



ECONOMIC ANALYSIS OF POLITICAL INSTABILITY IN AFRICA

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博士論文

平成 29 年 12 月

神戸大学大学院経済学研究科

経済学専攻

指導教員 玉岡雅之

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(アフリカにおける政治的不安定性の経済分析)

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GADONG TOMA DALYOP

ABSTRACT

Economic analysis is in the main part concerned with achieving and improving on certain optimal conditions that are necessary for maintaining an optimally functioning economic system that in turn maximizes the total welfare of the society. While this is necessary for maintaining the full functioning of individuals and systems in the economy, the maintenance of a stable socio-political environment is essential to the achievement and maintenance of the optimal economic state. Political instability, especially of a violent nature, generates adverse effects on the economy, in at least the short-term, which run counter to the objective of maintaining an optimal level of economic performance. Countries in Africa have experienced varying levels of political instability over the recent decades. These countries, most of which are resource-rich, have endured significant levels of economic instability and underdevelopment, a situation commonly referred to in the literature as the *resource curse*. The economic analysis of political instability in Africa analyses the relationship between economic conditions and political instability through the analysis of how variables that include natural resource rents and taxation, the tax structure, fiscal deficit and economic growth relate with political instability. The analysis applies mainly secondary data from publicly available sources and covers up to 52 countries in Africa, with chapters of the analysis covering various periods between 1980 and 2013. The results found show that higher values of natural resource rent relative to total tax are related to higher levels of political instability. Similarly, higher values of direct tax relative to indirect tax are also directly related to higher levels of political instability. Furthermore, longer durations of conflict have been found to increase the level of fiscal deficit. Moreover, a bi-directional direct relationship is found between political instability and economic growth, with wider fluctuations in economic growth rates being correlated with higher levels of political instability. The analysis concludes that there is a significant relationship between the economic conditions covered in the analysis and political instability. Changes in these economic conditions influence the level of political instability, and are, in some cases, the result of political instability.

The LORD is my shepherd.

Psalm 23:1, The Holy Bible, NLT

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Economic analysis is in the main part concerned with achieving and improving on certain optimal conditions that are necessary for maintaining an optimally functioning economic system that in turn maximizes the total welfare of the society. While this is necessary for maintaining the full functioning of individuals and systems in the economy, the maintenance of a stable socio-political environment is essential to the achievement and maintenance of the optimal economic state. Political instability, especially of a violent nature, generates adverse effects on the economy, in at least the short-term, which run counter to the objective of maintaining an optimal level of economic performance. Countries in Africa have experienced varying levels of political instability over the recent decades. In the most recent years, there have been uprisings such as the Arab Spring revolts in the North African states of Tunisia, Egypt and Libya, as well as, conflicts in Sudan and South Sudan, the Democratic Republic of Congo and the Central African Republic, as well as, in Nigeria and Cote d'Ivoire (Ivory Coast). Incidences of conflict on the continent appear to occur more frequently than they do in other parts of the world.

Many of the countries in Africa are resource-rich. The exploitation of natural resources affords financial resources to resource-rich countries to invest in projects and programmes that promote development. However, in most resource-rich countries, the expectations that revenue from natural resource exploitation would bring about rapid economic development have been largely unmet. The countries consequently have poor economic performance, weak institutions, and/or conflict. Previous studies (Parvin, 1973; Collier & Hoeffler, 2011) have found that primary resource dependence increases the propensity for political unrest and war. This situation has been widely described as the *resource curse* (Rosser, 2006; Weinthal & Luong, 2006; Stevens & Dietsche, 2008). In addition, the dependence of resource-rich countries on revenues from natural resource exploitation has also resulted in the substitution of tax in financing public expenditure, and thus breaking an important channel of citizen-government communication. The weakening of legitimate channels of communication thus increases the vulnerability of the state to subversive actors.

