models with robust standard errors clustered by country so that the estimated coefficients are robust with respect to heteroscedasticity and arbitrary autocorrelations. Table 4.6 presents the results for the two estimators, a pooled OLS estimator with Huber-White heteroscedasticity consistent standard errors and a more efficient Fixed Effects estimator, our main estimating strategy in this study. We also estimate a system of equations using an instrumental variable estimator *3SLS* in later sections as a robustness test of our findings to reverse causality and simultaneities.

4.5.1 Baseline regression results

In this section, we present and discuss our baseline findings. Table 4.6 presents the results from the robust *OLS* and the *fixed effects* based on equation (4.1). In columns (1) and (2), we show the results on the impact of our explanatory variables on the overall fiscal balance. The results of the impact of the same variables on taxation are reported in columns (3) and (4) with the final two columns (5) and (6) showing the impact on public expenditure. We start our empirical tests and

analysis by first assessing the existence of *'political business cycles*' in fiscal deficits in Africa. The results from our two estimators indicate that the estimated coefficient on the variable $Elect_{i,t}$, our measure of the election-related fiscal manipulation, is negative and statistically different from zero at the standard 5 percent significance level. This implies that on average, fiscal deficits are larger in election years than in other years by between 0.9 and 1.1 percentage points of GDP. In our view, this confirms previous findings in the literature that governments in Africa engage in opportunistic manipulation of fiscal policy for re-election purposes, and as columns (3) to (6) show, the typical instrument utilised for this purpose is public expenditure. On average, public expenditure increases in election years by 0.7-0.8 percentage points of GDP relative to non-election years. We find no evidence that tax policy is used for re-election purposes. Although its estimated coefficient is negative, it is insignificant across all specifications.

The next issue we wish to examine is whether the pre-election fiscal boost is counterbalanced by adequate post-election cutbacks as claimed by the '*political business cycle'* hypothesis. We observe the estimated coefficients on the two post-election dummies: $Postelect1$ and $Postelect2$. The results indicate that there is an effort to bring fiscal deficits down in the year following the election, but this does not have a statistically significant effect on the deficit. The effort to reduce fiscal deficits is confirmed by the negative and statistically significant coefficient on the variable $Postelect1$ in the expenditure columns (5) and (6). However, the lack of a symmetrical effect on the E*lect* and $Postelect1$ in columns (1) and (2) suggests that election-linked fiscal deficits may last beyond the post-election year as efforts made by governments during the year after elections fall short of what is required to close the budgetary gaps entertained during the election.

To understand whether, because austerity measures are politically sensitive and governments may tend to be cautious about the time within which to implemented cutbacks, we consider the conduct of fiscal policies two years after the election, which is a reasonable period within which to expect some government effort to deflate the deficit. The estimated coefficient on the variable $Postelect2$ shows no sign of such effort, as it emerges negative but insignificant. Qualitatively, these results may be suggesting that the post-election contractionary measures that are implemented are not adequate and balanced enough to bring election year deficits down. We, therefore, conclude that the inability to implement painful fiscal austerity measures which can

adequately rebuild fiscal buffers eroded during elections, represents a possible reason why '*political business cycles*' contribute to the difficulties in controlling fiscal deficits in Africa. Our findings differ from those of Block (2002) and others.

Table 4.6 Political business cycles, natural resources, domestic and external institutions

Estimation method	**OLS (1)**	**FE (2)**	**OLS (3)**	**FE (4)**	**OLS (5)**	**FE (6)**
Dependent variable:	*Fiscal*		*Tax*		*Expend*	
Explanatory variables:						
Lagged dependent variable (FD_{it-1})	0.45***	0.40***	0.70***	0.45***	0.83***	0.72***
	(6.03)	(4.03)	(11.11)	(5.60)	(19.68)	(15.11)
Election-year dummy ($Elect_{it}$)	-1.05***	-0.91**	-0.44	-0.10	0.71**	0.81**
	(2.67)	(2.10)	(1.08)	(0.22)	(2.30)	(2.15)
One-year post-election dummy ($Postelect1_{it}$)	0.41	0.47	-0.09	0.04	-0.72**	-0.60***
	(1.03)	(1.29)	(0.23)	(0.10)	(2.25)	(3.01)
Two years post-election dummy ($Postelect2_{it}$)	-0.25	-0.15	-0.10	0.13	0.31	0.37
	(0.52)	(0.32)	(0.22)	(0.33)	(1.01)	(1.39)
Natural resource rents, current value ($Natrent_{it}$)	0.16***	0.19**	0.08***	0.16***	-0.05	-0.02
	(4.12)	(2.65)	(2.60)	(3.01)	(1.46)	(0.41)
Natural resource rents lagged 2 years ($Natres_{it-2}$)	-0.12***	-0.09***	-0.06*	0.01	0.04	0.09***
	(3.20)	(4.64)	(1.84)	(0.44)	(1.38)	(3.20)
Bureaucratic effectiveness	-0.46*	-0.65	0.22	-0.33	0.25	-0.11
	(1.86)	(1.44)	(0.93)	(1.10)	(1.18)	(0.26)
Capacity to control corruption	-0.20	-0.57**	0.02	-0.36	0.10	0.00
	(0.97)	(2.18)	(0.08)	(0.84)	(0.51)	(0.01)
Donor aid (Aid_{it})	-0.01	0.004	0.04*	0.04	0.04	0.03
	(0.52)	(0.11)	(1.78)	(1.46)	(1.52)	(1.04)
Trade orientation of economy ($Trade_{it}$)	-0.01	0.005	0.04***	0.03*	0.03***	0.02
	(0.77)	(0.42)	(4.03)	(1.96)	(3.25)	(1.59)
Level of economic development (GDP_{it})	0.0001**	0.0004	0.0002***	0.00	0.00	0.00
	(2.34)	(1.40)	(3.11)	(0.07)	(1.31)	(0.78)
Time-specific fixed effects (γ_t)	-0.03	-0.05*	0.02	0.03	0.03	0.03
	(1.58)	(1.87)	(1.06)	(0.92)	(1.16)	(0.83)
Constant	63.86	109.17*	-40.85	-58.54	-55.89	-55.42
	(1.56)	(1.90)	(1.02)	(0.84)	(1.14)	(0.80)
Observations	656	656	656	656	672	672
R-squared	0.3092	0.2483	0.7421	0.3579	0.8393	0.6000
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Asterisks ***, ** and * denote level of significance at 1%, 5% and 10% respectively. Both the pooled OLS and Fixed Effects *t*-statistics, which are reported in the parentheses, are white-heteroscedastic-corrected. See data description and sources in Table 4.4. The joint F tests show that all the coefficients in our models are jointly different from zero. All estimations including the pooled OLS are done with heteroscedasticity and autocorrelation (White) robust standard errors with t-values reported in the parentheses. Significance levels are indicated as 1% (***), 5% (**) and 10% (*).

We now turn to the short- and medium-term effects of natural resource endowments. Our results show that natural resource endowments are consistently associated with fiscal deficits. An increase in resource rents helps to finance the deficits by boosting current revenue inflows, as the

estimated coefficients on the variable $Natres$ in columns (1)-(4) is positive and statistically significant. A one percentage point increase leads to a 0.08-0.16 percentage point increase in revenues and a 0.16-0.19 percentage point reduction in the fiscal deficit. This finding of a positive contemporaneous (or short-term) effect on revenues and fiscal balances, is consistent with recent findings by Morrissey *et al.* (2016). However, our interest is also to understand the medium-term impact, which in this case is captured by the lagged values of the natural resource variable, $Natres_{it-2}$. The choice of 2 years, though short and somewhat arbitrary, is informed by the fact that resource revenues tend to be very volatile. The estimated coefficient on the variable $Natres_{it-2}$, is negative for deficits indicating that a 1 percentage point increase in resource rents leads to an increase in the deficit of 0.09-0.12 percentage points 2 years later and this is driven by a fall in revenues (of 0.06 for OLS) and an increase in expenditure (of 0.09 for FE). One possible interpretation of this result is that, although natural resource booms may have a positive contemporaneous effect and help in driving fiscal deficits down at the beginning of a boom, over the medium-term they tend to complicate government control over fiscal policies in Africa due to poor management of resources and lack of investment capacity. We attempt to address these issues by identifying some of the factors which may lead natural resource endowments to compromise government control over the budget, in the case study section.

Finally, we consider the question of whether domestic and external institutions, in particular bureaucratic effectiveness, control of corruption and foreign aid have played any restraining role and promoted fiscal discipline in Africa. The estimated coefficients suggest that the inability to control corruption has a negative effect on fiscal deficits (though the impact is weak). We find no role of the direct impact of bureaucratic effectiveness as its estimated coefficient is but statistically significant. The evidence also suggests that although the coefficient on the coefficient on foreign aid emerges as positive, on balance it remains largely insignificant, possibly suggesting that the use of aid to influence domestic fiscal policies has not been successful fostering fiscal discipline in Africa. This evidence points to the possibility that in Africa fiscal discipline is being further compromised by the erosion of the restraining influence of aid donors and international financial institutions, as developing countries increasingly resort to alternative ways of financing fiscal deficits. We attempt to address this issue in the case study section.

Other results for our control variables show that the lagged dependent variable emerges with a strong positive and statistically significant coefficient across all specifications. The result is statistically significant at the 1 percent level. Our proxy for the level of development, GDP per capita, emerges with the expected positive sign at 10 percent significant level (in other words, more developed countries run lower deficits), but the size of the impact on revenue is marginal, while the role of foreign trade is ambiguous here.

4.5.2 Addressing possible endogeneity

Our analysis so far does not take into account the interrelationships we have conjectured earlier, such as the link from natural resource intensity to the weakness institutions and the influence of aid on governance, which may have an impact on our findings. These interrelationships cannot be estimated using our baseline single model in equation 4.1. The other problem in our baseline model is that two of our independent variables may be endogenous, as they are possibly influenced by other variables outside the model: domestic institutions and foreign aid. To take these potential endogeneity issues into account, we propose to model the interlinkages between the independent variables as separate relationships as shown in equations 4.2 and 4.3, then re-estimate the three equations (4.1, 4.2 and 4.3) as a system of three simultaneous equations. Our first model in the proposed system of equations restates our baseline equation 4.1 as follows:

$$Fiscal_{it} = \beta_0 + \beta_{1t}Fiscal_{it-1} + \theta PBC_{it} + \varphi Natres_{it} + \psi Bureau_{it} + \delta Corrupt_{it} + \beta_{2t}Aid_{it} + \omega Controls_{it} + \mu_t + \gamma_i + \varepsilon_{it} \quad (4.1)$$

The second equation, 4.2, estimates the impact of the natural resource curse on the capacity of the state, which in the political natural resource curse literature, and in this study, has been hypothesised to weaken the capacity of state institutions. Equation 4.2 is also intended to capture the increasing role of governance (or attempts at it) in the budgets and practice of aid agencies. As discussed earlier, aid donors have shifted their influence from policy to governance, as they seem to have realised that the problem of economic underdevelopment in Africa is not poor policies only, but also the lack of capacity to implement policies often due ill-trained or inadequately

trained and corrupt government officials. Thus, they have been enthusiastic in intervening in influential ministries such as finance.

$$Bureau_{it} = \alpha_0 + \alpha_{1t}Natres_{it} + \alpha_{2t}Aid_{it} + \alpha_{3t}GDP_{it} + \mu_t + \gamma_i + \varepsilon_{it} \quad (4.2)$$

Finally, the level of aid is also, as documented by a large literature, endogenous to other factors such as the level of development (less goes to richer and faster-growing countries), the state of the macro-economy (less goes to profligate governments) and population size (Lenton *et al*., 2016). Our final equation, 4.3, captures these important influences of foreign aid.

$$Aid_{it} = \delta_0 + \delta_{1t}GDP_{it} + \delta_{2t}Inf_{it} + \delta_{3t}Pop_{it} + \mu_t + \gamma_i + \varepsilon_{it} \quad (4.3)$$

In order to capture these simultaneities, we re-estimate our baseline equation and the other two new equations as a system of equations employing an instrumental variable estimator, three-stage least squares (3SLS). The 3SLS estimator is a form of instrumental variable that has the advantage of being asymptotically more efficient than the 2SLS we have utilised in Chapter 3. The 3SLS is ideal in this case because we are dealing with non-linear structural relationships. The findings are summarised and reported in Table 4.7. Estimates of the three specifications show that the coefficients on the political business cycle factors, natural resource curse related factors, state capacity and external influences remain qualitatively similar to those established earlier in our analysis (i.e. the expected post-election expenditure cutback still does not happen, and natural resource intensity and bureaucratic effectiveness are still negative influences reinforcing budget deficits even when these endogeneities are incorporated into the model[45]. Since the overidentification tests are failed, the 3SLS findings do not add much to our previous analysis.

[45] In our 3SLS regressions, the instruments are the lagged values of the endogenous variables (fiscal balance, bureaucratic capacity, and aid conditionality). Using lagged values of endogenous variables as instruments could potentially create a problem if those lagged values are also endogenous. However, the tests for overidentification restrictions carried out in Table 4.7 reject the joint null hypothesis that the instruments are valid, suggesting that the systems of equations might be weak.

Table 4.7. Possible influences of fiscal deficits – estimating a system of equations [3SLS]

Dependent variables: Independent variables	Fiscal balance	Bureaucratic capacity	Aid
Lagged dependent variable ($Fiscal_{it-1}$)	0.45** (13.07)		
Political business cycles			
Election-year dummy ($Elect_{it}$)	-1.05*** (2.56)		
One-year post-election dummy ($Postelect1_{it}$)	0.41 (1.01)		
Two years post-election dummy ($Postelect2_{it}$)	-0.25 (0.59)		
Natural resource curse related factors			
Natural resource rents ($Natrent_{it}$)	0.16*** (5.60)	-0.02*** (6.53)	
Natural resource rents lagged 2 years ($Natrent_{it-2}$)	-0.12*** (4.24)		
State capacity related factors			
Bureaucratic capacity	-0.46* (1.84)		
Capacity to control corruption	-0.20 (0.91)		
Influence of external actors			
Donor aid ($AidCond_{it}$)	-0.01 (0.49)	-0.001 (0.24)	
Other controls			
Trade orientation of economy ($Trade_{it}$)	-0.01 (0.83)		
Level of economic development (GDP_{it})	0.0001*** (2.58)	0.0001*** (9.74)	-0.001*** (7.21)
Inflation rate			-0.003 (0.91)
Time-specific fixed effects (γ_t)	-0.03 (1.23)	-0.02*** (6.01)	
Population size			-0.50*** (3.90)
Constant	63.63 (1.22)	45.29 6.18	38.44*** (5.88)
Observations	656	656	656
R-squared	0.3092	0.2011	0.1967
Prob > F	0.0000	0.0000	0.0000
Hansen-Sargan overidentification statistic			
(chi-square)	64.528	65.913	55.996
(p-value)	0.000	0.0000	0.0000

Notes: Asterisks ***, ** and * denote level of significance at 1%, 5% and 10% respectively. See data description and sources in Table 4.4. The joint F tests show that all the coefficients in our models are jointly different from zero.

4.5.3 Robustness check – different estimation method

In this section we use a different estimation method, the *random effects* estimator assess the sensitivity of the key findings, in particular the extent to which pre-election fiscal boosts are counterbalanced by post-election cutbacks to try and bring fiscal deficits down; the medium-term negative effects of how natural resource endowments; and the role of domestic and external institutions in promoting fiscal discipline. The random effects estimator has been applied in similar studies (Bove *et al.*, 2016). Using the random effects estimator has the advantage of controlling for country-specific time trends. A Hausman test conducted in Table 4.8 indicates that the model with random effects is preferable to the fixed effects. We estimate the random effects specification and use heteroscedasticity and autocorrelation consistent standard errors to calculate the corresponding test statistics. The results which are reported in Table 4.8 show that our variables are robust to a different estimation method.

Table 4.8: Robustness check – Fixed Effects vs Random Effects estimators

Estimation method **Explanatory variables:**	**FE**	**RE**
Lagged dependent variable ($Fiscal_{it-1}$)	0.398***	0.448***
	(11.000)	(12.940)
Election-year dummy ($Elect_{it}$)	-0.914**	-1.048**
	(2.120)	(2.540)
Election-year dummy ($Elect_{it}$)	0.471	0.412
	(1.100)	(1.000)
Two years post-election dummy ($Postelect2_{it}$)	-0.152	-0.246
	(0.350)	(0.590)
Natural resource rents, current value ($Natrent_{it}$)	0.191***	0.165***
	(5.410)	(5.540)
Natural resource rents lagged 2 years ($Natres_{it-2}$)	-0.087**	-0.117***
	(2.510)	(4.200)
Bureaucratic effectiveness	-0.651	-0.455*
	(1.360)	(1.820)
Capacity to control corruption	-0.569*	-0.201
	(1.740)	(0.900)
Donor aid (Aid_{it})	0.004	-0.012
	(0.140)	(0.570)
Trade orientation of economy ($Trade_{it}$)	-0.005	-0.007
	(0.330)	(0.820)

Level of economic development (GDP_{it})	0.000	0.000**
	(1.510)	(2.520)
Time-specific fixed effects (γ_t)	-0.054	-0.032
	(1.560)	(1.220)
Constant	9.171	6.861
	(1.580)	(1.210)
Observations	656	656
R-squared	0.2483	0.3092
Hausman test of efficiency chi2 Prob>chi2	2603 0.0106	
Prob > F	0.0000	0.0000

4.6 Qualitative findings: Zambia case study

The quantitative analysis conducted in the previous section suggests that 'political business cycles' are present in Africa (as suggested by the negative and statistically significant coefficient on the election year variable $Elect$), but that this has contributed to the difficulty of managing the deficit as pre-election surges are adequately counterbalanced by post-election cutbacks (in this case up to two years), presenting African governments with an unpleasant choice of surrendering to the cycle and thus causing a temporary deficit to persist. The results also show that natural resource intensity has imposed medium-term fiscal costs, and that domestic and external institutions have only had a very weak effect on fiscal deficits. Our aim in this section is to add a detailed country-specific context to try and gain some insights into the causal factors, focussing on these three ideas using the Zambian economy and its weak ability, even by African standards, to control the fiscal deficit in recent years (as illustrated in Table 4.2 above).

As indicated earlier, the approach in this section is different as its mainly based on qualitative analysis using data from various sources, including ministries of finance (MoF) and mines and minerals development (MMMD) Zambia Revenue Authority, Central Statistical Office (CSO) and IMF Zambia office, during the periods 11-29 June 2018 and 7-21 January 2019.