Raising taxes, however, has the potential for generating disaffection in the taxpayer. This has been seen in incidences of riots and protests, as well as, strikes against the imposition or increase of taxes, such as the cases in Ethiopia in February 2005, in Burkina Faso between February and April 2010, and in the Democratic Republic of Congo in July and December of 2014, and in November of 2015. The imposition of tax has in other cases, such as that of Tunisia in February 2015, served as a catalyst for the expression of discontent regarding existing economic conditions, such as unemployment, and general dissatisfaction with governance (Raleigh, Dowd, & Moody, 2015). The structure of different

taxes creates different perceptions regarding the cost of government. While direct taxes tend to be less complex with fewer collection points, indirect taxes are more complex with many collection points (Wagner, 1976). Consequently, payments of indirect taxes are sometimes indiscernible, as in the case of the value-added tax, which is characterised by multi-staged tax payments, and therefore the perceived cost of government is lowered. In addition, given the longer duration between successive payments, the per transaction payment of direct taxes tends to be larger than the per transaction payment of indirect taxes. As a result, the reaction of the taxpayer to different taxes may differ. A greater feeling of disaffection may adversely influence the level of political stability.

Political instability, and in particular the occurrence of conflict, raises the need for more government expenditure in order to restore the state of order and to provide relief for those adversely affected by the conflict. However, the occurrence of conflict destroys the economic capacity of the economy and consequently diminishes its tax generation capacity. Circumstances like these adversely affect the fiscal balance. While some studies (Persson & Svensson, 1989; Alesina & Tabellini, 1990) have shown that the level of fiscal deficit is the result of political decisions of incumbents in politically unstable societies aimed at constraining the policies of political opponents, should the opponents take over power, other studies, including Brück (1997), have shown fiscal deficit to be the result of political instability, which constrains the revenue generating capacity of the government.

The consequences of political instability exert negative influences on the performance of the economy. The destruction of human and material resources, as well as the transactional infrastructure required for the exchange of both financial resources, and goods and services, occasioned by instances of conflict, slows down the growth process of the economy. Economic growth in especially unstable climates declines significantly, as a result. Furthermore, just as much as political instability influences the rate of economic growth, so does the rate of economic growth influence the level of political instability. Political actors, in the pursuit of political power, seek out indications of popular discontent (Londregan & Poole, 1990). Slow, or even negative, economic growth results in the underemployment of resources, including human resources. In addition, fluctuations in the rate of economic growth may raise the level of uncertainty, as this may be a signal to policy weaknesses and may thus result in lowered investment and consequently, lower future growth. These circumstances generate discontent about the present and uncertainty about the future and thus create the ideal conditions for political instability.

This dissertation on the economic analysis of political instability in Africa studies the relationship between economic variables and political instability in Africa. It studies how economic variables, including natural resource rents and the resulting influence on taxation, as well as, the tax structure, cause political instability, on the one hand, and how political instability causes changes in economic variables such as fiscal deficit, on the other hand. The dissertation is made up of four papers, presented in chapters two, three, four and five, which, respectively, study resource rents, taxation and

political instability in Africa; the tax structure and political instability in Africa; the determinants of fiscal deficit in conflict-affected states in Africa; and political instability and economic growth in Africa.

1.2 Objectives of the study

The overriding objective of this study is to determine the relationship between economic variables and political instability. In particular, the study shall focus on the relationship between political instability and economic variables that include resource rents, taxation and its structure, and fiscal deficit. How each of these variables, individually or in interaction with others, influence the level of political stability or are influenced by the level of political instability shall be the preoccupation of this study.

1.3 Research problems and research hypotheses

The economic analysis of political instability in Africa considers, respectively, the relationship between political instability and resource rents, taxation and its structure, fiscal deficit, as well as, economic growth. The analysis shall, therefore, seek to answer the following sets of research questions on the respective topics:

A. Resource rents, taxation and political instability in Africa

High natural resource rents are not only an incentive for rent seeking, which increases the competition for political power, but are also a disincentive to levying tax from other sources in resource-rich countries. The resulting low tax collection reduces the need to maintain structures of state needed for tax administration at the peripheries, thus, reducing government-citizen interface and public accountability. Noting the consequent weakening of the state, the analysis on resource rents, taxation and political instability in Africa shall, through the following research questions, seek to determine the influence of natural resource rents on political instability.

1. Does a relationship exist between resource rents and political instability? If there is a relationship, what is the nature of the relationship?
2. Is there a relationship between taxation and political instability? If there is, how does taxation influence political instability?
3. Does a relationship exist between resource rents and taxation? If a relationship does exist, how do resource rents affect taxation?
4. If a relationship exists between resource rents and taxation, does this relationship have an influence on the level of political stability?