For various reasons, Zambia presents an ideal setting for exploring some of the causal factors underlying the correlations that have been developed and documented in the previous sections. First, the country's democratic progression, like several of its peers on the continent, has been

considered by several commentators as fairly successful, practically transitioning from almost three decades of an autocratic one-party state in the 1970s to the early 1990s, to a dominant party system of the 1990s and early 2000s, and later to multi-party system of governance since the mid-2000s. The chronology of the country's democratic progression provided in Table 4.9, shows that there are competitive and cleaner elections, especially from the mid-2000s. With more frequent and competitive elections, the theories outlined above suggest the possibility that this may hurt fiscal performance due to the incentive to the strong incentive to manipulate policies for re-election purposes. Second, Zambia has historically been a natural resource-intensive country with copper mining accounting for the largest share of its foreign export earnings since the 1920s. Although the contribution of the mining sector to export earnings has declined over the years, from over 90 percent in the 1970s, it still remains the largest contributor estimated at about 70 percent in 2017 - indicating little diversification (IMF, 2017). With this level of natural resource-intensity, Zambia, like many African countries, has certainly been exposed to the vagaries of the '*natural resource curse'*, and its policy responses to the 'boom-bust' cycles and how it has managed resource revenues and rent-seeking behaviour and corruption will be crucial in our understanding of the impact, in practice, of natural resource endowments on fiscal management. Third, on the international scene, Zambia has historically had a weak relations with donors characterised by weak implementation and intermittent suspensions of donor-supported policy reforms in the 1980s, a more favourable experience in the 1990s and 2000s during which donors had a relatively strong influence on the country's economic policies and (liberalisation) reforms. In this period, the country experienced marked improvements in a number of economic, and assistance was almost always provided with conditionality attached. Since 2011, the country has been zigzagging backwards and forwards between aid donors, somewhat diluting the influence of traditional multilateral and bilateral donors. Finally, in terms of fiscal performance, Zambia's fiscal deficits as indicated in Figure 4.3 had improved from the 1990s until the mid-2000s, but more recently appear to have become difficult to control, and the country is experiencing some of the worst deteriorations in fiscal deficits on the continent, as shown in the bottom part of Table 4.2 above. Most recently, the country was reclassified by the IMF in 2015 to be among those at the highest risk of debt distress and while all the reputable international rating agencies (Moody's, Standards and Poor's and Fitch) have downgraded the country's credit rating primarily because of the deteriorating fiscal deficits.

This objective in this section is to understand the extent to which our quantitative findings explain fiscal developments in a typical African country such as Zambia, and to identify possible causal factors which may underlie the weak ability to manage fiscal deficits but do not show in the econometric results, focussing on the '*political business cycles*', natural resource endowments, and the role of aid donors. We seek to assess the extent to which these three factors have contributed towards Zambia's weak ability to manage fiscal deficits.

4.6.1 Political business cycles

Zambia presents an ideal setting for the study of opportunistic 'Nordhaus-type' rather partisanship 'Hibbs-type' models because most of the elections have been based more on opportunism and less on political party ideologies. For instance, van Donge (1995) describes the election campaigns of 1991 as having centred around the personality characteristics of the main players. Chikulo (1993: p.90) asserts that 'although the campaigns leading to the 1991 elections were emotionally charged, what was less encouraging was the lack of any issue-based, issue-oriented debate: there was no serious campaigning on the basis of tangible issues.' Burnell (2002: p. 1111) claims that 'by focusing on Chiluba personally the opposition were diverted from targeting the MMD government's poor socioeconomic performance'. The BBC observes that 'newspaper headlines and radio shows have been dominated by personality politics in the 2016 election run-up … with little debate on real policies.' (BBC: 10 August 2016).

During the first four years of independence, Zambia functioned as a multi-party democracy and successfully held one presidential-and-national assembly election in 1968 contested by more than two political parties. This election was won by Kenneth Kaunda's United National Independence Party (UNIP), who became increasingly authoritarian and intolerant to opposition, which led to the abolition of multi-partyism and the introduction of a one-party system of government on 8th December 1972. During the 20-year one-party state, a total of four elections were arranged and conducted with virtually no credible electoral competition. The return to the multi-party system in 1990 was led by powerful interest groups, predominantly from the labour movement, faith-based organisations and a consortium of non-governmental organisations who organised a mass-based popular movement against UNIP's mismanagement of the country and

monopoly on power, in a classic episode that illustrates the political influence of interest groups and state weakness in Zambia. The mass-based popular protests of this time forced the UNIP government to abandon the one-party system of democracy and re-introduced multi-party democracy on 4th December 1990 (*Times of Zambia*, 1990), in the form of elections on 31st October 1991.

Between 1992 and 2005, the country functioned as a dominant-party democracy with Fredrick Chiluba's Movement for Multi-Party Democracy (MMD), which had won the first elections after the return to multi-party democracy, enjoying majority seats in the national assembly. An attempt by Chiluba in early 2001 to amend the constitution so as to allow him to seek a third term (which he had imposed in 1996 aimed at eliminating Kaunda and other prominent opposition leaders) was met with widespread opposition by interest groups (opposition parties and civil society). Since then, as shown in Table 4.9, the country has enjoyed relatively stable democracy: having successfully held a total of eight presidential and/or national assembly elections and peacefully transferred power between different governments, UNIP-to-MMD (1991) and MMD-to Patriotic Front (2011). On this score, Zambia has been ranked as one of the most democratic countries in Africa (no. 9 out of 54) and just slightly above the world average (no. 86 out of 167) (Economist Intelligence Unit, 2018; Freedom House, 2018).

Table 4.9 General elections in Zambia (1964-2016)

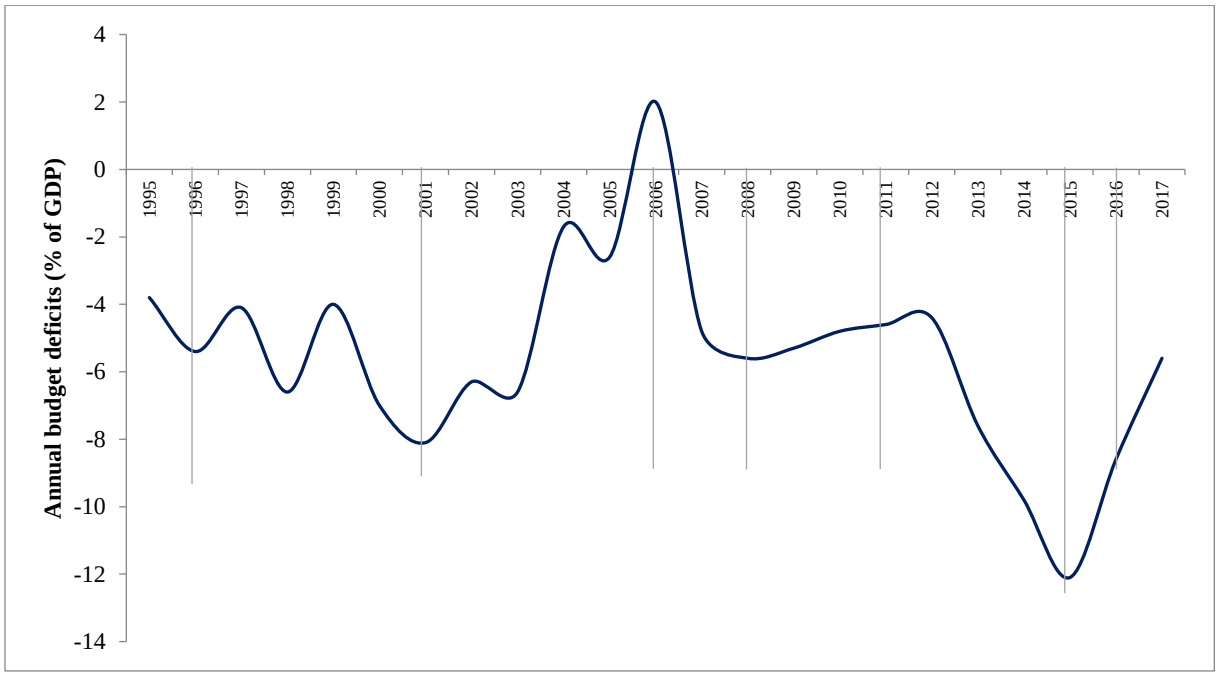
Election dates	**Participating political parties**	**System of government**
20-21 January 1964; Legislative Council Election	UNIP (55), ANC (10), NPP, Independents	Multi-party
19th December 1968; Presidential and national assembly elections	UNIP (81), ANC (23), Independents (1)	Multi-party
5th December 1973: Single party presidential and national assembly elections	UNIP	One-party
12th December 1978: Single party presidential and national assembly elections	UNIP	One-party
27th October 1983: Single party presidential and national assembly elections	UNIP	One-party
26th October 1988: Single party presidential and national assembly elections	UNIP	One-party
31st October 1991: Presidential and national assembly elections	UNIP (25), MMD (125)	Dominant party

18th November 1996: Presidential and national assembly elections	MMD (131), ZDC (5), NP (2), AZ (2), MDP (0), Independents (10)	Dominant party
27th December 2001: Presidential and national assembly elections	MMD (69), UPND (49), FDD (12), UNIP (13), HP (4), ZRP (1), PF (1), NCC, SDP, AZ, NLD, Independents (1)	Multi-party
28th September 2006: Presidential and national assembly elections	MMD (72), PF (44), UDA (27), ULP (2), NDF (1), Independents (2)	Multi-party
30th October 2008: Presidential by-elections	MMD, PF, UPND, HP	Multi-party
20th September 2011: Presidential and national assembly elections	PF (60), MMD (55), UPND (28), ADD (1), FDD (1), UNIP, NMP, NAREP, ZED, NGP, NRP, HP, UPDD, NP, ZDDM, ZCP, APC, CDP, ULP, FEDEPA, Independents	Multi-party
20th January 2015: Presidential by-election	PF, MMD, UPND, UNIP, HP, FDD, GPZ, CDP, NAREP, FDA, FRP	Multi-party
11th August 2016: Presidential and national assembly elections	PF (80), UPND (58), MMD (3), FDD (1), RP, NAREP, ADD, UDF, UNIP, GPP, RRP, GPZ, UPP, Independents (14)	Multi-party

Notes: UNIP = United National Independence Party, ANC = African National Congress, NPP = National Progressive Party, MMD = Movement for Multi-Party Democracy, ZDC = Zambia Democratic Congress, NP = National Party, AZ = Agenda for Zambia, MDP = Movement for a Democratic Process, HP = Heritage Party, PF = Patriotic Front, NCC = National Citizens' Coalition, NDF = National Democratic Focus, ULP = United Liberal Party, UPND = United Party for National Development, ZED = Zambians for Empowerment and Development, NAREP = National Restoration Party, ADD = Alliance for Development and Democracy, NMP = National Movement for Progress, UPDD = Unified Party for Democracy and Development, ZDDM = Zambia Direct Democracy Movement, ZCP = Zambian Conservative Party, APC = All People's Congress Party, FEDEPA = Federal Democratic Party, GPZ = Green Party of Zambia, CDP = Christian Democratic Party, FDA = Forum for Democratic Alternatives, FRP = Fourth Revolution Party, RP = Rainbow Party, GPP = Golden Progressive Party, RRP = Radical Revolution Party,

The *'political business cycle'* theoretical framework and the results from the quantitative analysis suggest broadly that national elections in Africa often have negative macro-economic effects, as opportunistic incumbent political leaders and/or parties engage in expansionary fiscal policies and drive up fiscal deficits during election years but fail to implement adequately the deflationary part of the cycle after elections. The evidence as shown in Figure 4.3, which has been produced using data from the World Bank's *Database of Political Institutions* (2018), *African Election Database* (2012) and the *Electoral Commission of Zambia*, clearly suggests that there has been electorally-timed fiscal manipulation in Zambia since the 1990s. General elections in Zambia are conducted every 5 years to choose the President, Members of Parliament and Councillors.