B. Tax structure and political instability in Africa

Raising taxes to finance the business of government has the potential for causing disaffection among taxpayers or act as a catalyst for the expression of discontent regarding existing economic conditions and/or general disaffection with governance. The analysis of the tax structure and political instability in Africa shall seek to ascertain if different types of tax have an influence on the level of political instability through answers to the following questions:

1. Does the tax structure have a relationship with the level of political instability? If it does, how does it influence the level of political stability?
2. Do fluctuations in the sizes of components of tax affect the level of political stability? If they do, how wide must these fluctuations be, to become noticeable?

C. Determinants of fiscal deficit in conflict-affected states in Africa.

The increased military spending occasioned by a conflict situation, as well as, relief spending to cushion the effects of the conflict situation at a time when government revenue would have declined as a result a decline in economic productivity brought about by the destruction of material and human resources caused by the conflict situation, would inevitably put pressure on the fiscal balance. Besides, spending on patronage in politically unstable environments may additionally impact upon the fiscal balance negatively. The study on the determinants of fiscal deficit in conflict-affected states in Africa would, therefore, seek to ascertain the following:

1. Is there a relationship between the frequency of government change and fiscal deficit?
2. Does the occurrence of conflict affect the fiscal balance? If it does, through what channel(s) is this effected?
3. Do pre-existing economic conditions affect the fiscal balance?

D. Political instability and economic growth in Africa.

The decline in economic productivity, as well as, the transactional capacities of an economy brought about political instability, especially when it is of a violent nature, has adverse consequences for investment and thus future economic growth, a situation which in turn creates a fragile socio-political environment. The analysis of political instability and economic growth in Africa shall, therefore, seek to answer the following research questions:

1. Is there a relationship between political instability and economic growth? If there is a relationship, what is the nature of the relationship?
2. Are fluctuations in the rate of economic growth correlated with the level of political instability?

Overall, the study would, therefore, seek to determine if a relationship exists between economic conditions and political instability.

The main research (null (H_0) and alternative (H_1)) hypotheses arising from the aforementioned sets of research questions are stated, respectively, as follows:

- A. H_0 : The interaction of resource rents and taxation does not have a significant impact on political stability.
 H_1 : The interaction of resource rents and taxation has a significant impact on political stability.
- B. H_0 : The tax structure does not have a significant impact on the level of political instability.
 H_1 : The tax structure has a significant impact on the level of political instability.
- C. H_0 : Political instability, measured by the frequency of government change and the duration of conflict, does not have a significant impact on the fiscal deficit.
 H_1 : Political instability, measured by the frequency of government change and the duration of conflict, has a significant impact on the fiscal deficit.
- D. i. H_0 : Political instability does not have a significant impact on the level of economic growth.
 H_1 : Political instability has a significant impact on the level of economic growth.
ii. H_0 : Economic growth does not have a significant impact on the level of political instability.
 H_1 : Economic growth has a significant impact on the level of political instability.

For the study, as a whole, the hypotheses to be determined through the determination of the preceding hypotheses are also stated as follows:

- H_0 : Economic variables do not have a significant relationship with political instability.
- H_1 : Economic variables have a significant relationship with political instability.

On a priori basis, all the null (H_0) hypotheses are expected to be rejected. It is, therefore, expected that, given the often-disruptive influence of political instability on the level of economic activity, the economic variables under research would have a significant relationship with political instability.

1.4 Research methodology

The study shall mainly apply secondary data in the economic analysis of political instability in Africa. The variables variously included in the analyses are political (in)stability indicators, direct tax, indirect tax, total tax, seigniorage (which is a product of the inflation rate and high-powered money), natural resource rents, fiscal deficit (the inverse of net government borrowing/lending), per capita Gross Domestic Product (GDP), growth rate of the real GDP, consumption, domestic credit to the private sector, urbanization, secondary school enrolment, the current account balance, foreign direct investment, merchandise trade, net exports and grants. The data are variously sourced from the World Development

Index and World Governance Index datasets by the World Bank, the World Economic Outlook of the International Monetary Fund, the International Centre for Tax and Development (ICTD) Government Revenue Dataset, and the Uppsala Conflict Data Program/ Centre for the Study of Civil Wars, Peace Research Institute Oslo (UCDP/PRIO) Armed Conflict Dataset, Version 4-2015.