Figure 4.3: Fiscal performance and general elections in Zambia (1990-2018)



Source: World Economic Outlook (2018), Database of Political Institutions (2018), African Election Database (2012), Electoral Commission of Zambia (various publications)

There are some telling episodes that fit the pattern documented by our regression analysis, suggesting that there is evidence of election-motivated fiscal manipulation in Zambia as the country's politics become increasingly more competitive. Figure 4.9 reveals clear patterns linking expansionary fiscal policies in five out of eight general elections conducted since the return of multi-partyism in 1990. These patterns also confirm our findings from the econometrics of Table 4.7, suggesting that although government have made some effort to implement post-election cutbacks, these efforts have not been adequate to deflate the economy. During the elections conducted in 1996, 2001, 2008 and 2015, a clear pattern of fiscal manipulation appears but the post-election measures do not counterbalance the extravagances entertained during election, causing temporary deficits to persist. Deficits worsened in election years and did not fully subside after elections leading to even larger deficits in subsequent elections. As is shown in Figure 4.8 cumulatively the resultant deficits from opportunistic fiscal manipulation in Zambia have been growing after 1991. For instance, the deficit of the election year 1996 is lower by 2.7 percentage points to the one in the election year 2001, and the one in 2015 is higher than in 2001 by 4 percentage points. The weak ability to implement post-election cutback have particularly been

severe after 2006 (reflecting the impact of more competitive elections). In the other three elections in 2006, 2011 and 2016 appear not to show any such patterns. On this evidence we conclude that '*political business cycles'* have contributed towards Zambia's increasing weak ability to manage and control fiscal deficits, and this has partly contributed to the massive deterioration of the deficit since the beginning of more competitive elections.

4.6.2 Natural resource endowments

As mentioned earlier, Zambia is a natural resource-dependent country with copper currently accounting for about 70 percent of export earnings. It is clearly documented that copper mining in Zambia has been central to the country's economic fortunes as well as its ills (Kalinda and Floro, 1992; Lundstøl and Isaksen, 2018). To assess what impact this has had on fiscal performance we focus on 'boom-bust' cycles and the management of resource revenues. damage to institutions. The context is that for much of the decade after independence in 1964, Zambia was seen as one of the prosperous countries on the African continent, thanks to the huge mineral deposits and the booming copper prices. However, a decade of macroeconomic shocks which started in the mid-1970s and closely associated with natural resource dependence such as a slump in copper prices, and massive increases in oil prices, conspired and sent the economy into severe macroeconomic downturn. These factors weakened government finances, significantly increased public indebtedness, the result of which was balance of payments crisis and economic decline. The continued fall in copper prices resulted in the dramatic erosion of national income and brought the country's real per capita GDP to its knees, as it plummeted by almost one-third, an experience some analysts assert has never occurred anywhere else in Africa during peacetimes. The past decade also witnessed a significant surge in commodity prices on the international market, including copper since 2004. Although the structure of the economy has changed slightly, the country still has a strong dependence on mining (IMF, 2015).

We argue that understanding the extent to which the country's fiscal position is linked to natural resource dependence, we need to examine fiscal responses during resource 'boom-bust' cycles and government management of resource revenues. Our econometric findings in this chapter suggest that during resource booms, governments in developing countries tend to come

under huge political pressure to engage in extravagant public expenditure; and because of state weakness, these spending extravagances tend to be difficult to completely reverse during resource busts, thereby causing fiscal deficits to emerge. Also, as we discovered in chapter 2, natural-resource intensive economies such as Zambia have not just failed to successfully introduce new taxes which can recoup a fairer share of revenues from the resource sector, because mining companies are so powerful to compel government not to force heavier taxes for them to pay, but have also tended to be slack in their imposition of the corporate taxation that is due, making it difficult to restrain the public sector deficit and, of course, setting a bad example to other taxpayers by transparently failing to encourage timely payment of taxes.

We argue that Zambia's experience fits a pattern where resource 'boom-bust' cycles fuelled unproductive public spending resulting in massive budgetary imbalances and high public debt. We attempt to trace these trends to the periods of copper booms of the early 1960s and early 1970s, and busts of 1980s, and the most recent 'boom-bust' and resource management of the 2000s. Particular attention is also given to government fiscal responses and resource management during these periods. As a mineral intensive country and following the nationalisation of the mines after independence, natural resource revenues have been a major source of revenues for the government of Zambia. The country boasted of a strong fiscal position during the decade after independence (1964-1974) with many of the government programmes funded from government revenues, bolstered by mineral revenues (Kalinda and Floro, 1992). Although copper revenues presented an opportunity to investments in economic development, development policy as espoused in successive National Development Plans was anchored on an expensive and inefficient strategy of nationalisation of key economic sectors and a strong preference for heavy government participation in the economy. Throughout the 1970s, resources were wasted on promoting 'import substitution' and protection of 'infant industries' as the panacea for achieving industrialisation. Additional resource revenues were directed at public consumption mainly subsidies in the agricultural sector mainly covering the production of the staple food, maize but also towards other consumer items such as 'cooking oil, salt, matchers and soap' (Kalinda and Floro, 1992: p. 7) and sustaining inefficient state-owned companies, on the expectation that the fairly favourable copper prices on the international market will remain for some while (Adam *et al.*, 2014). Substantial amounts were also allocated towards social sector spending, education, health and social service

delivery: in particular there was a massive expansion of social infrastructure in form of public schools and hospitals (Ibid). Because of the booming copper sector which brought into national coffers additional revenues there was at that time no real concern over the country's public finances, or pressure to keep them under control. The natural resource booms were able to pay for most public expenditure. In the final analysis, Zambia was able to expand its total final expenditure on consumption and investment by some 70 percent of GNI in the years immediately following independence. However, with weak bureaucratic capacity, there was neither proper planning with respect to the sustainability of these policies other than its reliance on booming copper revenues, nor the capacity to effectively administer these measures (Colclough, 1989; Kalinda and Floro, 1992). The expansionary period bequeathed to later years a high level of running costs and the burden of servicing debt.

When world copper prices collapsed during the 1980s, the country plunged into a profound and lasting macroeconomic crisis as public spending, driven by policies of urban bias, became unsustainable. Copper prices plummeted by about 51 percent creating a gaping hole in export earnings of almost 43 percent. Two factors were at the centre of the fiscal response to this macroeconomic crisis: firstly, the pressures from domestic political constituents to continue with the urban bias agenda in order not to alienate the interest groups on whom political stability depended and secondly, the shock was wrongly treated as a temporary phenomenon and was not expected to take long. According to a former of minister of finance "copper prices had once collapsed in 1970 only to rebound in 1974, and when we consulted the World Bank the advice was that the shock was temporary with prices expected to recover within five years". Under pressure from the political influence of urban dwellers and faced with what was perceived as a temporary fiscal deficit, the government's initial policy response was to borrow to cover the deficit. However, as copper prices continued to fall, mineral revenues which had financed most of public expenditure, including the extravagant social services aimed at maintaining consumption and living standards in urban areas, had dried up by 1977. At this point it was clear that the temporary deficit had become persistent and was now a major concern. "[T]here was a real concern and a sense of desperation in the UNIP government over public finances from the early 1980s – national coffers had dried up" as one of our interviewee, a former deputy minister in the UNIP government responded to our question on how the political leadership took the crisis. The rapid expansion of

social service spending during the time when copper prices were fairly favourable, could no longer by supported by the dwindling copper revenues. Government revenues declined with the fall in copper export earnings from the average of about 30 percent of GDP during the first decade of independence (1965-75) to less than 20 percent from the mid-1980s onwards. The World Bank estimates the deficit to have averaged around 13 percent of GDP during the period 1975-85 (World Bank, 1987). Attempts were made to close the fiscal gap by cutting spending, but these efforts were not sufficient to eliminate deficits or address the fiscal crisis.