The analytical methods applied variously across the sections of the study include the fixed-effects regression and two-way fixed effects regression methods, and the one- and two-step system generalized method of moments. To ascertain the validity of the results, the analyses variously include the coefficient of determination (R^2), the F-test, the Arellano-Bond (1991) test for autocorrelation, and the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991). The analyses, in all cases, make use of the robust standard errors.

1.5 Scope of the study

The study is on the economic analysis of political instability in Africa. The different sections of the study analyse data from up to 52 (out of the 54) countries in Africa. Somalia and South Sudan are excluded in all sections of the study due to the insufficiency of data from these countries. Furthermore, sections of the study cover various periods between 1980 and 2013.

1.6 Significance of the study

This study is significant in its timing as the continent of Africa has in recent times been home to upheavals including the Arab Spring in the north; government overthrow in Burkina Faso and Mali, and Boko Haram attacks in Nigeria, in the west; armed insurrections in the Central African Republic, in the centre, and in Burundi, in the east; and student protests in South Africa, in the south, among others. All of these events destabilize the system and potentially generate adverse economic effects.

The study is also significant in its scope, considering that Africa, although rich in resources, has large proportions of its inhabitants living in poverty. When the fact that the continent is demographically young is brought into consideration, it becomes clearer what the potential for socio-political conflagration is. The aforementioned cases of upheavals are only a sample of the many incidences of social unrest across the continent.

Moreover, the study is significant in its effect as it researches into the relationship between economic conditions and political instability. While significant research continues to be carried out in order to achieve some optimal economic conditions that maximize the welfare of society as a whole, the achievement of these optimal economic conditions relies on the existence of a considerably stable socio-political and economic environment. Research into factors that could alter an otherwise stable

socio-political environment is, therefore, necessary in order to potentially pre-empt and thereby prevent the occurrence of these undesirable states.

1.7 Outline of the study

The study is presented in six chapters, the first of which is the introduction. Chapter two, on resource rents, taxation and political instability, studies the relationship between resource rents and taxation, and how the interaction between resource rents and taxation affect the level of political instability by creating incentives for rent-seeking while weakening the citizen-government connection. Chapter three researches into the tax structure and political instability. Here, research is done into how the interaction between direct and indirect tax affects the perception of the taxpayer as regards the cost of government and the consequent political reaction of the taxpayer. The determinants of fiscal deficit in conflict-affected states in Africa are studied in chapter four. The chapter researches into the effects that conflict and other pre-existing economic conditions bring to bear on the fiscal balance. Chapter five is on political instability and economic growth in Africa. It investigates the relationship between the rate of economic growth and the level of political instability from a bi-directional perspective. Additionally, the chapter analyses the influence of fluctuations in the growth rate on the level of political instability. Finally, chapter six presents the study's conclusion and implications for policy and/or further research.

CHAPTER TWO

RESOURCE RENTS, TAXATION AND POLITICAL INSTABILITY IN AFRICA

Abstract

This chapter on resource rents, taxation and political instability in Africa examines the relationship between natural resource rents and taxation, and their joint influence on political instability. High natural resource rents are an incentive for rent seeking, which increases the competition for political power. Moreover, natural resource rents reduce the incentive to levy tax from other sources in resource-rich countries. The reduction in tax collection, consequent upon the high natural resource rents, on the other hand, reduces the need to maintain structures of state at the peripheries that pertain to tax collection, and also reduces the citizens' demand for political representation and government accountability. The combination of these factors thus makes the control of government extremely attractive to political actors. This study, therefore, proposes that the value of natural resource rents relative to that of total tax serves to indicate to political actors the potential benefits of holding power, and consequently determines the level of political instability. Using data from 52 African countries from 1996 to 2013, the research finds an inverse relationship between the natural resource rent-to-total tax (NRT) ratio and political stability. This shows that larger natural resource rents relative to tax raise the level of political instability.

Keywords: Rent seeking; taxation; political instability

JEL Classification Numbers: D72, D74, H20

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2.1 Introduction

The exploitation of natural resources affords financial resources to resource-rich countries to invest in projects and programmes that promote development through foreign exchange earnings, which help to fill domestic savings shortages and allow for the importation of capital goods. However, the experience from most natural resource-abundant countries has been that the expectations that revenue from natural resource exploitation would be utilized in a way that would generally benefit their economies have been largely unmet, thus leaving the countries in a state of underdevelopment, characterized by poor economic performance, weak institutions, and authoritarian regimes and/or conflict – a situation widely referred to as the *resource curse* (Rosser, 2006; Weinthal & Luong, 2006; Stevens & Dietsche, 2008).