We argue that even when it was certainly evident that the government needed to cut spending further, as deficits persisted, the government sought additional borrowing with significant fiscal risks over spending cuts because it was too scared to cut 'politically sensitive' areas like public sector employment, food subsidies and social service provision. The case of state weakness was clearly illustrated by the events of December 1986, when at a time of severe economic crisis with fiscal deficits averaging about 13 percent of GDP, following an IMF recommendation, the Kaunda government announced measures to restrict government spending including reduction of subsidies on food and fertilizer, and a wage freeze so as to curb the deficit that had clearly become difficult to control. The removal of subsidies, which caused massive increases in prices of basic foodstuffs including the staple food (corn meal) but was crucial to bringing deficits down, had to be abandoned after four days of a violent revolt by the urban population in which eleven people died. Fearing the danger of alienating powerful interest groups – the urban population, labour unions and civil servants – on whom political stability and continued stay in office depended, President Kaunda announced on 12th December 1986 the cancellation of price rises and reinstated the subsidies, thus allowing the deficits to persist. Subsequent economic development and democratisation have not reduced Zambia's natural resource dependence: mineral exports as a proportion of total exports remain high at about 70 percent which is lower than 89 percent about the level in the 1970s and 1980s (World Bank, 2018). What is surprising in Zambia is that attempts through liberalisation and privatisation as in the 1990s or through an extension of capitalism since 2010, have alike been unsuccessful in reducing mineral dependence and its various harmful impacts, some of which have been illustrated – such as rigidity of tax revenue in Chapter 2, limited bureaucratic quality in Chapter 3 and increasing lack of control over budget deficits as illustrated in Figure 4.3 above.

During the boom of 2010, government accelerated spending by embarking on large-scale infrastructure projects and expansionary fiscal policies. As well as constructing new and rehabilitating old road networks, building of new hospitals and housing units, and expanding airport infrastructure to cater for an estimated ten-fold increase in traffic, the government more than doubled the size of the public sector wage bill in 2013 and introduced a new (higher) minimum threshold of taxable personal income. The government also increased administrative expenditure, expanding the number of provinces by one (to 10), and the number of districts from 72 in 2011 to 115 by 2017. When the copper boom began to recede after 2011, declining from US$6,800 to US$4,900 per tonne between 2011 and 2014, government revenues especially the mineral royalty and corporate income tax were hit, and this combined with the increases in public expenditure referred to above caused the public sector deficit to increase sharply as can be observed in Figure 4.3. Left with this gap combined with a slowing economy, the government turned to borrowing to maintain spending and stimulate the economy. Although Zambia had a slightly above average level of public sector budget deficit in the past, it has been deteriorating faster than anywhere else on the continent since 2010, worsening by 7.2 percentage points between 2010 and 2017 (see Table 4.2 above). Public debt has increased rapidly, from 21 percent of GDP in 2011 to about 60 percent by 2016 (MoF, 2018; 2017), and now a larger proportion of the budget is being spent on servicing past debt, thereby diverting resources from social spending. For example, debt service was less than 15 percent of the budget prior to 2009, but now at 31 percent it is more than spending on education (at 9 percent), and over half of combined spending on health and education. The fall in commodity prices exacerbated the difficulty of controlling public sector deficits because it weakened the local currency and consequently made foreign currency-denominated public debt more expensive. The estimated impact of the depreciation of the local currency on debt service was estimated at K1.3 billion (US$118 million). Other problems that have cropped up are delays in making payments to government contractors (suppliers of goods and services) resulting in a build of public debt and delays in paying civil servants' salaries (for example, salaries for January and February 2019 were delayed by a month).

The second issue documented by our econometric analysis, is that natural resource dependence can affect fiscal performance via its negative impact on institutions, in particular rent-seeking behaviour and corruption. Some scholars have argued that this is probably the biggest

challenge facing natural resource-intensive countries (Tornell and Lane, 1999; Arezki and Brükner, 2012). We wish to examine the extent to which the idea that because natural resources generate significant rents, powerful interest groups compete for fiscal windfalls thereby exacerbating the difficulty of building fiscal discipline, fits the Zambian experience. Zambia has certainly experienced some of the political consequences of natural resource dependence as predicted by theory, mainly through weak institutions and rent seeking and corruption. As in many natural resource rich countries in Africa, there is a considerable history linking rent-seeking and corruption to poor policies and management of natural resources, in this case copper, in Zambia. The privatisation of the mines in Zambia provides some of the patterns that have been linked to these problems. The privatisation of the mines which started in 2000 and ended in 2007, saw a total of eleven private mining companies buying off assets previously owned by the parastatal Zambia Consolidated Copper Mines (ZCCM) Limited while others developed green field assets. Under the agenda of encouraging private sector investment in the country's largest industry, the government discreetly granted what appears to be extremely generous tax concessions, informally exempting all mines except for the more profitable deep mines in the northwest (Lumwana and Kansanshi) from payment of corporate income tax. This tendency towards overlooking the tax obligations of established clients of the government extended beyond the mining industry to other parastatals such as the Zambia Sugar Corporation (Action Aid, 2013: Sweet nothings 'The human cost of a British sugar giant avoiding taxes in southern Africa') Action Aid, a charity organisation working in developing countries, found that the Zambian subsidiary of Associated British Foods had during the early 2000s been using an array of tax planning schemes to avoid paying US$13.8 million in due taxes on its Zambian activities, and this constituted one of major constraints on the ability of the Zambia Revenue Authority to sustain the tax ratio and control the public sector deficit. In particular, of course, it was very hard to persuade small- and medium-income corporate taxpayers to pay their income tax obligations when much larger-scale operators were so obviously being exempted. Indeed, as shown in chapter 2, the tax ratio in Zambia actually fell over time during the period 2001-2018, and played a major part in the tendency for the budget deficit to deteriorate as reported in Figure 4.3 above.

It is the awarding of these 'under the table' tax concessions which has been linked to bribery and corruption (Curtis and Lissen, 2008), and thence to the persistence of budgetary deficits on a

larger scale in Zambia than in otherwise similar developing countries (such as Ghana as discussed in Chapter 2 above). A related area to this which has come under intense scrutiny is the management of tax exemptions. Fiscal powers to grant tax exemptions are vested in the Minister of Finance, and reports and our experience in the Ministry of Finance, show that decisions are often related to individual mining companies and people, rather than being based on any strategic sector-wide argument. This is well illustrated by how the granting of tax concessions was done during the privatisation of the mines. In 2000, the minister first granted tax exemptions to two mining companies, Konkola Copper Mines and Mopani Copper Mines. This policy decision infuriated other mining companies which petitioned the government so that they could also benefit. What followed was a highly guided confidential process of negotiations with individual mining companies with virtually no input from key stakeholders except politicians from the ruling party, with no public explanation of the foundational basis of the expansive tax concessions. These series of negotiations culminated into the signing of eleven individual Development Agreements with what many commentators, including the international development community regard as some of the most generous tax exemptions observed in Africa. Specifically, the mineral royalty rate was reduced from 2 percent to 0.6 percent; the corporate income tax rate was reduced from 35 percent to 25 percent; the period for carrying business losses forward was increased from 5 to 20 years; the withholding tax rate was reduced from 15 to 0 percent; excise duty on electricity was abolished for a period of 5 years; and tariffs on consumables scrapped.

Several people interviewed by ourselves believe that the negotiations that led to Development Agreements provided fertile grounds for corruption, and also placed the government in a persistently weak bargaining position in relation to the mining companies. This view was also strong even as early as 2008, when it became publicly apparent that the unprecedented increase in copper prices had not translated into more revenue benefits for the country because of the tax concessions and the long stability periods offered to the companies through the Development Agreements. Under public pressure and with the help of the Norwegian government, the Mwanawasa regime government abolished the Development Agreements and introduced a new fiscal and regulatory regime in 2008, which included among others, a copper windfall. However, fearing to alienate the mines which had threatened to suspend operations and take legal action against the Government, the new government of Rupiah Banda which took office after

Mwanawasa's death abandoned the windfall tax in 2009. Political interference and rent seeking have continued: in 2014 when the government doubled the mineral royalty tax rate on mining to raise revenues to close budgetary gaps that had gone out of control, mining companies threatened to scale back substantially their operations and layoff more than 20,000 workers. Fearing the political fallout that would result from estranging the mining companies, the President directed the ministers of Finance and Mines to renegotiate the new tax arrangements, which were subsequently substantially reduced leaving the country still grappling with large budgetary gaps and rapidly increasing public debts. These episodes appear to confirm our finding that natural resource dependence can negatively affect fiscal performance through political interference, rent-seeking and corruption alongside other tax-related issues discussed in more detail in Chapter 2 above, as one of the major causes of poor revenue performance and thence the fiscal deficit. Unhappily, this problem has persisted into the current decade, as shown by Table 4.10, but has also been accompanied by worsening control of public expenditure.

Table 4.10: Tax regimes for the mining sector in Zambia (1964 – 2017)

	Kenneth Kaunda				**Fredrick Chiluba**	**Levy Mwanawasa**		**Rupiah Banda**	**Michael Sata**	**Edgar Lungu**	
	1964-1966	**1970**	**1983**	**1986**	**2000**	**2007**	**2008**	**2009**	**2012/14**	**2015**	**2016**
Mineral royalty	13.5%[a]				0.6%[b]	3% of gross sales value	3% of norm value	3% of norm value	6%	6-9%	4-6%
Corporate income tax	37.5-45%	45%	45%	45%	25%	30%	30%	30%	30%	30%	30%
Mineral tax		51%	51%	51%							
Export tax			4-8%	13%							
Windfall tax							25-75%	Abolished			
Variable income tax							15% when taxable income is above 8% of gross value	15%	15%		15%
Withholding tax				15%	0%	15%	15%	15%	15%	15%	15%
Capital allowances	5%	100%	100%	100%	100%	100%	25%	100%	25%	25%	25%
Reference price	Yes	No	No	No	No	No	Yes (LME)	Yes	Yes	Yes	Yes
Ring fencing	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Carry forward of losses	Yes	Yes	Yes	5 years	10-20 years	10-20 years	10-20 years	10 years	10 years	10 years	10 years

State ownership	No	51%	100%	100%	10-20%	10-20%	10-20%	10-20%	10-20%	10-20%	10-20%
Fiscal stability	No	Yes	No	No	Yes	No	No	No	No	No	No
Exemptions from tariffs	No	No			Yes	Yee	Yes	Yes	Yes	Yes	Yes
Development agreements					6	11	0	0	0	0	0
Tax haven owner	Yes	Yea	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[a]This rate was applied on gross output multiplied by the prevailing London Metal Exchange price at the time of production, less the estimated cost of production of K16 per ton
[b]of gross sales value less transport, insurance and refining costs
[c]the monthly average cash price per metric ton

4.6.3 Effectiveness of IMF (and other) conditionality

When a country is hit by a severe macroeconomic crisis and fiscal imbalances, international mechanisms are available to help steer the economy out of such crises, in particular IMF standby agreements, typically made conditional on policy and structural reforms such as public expenditure cuts and liberalisation of the exchange rate. Faced with increasingly unmanageable levels of public debt as described above, the Zambian government approached the IMF in 2013 for such a standby. The Fund agreed to help - but attached conditionality in the form of a strong and sustained fiscal consolidation path starting in 2015 to significantly lower the deficits, including specific measures to increase domestic revenues and scaling back public spending (IMF, 2015). However, the commitment to engage with the Fund began to fade following the death of the country's president, Michael Sata, in October 2014 as the new administration did not seem eager to conclude the negotiations. One respondent who worked in the Ministry of Finance at that time, indicated that although the ministry of finance was enthusiastic about an IMF bailout, the incumbent political leadership was 'uncomfortable' accepting and implementing the aid package in the form proposed by the IMF, namely withdrawal of fuel and electricity subsidies and scaling down significantly the infrastructure budget (roads, housing units, hospitals, airports, etc). It has been reported that when the team from the IMF Headquarters met the President in 2015 in Zambia for a possible bailout package, the proposed aid package was turned down because it was feared that it would have significantly constrained critical spending (required to boost re-election chances) during the heavily contested 2016 presidential election. He is reported to have told the IMF that withdrawing subsidies would stoke up "price increases" while slowing down infrastructure projects would be a

"sign of failure", both of which could cost him the next election (Quoting Lusaka Times, 21 November 2015). A deadlock was 'informally' declared as the IMF could not accept the borrowing plans proposed by the government in exchange for financial help. Therefore, the IMF returned to Washington without an agreement.

Further efforts by the IMF to reach an agreement on an economic programme for Zambia failed even after its Deputy Director in charge of African Affairs met the government in January 2016, on account of lack of specific measures and reforms to achieve fiscal consolidation, and more fundamentally existing policies threatened macroeconomic stability and debt sustainability (IMF, 2017). In November 2016, the IMF warned that Zambia had now crossed over from the category of 'moderate risk' into the territory of 'high risk' of debt distress (IMF, 2016) after an attempt by the ministry of finance to engage the IMF into negotiations failed. With the fiscal situation deteriorating faster than anywhere on the continent in the recent past (see Table 4.2), and the cost of adjustment escalating exponentially, the Zambian Cabinet in February 2018 approved several measures envisioned to start curing the now out-of-control public sector budget deficit and convince the IMF, but again these were rejected on similar grounds. Discussions on a possible Enhanced Credit Facility (ECF) IMF arrangement had remained on hold in 2019.

One of the big puzzles in the period 2011-18 is how the Zambian government had somehow avoided reaching an agreement on an aid package with the IMF, but managed to finance its deficits despite its public finances being under severe stress. We argue that this puzzle may be explained by the declining restraining influence of traditional aid donors due to the increased ability of poor LDCs, particularly in Africa, to turn to alternative sources of sovereign finance, namely China and Eurobond markets. In Zambia since 2011 the government has increasingly turned to China and commercial lenders for loans to fund its deficits given the welcome absence of a requirement to implement IMF-type austerity measures, which the incumbent political leaders are certainly not comfortable to implement (*The Economist:* 15 September 2018; *Africa Confidential*: 25 January 2019). Between 2015 and 2018, the IMF repeatedly tried to dissuade the Zambian government from expanding its borrowing from China, but to no avail. Our respondent in the ministry of finance, who was involved in some of the negotiations stated that the government has been sceptical about the adequacy and predictability of the IMF bailout package, as well as the potential

negative impact of the austerity measures. The government seems resolved not to accept any conditionality which, like the IMF's, would have halted borrowing and thereby reduced the public sector budget deficit. When the most recent negotiations failed in August 2018, the government formalised the deadlock by declaring it was going ahead with its earlier plans of sourcing financing from other sources – predominantly from Chinese sources. In a media brief on 17 February 2018 on the conclusion of the failed discussions, a presidential spokesperson stated that "there is no worry in government whatsoever about the status of the IMF program because the stalling IMF arrangement has no effect on Zambia's growth strategy… we will not go to the end of the earth to pursue an IMF programme. If it comes, well and good, if it doesn't.., we are proceeding with the credible programme which is already delivering results" (quoting: Lusaka Times Reuters, 20 April 2018). This was an apparent reference to the borrowing plans approved by the Zambian Cabinet and rejected by the IMF, because no other plans had been developed. The government also put pressure on the IMF to recall its envoy, a year prior to the expiry of his tenure in Zambia, for his open criticism of the rising foreign debt, which remarkably the IMF openly endorsed (The Mast: 28 August 2018; Africa Confidential: 14 September 2018; The Economist: 25 September 2018). Although the ministry of finance had confirmed his premature departure and that the IMF had committed to send his replacement (MoF Press Statement: 24 August 2018), no new envoy had been sent after 8 months.

The declining influence of advice from the DAC donors can also be seen in the withdrawal of bilateral aid to Zambia government by the Norwegian government, which had been supporting the country to improve the effectiveness of tax collection, particularly in the mining sector. The Norwegian government, with the backing of the IMF, had supported Zambia in improving the taxation of the mining sector in a number of areas since 2006, focusing on knowledge sharing, provision of technical expertise and legal advice on possible routes out of the infamous development agreements, support towards specialised auditing of mining companies, development of a mining tax model and training of staff in the country's revenue collection statutory body, Zambia Revenue Authority (Fjeldstad and Heggstad, 2011). Support was also provided towards the country's Mineral Value Chain Project, aimed at developing and strengthening information coordination systems. Although there had been some success, particularly in the area of audit capacity, the Norwegians were unhappy with the 'political forces' in the ministry of finance that

ignored more prudent advice from international partners on the importance of providing a predictable and equitable tax regime for mining companies. Against donor advice, the government had embarked on an unpredictable and reactionary approach to tax policy, amending the fiscal regime for the mining sector about 9 times between 2000 and 2014, a situation which contributed not only to a hostile relationship between government and mining companies, but also adversely affected the tax ratio (lower revenues from the mines). For example, the IMF (2015: p. 10) argues that an unexpected change in the mining fiscal regime and documentation requirements for purposes of value added tax in 2015 "impacted the outlook for the mining sector." Norway pulled out its support to the Zambian government in 2014, primary for these and other governance-related reasons. Other aid donors like DFID, who had been providing aid to government to help increase tax revenues so as to reduce the country's reliance on the UK and other donors, suspended its support due to reports of corruption in the handling of social cash transfer.

Although the country has in this way managed to dodge the imposition of conditionality, it has not completely escaped the cost of delayed adjustment: fiscal deficits have been deteriorating faster than anywhere else on the continent since 2010, concerns on public debt have increased as it has increased rapidly, from 21 percent of GDP in 2011 to about 60 percent by 2016. According to the most recent debt sustainability analyses conducted by the IMF in low income countries, Zambia is now one of the 17 countries in Africa considered to be at highest risk of debt distress.

4.7 Conclusions

In this chapter, we sought to understand why fiscal deficits have become difficult to manage and control, especially in Africa. Large and persistent fiscal deficits profoundly concern policymakers and development agencies because of the economic costs such as macroeconomic instability, unsustainable public debt, loss of flexibility to conduct effective countercyclical fiscal policy and loss of investor confidence in the economy which has implications a country's competitiveness. A large literature has identified several economic, political and institutional factors identified as determinants of fiscal deficits.

Our study focuses opportunistic '*political business cycles'* to understand whether governments in Africa have been able to implement the deflationary phase of the cycle to bring down fiscal deficits after the election as claimed by the political economy literature. We also considered the short- and medium-term effects of natural resource endowments on the ability to manage and control fiscal deficits, focussing on the 'boom-bust' cycles, management of natural resource revenues, and the effects of natural resources on institutions. Finally, we analysed the effectiveness of external and internal institutions, through their restraining influence through various instruments, in promoting fiscal discipline and heling African countries in managing fiscal balances.

We use a 'qual-quant' approach. In our quantitative analytical framework, we follow the literature to specify a standard dynamic model that captures the essence of the Nordhaus-type opportunistic behaviour to which we add all our key variables in this study. These models are then estimated on a sample of 42 African countries for the period 1980-2017, using robust OLS and *fixed effects*. An instrumental variable estimator three-stage least squares (3SLS) is also utilised to estimate a system of equations to address a potential problem of endogeneity of some of our explanatory variables.

We find some evidence that in most African countries the pre-election fiscal boost is not counterbalanced by a post-election cutback (as shown by a statistically significant negative coefficient on the election-year dummy and an insignificant positive coefficient on the post-election year dummy). There is consistently strong evidence of a negative medium-term effect of natural resource endowments, but both domestic and external institutions restraint emerge with a very weak restraining influence. In the qualitative part of the analysis, we also discover three additional factors which appear to play a part in that dynamic. First, Zambia's increasing democratisation has expressed itself in increasingly weak government resistance towards demands for higher public expenditure around elections, especially after the mid-2000s. Second, the country's natural resource intensity has weakened government ability to manage and control deficits, mainly through weak tax effort especially an extraordinarily generous (and secretive) treatment of the tax liabilities of most of the mineral corporations and wasteful and unproductive use of natural resource revenues. Finally, the advent of the Chinese as aid donors, which has

relieved Zambia, as it has relieved many African administrations, of the need to go to the IMF when faced by debt escalation which would otherwise not have been controllable.

Chapter 5
Conclusions

This thesis focusses on some of the most urgent and consequential issues in fiscal policy and development in Africa. Although it concerns Africa in general, we also make special reference to Zambia because fiscal policy has become a major economic topic in the country, and the sponsors of my PhD had expressed interest in its findings. Recent trends have shown that, as in many other African countries, tax revenues have stagnated or declined, economic growth rates have slowed down, public debt have significantly increased, and fiscal deficits are getting out of control. One of the consequential implications of these developments for Zambia is that the country was reclassified by the IMF in 2016 as being at the highest risk of debt distress, and in 2019 international rating agencies downgraded its credit rating from Caa1 to Caa2 on account of the huge public debt and fiscal deficits. Therefore, thesis has been designed as three core chapters, specifically focussing on the developmental role of taxation, public expenditure and fiscal deficits. Across the three core chapters, we employ a 'qual-quant' (quantitative – qualitative) empirical, a key contribution of our work, using panel data regression analysis as main analytical framework and a case study approach in the final section pf each chapter to identify causal factors which don't typically emerge regression analysis.

In chapter 2, the main research objective is about how to get developing countries out of the low tax-low public expenditure-low development spiral. This is on one of the most urgent and intractable problems in development because the capacity to generate sufficient tax revenues is at the core of building effective states and, therefore, development (Bräutigam *et al.*,2008; Besley and Persson, 2013). First, we explored the effectiveness of reforms implemented to remedy the *poor quality of tax structure*s which are recognised to play a major role in the growth of tax revenues in developing countries. Reforms to improve tax structures have involved replacing taxes which depend on low-yielding, unstable and narrow bases, with the VAT, which has spread to most developing and emergent countries. Second, the tax literature has identified *political factors* as the root of poor tax revenue performance, as governments especially of weak states are frightened to raise taxes for fear of loss of office. Efforts to mitigate against political risks

associated with tax increases, have included ring-fencing the process of revenue collection and transferring it from the direct control of the ministry of finance and other political authorities to ARAs. Third, the theoretical literature has also proposed framing the process of revenue collection as part of a 'fiscal contract' in which the government encourages taxpayers to pay their taxes in return for better public services, as part of mitigating against political risks associated with tax increases. Existing evidence on the effectiveness of the effectiveness of the VAT and ARA is surprisingly limited, and inconclusive, as can be observed in Table 2.2, with the most recent and comprehensive studies being sceptical about the revenue effects (Ahlerup *et al.*, 2015; Dom, 2019). We do not have systematic evidence concerning processes by which 'fiscal contracts' can be formed and what impact they have had on revenue generation.

A standard tax equation is specified and estimated by *OLS*, *fixed effects* and *random effects* on a sample of 42 African countries covering the period 1980-2013, to test these ideas. Possible endogeneity problems such as selection bias and omitted variable and time lag effects are also accounted for in our empirical approach. Taken together, our quantitative results show that VAT has had no effect, neither in the short- nor in the long-run. The ARA may at best lead to higher tax revenues in the immediate term, but the effect dissipates over the medium to long term. ARAs have also been found to have a positive effect in countries with better institutions of governance. Our results also show a consistently strong positive impact of the two factors that are crucial in the emergence of a stable 'fiscal contract' – democratic accountability and the quality of public expenditure – on tax ratios.

The qualitative section the case studies of Ghana and Zambia provide some insights into the factors underlying the development of tax capacities in Africa. Our analysis revealed that the ability of the Ghanaian government to secure support of taxpayers and the public by offering a bona-fide through ear-marking the additional revenues from the three increases in the VAT rate towards the Ghana Education Trust Fund and the National Health Insurance Scheme played an important role in building effective 'fiscal contracts' and increasing the VAT revenues. By contrast, in Zambia VAT revenues had remained stubbornly lower than when the tax was first introduced, partly because of the increasing weak resistance towards demands from the urban populations for the reduction of taxes to lower prices of basic commodities, which resulted in the

reduction of the rates from 20 percent when the tax was first introduced in 1995 to 17.5 percent in 2003 and 16 percent in 2008. Our case studies have also revealed that the VAT may actually be more complex and difficult to administer in low-income countries, due to its heavy reliance on robust information and systems requirements especially for large and complex business transactions, which have created enforcement problems and undermined its effectiveness (Jantscher, 1987: p.3). In Zambia, the key problem with the VAT appeared to emanate from the steady increase in input tax refunds relative to the growth in tax collections, which as shown in Figure 2.8 had doubled between 2013 and 2015 while the VAT revenues had remained static.

We also discover that another factors which appear to play a part in the difference between the two countries is an extraordinarily generous (and secretive) treatment of the tax liabilities of most of the mineral corporations and the increasing lack of resistance to demands by the powerful mining companies to be exempt from higher taxation in Zambia, where only two out of eleven mining companies pay corporation tax, an issue that had become widely known and debated, unlike Ghana where all except two larger mining companies pay rates. The two case studies also enabled us to observe other processes by which effective 'fiscal contracts' were built: in particular the offer by government of a bona-fide, or incentive to take part in a contract – either a tax cut designed to buy bigger tax increases in future (as in Ghana in 1992), or evidence of effective public expenditure, or a formal or informal link between a particular tax base and a particular form of favoured public expenditure (as in the windfall taxes levied in the 1990s and 2000s in both countries). Finally, our analysis illustrated that if there is widely disseminated evidence that big players (in particular multi-national corporations) are not paying what they owe, that will act as a disincentive to all the other players seeing their tax liability as contractual. Other issues, however, remain unresolved, in particular the ability of ARAs to reduce corruption and increase tax revenues.

Although there is now abundant evidence of several low-income countries (not only Ghana as illustrated by our case-study, but also Uganda, Tanzania, Rwanda; see Figure 2.6 above) have been able to break out of the low tax capacity, and that the formation of a fiscal contract, often with the assistance of the IMF and aid donors, it remains the case that low-income countries still, on average, have worse tax performance than lower-middle and middle- income countries, and this

holds their entire development back. The particular aspect of this that we would like to raise in conclusion is that the formation of 'fiscal contracts' is not a one-shot action, but a process, often long-drawn out in time and often requiring experimentation and policy reversal (the case of Ghana's botched and excessive initial VAT introduction in 1995 at 17.5 percent is relevant here). Moreover, it is a process requiring the slow building of trust, and this requires in turn the making of down payments or bona-fides which require risk-taking and financial sacrifices exceeding the capacity of the poorest developing- country administrations, -especially if they are also fragile, conflict-vulnerable states. To take a specific example, the crucial move made by Ghana in 1992, of liberalising its cocoa industry, was important in presenting the Ghana government as a credible partner in a 'fiscal contract' and politically enabling the raising of taxes elsewhere in the economy; but it was a move with considerable short-term financial costs (note the dip in Ghanaian public revenue after 1992 on Figure 2.7a) and this implies costs, and political risks, not necessarily affordable by a state with a weaker bureaucracy and less access to aid donors: for example, a Burundi, a Southern Sudan, a Central African Republic or a DRC[46]. The question what kind of 'down payments' towards a fiscal contract can feasibly be made by governments in this predicament represents, in our opinion, an important frontier for future research.

In chapter 3, the objective is to understand whether investment in human capital, including public expenditure on education, is effective towards promoting long-run economic growth, since it has been given a pride of place in the theoretical literature by the 2018 *Nobel Prize* winner Paul Romer and other 'endogenous growth theory' advocates. The focus on education rather than on all human capital is because it is education which has been credited in the literature to generate technological change and thence growth. We examine the possibility that although aggregate measures of education spending may not emerge as significant correlates with growth, some of the categories of education spending may differentially affect growth as suggested by the World Bank and others. We also draw attention to an issue which has recently attracted international attention and debate – and has led to an apparent shift in World Bank policy on human capital from more enrolments to more learning – that the quality of education human capital, which has been

[46] The question of how to best target expenditure (and, by our argument, increase tax yield) in 'fragile states' is addressed by the recent OECD report on those states (OECD 2014). This draws particular attention (OECD 2014: p.45, Box 5.1) to the 'One Cow per Poor Family' programme in Rwanda, which being targeted, asset-based and decentralised, satisfies several of the conditions for a positive bona-fide towards the making of a 'fiscal contract'.

underexplored in the literature, is crucial for development. Our indicator of human capital quality (repeat rates) – being used as second best option due to data limitations on other more ideal measures such as test results.

A simple 'endogenous growth' framework is estimated on a sample of 42 African countries between 1980-2016, using the *OLS*, *FGLS* (a variant of the GLS estimator) and the instrumental variable *2SLS*, guided by the need to make our results comparable to previous studies. Our quantitative results show no evidence that increasing government spending on education and expanding school enrolments are associated with economic growth. The analysis of disaggregated data on education spending levels fail to support the World Bank's conventional wisdom that allocating more resources towards primary is associated with higher growth. However, there is strong evidence that improving the quality of education provides a clear boost to economic development, much more than by school enrolments. Our preliminary findings show similar results as observed by van der Berg (2007) for South Africa and the *2018 World Development Report* in several poor countries, that the quality of educational human capital, which has been underexplored in a majority of growth studies, matters more than the quantity and that policies which have strongly focussed on expansion of school enrolments may have compromised quality, confirming the scepticism about education quantity expressed by the World Bank's 2018 World Development Report. Focus on universal primary education is important, but not sufficient and must be complemented with the goal of improving quality. Appropriate policy to raise the quality of education should focus on improving schooling conditions and the quality of institutions as these can propel the growth effects of the quality of education. One possibility for the weak impact of education expenditure, which we considered here was variations in the quality of institutions of governance. Although the quality of institutions has been associated with better outcomes, we found no evidence that it provided a boost to the development impact of educational spending in Africa. Estimates of the growth effects of educational human capital quantity, measured by gross enrolment rates at primary, secondary and tertiary levels, emerged with no statistical significance.

Government expenditure on education, as a share of the national budget, rose from around 7.7 percent in the late 1990s and over the next two decades reached more than 20 percent. By 2015, education expenditure had become the single largest share of the budget. Total enrolment rates

expanded from less than 70 percent at primary during the 1970s, to almost all school-age children primary being accommodated at more than 102 percent enrolments. Secondary enrolments also expanded from around 14 percent in the 1980s to about 40 percent after 2010. However, as can be observed from Figure 3.3, the country's economic growth was relatively poor, with an estimated average growth rate of -1.6 percent per year, during the first three decades of independence when there was massive growth in spending and expansion of schooling. The GDP growth rate temporarily improved between 2001 and 2010 recording the country's highest performance of above 7 percent in 2010 since the 1970s, but in recent years the trend has been declining reaching -0.1 percent in the year when education spending and enrolments were at their highest – 2015. This apparent lack of linkage between education spending, schooling and economic growth was in line with the findings from our regression results, where the insignificant coefficients on these explanatory variables suggests no association.

In the qualitative section of the analysis, we apply the same analytic framework to investigate why massive investments in education in Zambia since independence have not been correlated with improvements in economic performance. The evidence shows that explanations for low educational impact and quality can be linked to inefficiencies in managing public resources, including disproportionate allocation of scarce resources to wages/salaries versus other educational inputs leading to widespread lack of the necessary teaching and learning materials and the failure to send resources designated for specific areas to those areas. Educational quality has been compromised by a failure to recognise that growth in enrolment cannot effectively deliver better learning unless complementary inputs such as teaching materials, additional teaching staff and maintenance of school buildings are delivered at the same time: a problem which in Zambia has been compounded by weak budgetary discipline and switching of such resources away from the areas to which they had been destined.

First, in Zambia, like many other developing countries, education expenditure is predominantly allocated and spent on teacher salaries. The World Bank (2018) has documented that teachers' salaries constituted the largest single budget item in education expenditure in low-income countries, accounting for more than three-quarters of the budget. The evidence based on data from the ministry of finance showed that in Zambia, this budget item (salaries) averaged about

89 percent of total educational spending in Zambia between 2009 and 2015, leaving 7.5 percent for construction and upgrading of schools and 3.5 percent for other educational inputs. We have argued that spending more on teacher salaries is not necessarily in and of itself a major problem, but it had made it difficult for the provision of other learning and teaching complementary inputs needed such as textbooks and in-service training which are crucial in significantly aiding learning. We argue that such factors could explain the weak association between education spending and learning.

Second, despite the presence of policies to ensure the quality of learning, such as school grants for primary and secondary education, weak implementation undermines the effectiveness of these programmes. This situation is exacerbated by the problem of schools not often unaware of how much they are supposed to receive. For instance, primary schools are supposed to receive school grants (funding) from government to support the free education policy, but 30 percent of schools do not receive any government grants. In 2013-14, almost a third of school capitation grants failed to reach Zambian primary schools, thus public funds sometimes fail to reach schools or are not used as intended. In Zambia funds were diverted for other uses, including to fund district level operational costs.

Third, substantial improvements in educational spending and enrolment rates had on our analysis, not improved the quality of education as measured by learning outcomes: the significant coefficient on the variable *Repeat* in Tables 2.9 and 2.10 suggests that the problem is one of declining educational quality. This problem is paralleled elsewhere: for instance, across Africa as a whole there had been no improvement in student learning at grade 5 between 1999 and 2014, as national learning assessment scores averaged 34.5 percent in maths and 33.2 percent English in 1999, compared to 35.3 percent and 31.4 percent respectively in 2014 (World Bank, 2018: p.59). Although the government has invested in improving schooling conditions by recruiting more teachers and thus, making some improvements in the pupil-teacher ratio (PTR) to around 40 (the mid-range for region), this has not fully translated into improvements in the quality of education in Zambia because of other factors such the high levels of teacher absenteeism, there has been no improvements in the provision of textbooks and shortages are widespread (World Bank, 2018: p.59). The World Bank reports that the number of primary school students sharing a text book

textbook for each subject is around 5 (1 for mathematics, 0.9 for English, and 0.9 for science) and almost the same number of secondary school students share between 1 and 1.5 textbooks (for example, 1 for math, 1.7 for English, and 1 for science). At the primary level, there seems to be no urban and rural difference in the availability of textbooks; however, rural secondary schools face more problems with textbook shortage compared to urban secondary schools (World Bank, 2018; Figure 3.18). In secondary, shortages in science and math textbooks are more serious than those in English textbooks. Eighty-two percent of primary schools and 63 percent of secondary schools reported the shortage (Ibid: p. 61). School enrolment rates have rapidly improved since the 1970s, reaching 75 percent for primary, 96 percent for lower secondary, 59 percent for upper secondary. However, learning achievements have been low – below the 40 percent mark in all subjects (English, math, local language). Scores for English and mathematics for grade 5 remain as low as 32 percent and 35 percent, respectively (Examination Council of Zambia 2015). Scores in grade 9, too, show low scores of 29 percent for mathematics and 36 percent for English and science, respectively. Finally, the Zambia case study also highlights the existence of a weak direct link between the democratic accountability measure of institutional performance and growth, as the attainment of multi-party rule has not delivered since 2006.

In chapter 4, the main research objective is to understand why fiscal deficits are becoming difficult to manage and control, especially in Africa, because large and chronic fiscal deficits profoundly concern policymakers and development agencies due to their macroeconomic implications, they can lead to a debt crisis, undermine a country's ability to conduct prudent countercyclical fiscal policy, affect invest confidence in the economy, and undermine a country's competitiveness. Using the opportunistic 'political business cycles' approach, we seek to understand whether governments in Africa have been able to implement the deflationary phase of the cycle to bring down fiscal deficits after the election as claimed by the political economy literature. We also consider the medium-term effects of natural resource endowments, focussing on the role of 'boom-bust' cycles and management of natural resource revenues in this process. Finally, we consider the effectiveness of external and internal institutions, through foreign aid and policy reforms in promoting fiscal discipline.

Our empirical approach employees 'qual-quant' methodology. In the quantitative part of the analysis, a standard dynamic model that captures the essence of the Nordhaus-type opportunistic approach is augmented by measures of the natural resource endowments and domestic and external institutions and estimated on a sample of 42 African countries for the period 1980-2017. Our main estimating techniques are the robust *OLS, fixed effects* and the instrumental variable estimator *3SLS.* The *random effects* estimator is utilised to test the robustness of our findings. Regardless of the estimation methods, our results confirm the existence of strong fiscal policy manipulation during elections (as suggested by the negative and statistically significant coefficient on the election variable $Elect$). We have found evidence that in most African 'political business cycles' the pre-election boost is not counterbalanced by the post-election cutback, as governments are typically afraid to enforce one because of the weak political base. The coefficients on the two variables created to measure capture the conduct of fiscal policy after elections, $Postelect1$ and $Postelect2$, emerge positive and negative, respectively, but both are statistically insignificant, suggesting that on average pre-election surges in fiscal deficits have been hard to reverse, thereby presenting African governments with an unpleasant choice of surrendering to the cycle and thus causing a temporary deficit to persist. The results also show that natural resource intensity can impose on fiscal costs in the medium term mainly through weak tax effort and poor management of resource revenues.

The qualitative evidence indicates that the sharp increase in the Zambia's budget deficit since the mid-2000s, and this is linked to three factors: Zambia's increasing democratisation has expressed itself in increasingly weak government resistance towards demands for higher public expenditure around elections as noticed during the elections in 2001, 2008 and 2015; an extraordinarily generous (and secretive) treatment of the tax liabilities of most of the mining corporation and poor management of resource revenues as during years of higher resource revenues, spending expanded substantially, due to political pressure from urban populations. For example, much of the copper booms of the late 1960s and early 1970s were spent on the extraordinary expansion of the role of the state, rapid expansion of basic services and an attempt at industrialisation, but during the slump government was unable to rollback spending, and instead financed the gaps by borrowing. The inability of the government to control the fiscal deficit and the extensive borrowing that followed resulted in one of the worst economic declines seen in

Africa, as the country dropped from being one of the most prosperous at independence to one the highest indebted on the continent by the late 1980s. During the boom between 2005 and 2008 proceeds were channelled towards a large scale but uneconomical roads project, expansion of poorly designed and targeted agricultural subsidies and public sector wages, which again were difficult to rollback when the boom was over. As we discovered in chapter 2, natural-resource intensive economies such as Zambia have not just failed to successfully introduce new taxes which can recoup a fairer share of revenues from the resource sector, because mining companies are so powerful to compel government not to force heavier taxes for them to pay, but have also tended to be slack in their imposition of corporate taxation, making it difficult to restrain the public sector deficit and, of course, setting a bad example to other taxpayers by failing to encourage timely payment of taxes.

Finally, we find that because of the poor relationship Zambia has historically had with donors, and more recently the increased availability of diversified sources of financing such as Chinese loans and commercial borrowing which do not impose strict fiscal responsibilities, its ability to finance pre-election boosts has not depended on the relationship with traditional aid donors. The reclassification of the country to lower middle-income status in 2011 caused some traditional aid donors to reduce development assistance and forced the country into diversifying its sources of development finance, thereby reducing its ability to capture aid finance. As recently as 2015, the government postponed an IMF bailout package in an election year but still succeeded in financing a pre-election boost, which produced one of the largest fiscal deficits in the country's recent history. This evidently suggests that traditional donors have had influence on the conduct of fiscal policy, including around election time, in small open economies such as Zambia, and thence some ability to restrain budget deficits; but such influence may not be effective where a recipient country has access to diversified sources of financing.

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