For countries in Africa, most of which are resource-rich, the large flows of revenues from natural resources have meant that these countries have become dependent on natural resources to finance public expenditure. The resulting rentier nature of these states has been attributed as the reason for the more elaborate structures of the state that pertain to social welfare and state production than those that pertain to regulation and supervision of the economy and domestic taxation (Rosser, 2006). As a consequence, natural resource rents have tended to substitute taxation as a means of public revenue generation.

Natural resource rents, which are taxes on natural resource exports or royalties on natural resource production, have been found to reduce the incentive to levy tax from other sources in resource-rich countries (Daude, Gutiérrez & Melguizo, 2012). As a consequence, Daude, Gutiérrez and Melguizo (2012) add that resource-rich countries tend to substitute other sources of revenue including direct and indirect taxes. The result is lower than potential tax collection. Cobham (2005) stated that one important function of the tax system, besides revenue generation and redistribution, is political representation. Citing the claim of ‘no taxation without representation, Cobham (2005) noted that citizens may feel they have a lower stake in governance and policy outcomes when they do not pay to maintain the provision of the public good, and as a consequence, an important channel of pressure for political representation is undermined, leading to a less disciplined government. This thus leads to a reverse situation of ‘no representation without taxation’.

The nexus between taxation and representation is that a “social contract” is formed between the taxpayer and the government through the processes starting at the negotiations on what the applicable tax rates should be (through parliamentary deliberations) through to the payment of the tax and subsequent implementation of government policy and finally to the processes of public accountability. This raises the public consciousness on the government finance and compels the government to account for its finances. To the contrary, low tax collection breaks the citizen-government connection.

Individuals in some cases come to consider the provision of public goods, funded through rents, as acts of benevolence by the government rather than the obligation of government to society.

A situation where the social contract between the government and the public is not formed creates an avenue for the incumbent government to seek to maximize its own utility even at the expense of that of the public. However, the existence of some other party (which may be an individual, social or political group), different from the incumbent, which desires to also control or appropriate those rents in order to maximize its own utility or that of the public, would result in a contest for the possession of political power. Leveraging on the citizen-government disconnection, the opposition seeks out avenues for generating public discontent, including through the use of propaganda (Mbaku & Paul, 1989).

This research examines the relationship between resource rents and taxation and their joint influence on political instability. Political instability tends to be high in countries on the African continent. This is evident in the intermittent eruption of strikes, civil unrest and wars, and the, sometimes, irregular changes in government. Being resource-rich, the African continent thus provides a good area for research on resource rents, taxation and political instability. This research is unique in its approach to the analysis of the relationship between resource rents and political instability by considering resource rents in relation to taxation, thus accounting for the level of citizen participation in governance.

The chapter is presented in five sections. In the second section, the research examines how taxation is influenced by resource rents. The impact of the interaction between resource rents and taxation on the level of political instability is studied in the third section. In this section, a historical review of the relationship between the citizen and the state via the payment of tax, and how this influences the participation of the individual in governance, with its resultant effect on political stability, is carried out. In the same section, the research proposes that the level of political stability is determined by the natural resource rent-to-total tax ratio. The fourth section contains an analysis of data on the relationship using data from 52 African countries for the period 1996 to 2013. The analysis employs a dynamic model that accounts for the possibility of endogeneity among the variables. Further analyses test for the robustness of the results found. A conclusion is made in section five.

2.2 Resource rents and taxation

Daude, Gutiérrez and Melguizo (2012) defined tax morale as the motivation of a country's citizens to paying taxes, in addition to legal obligations. A conceptual foundation of the concept of tax morale may be found in the concept of income redistribution. Based on the political economy model for preferences for redistribution developed by Meltzer and Richards (1981), which was built upon Romer (1975), Alesina and Giuliano (2009) expanded on the model for the preferences for

redistribution. The model is based on the assumption that individuals care only about their consumption and have different productivities. Based on the median voter theorem, which holds that in a majority rule, the decisive voter is the median voter, this model specifies that the equilibrium tax rate is the one that maximizes the consumption of the voter with the median productivity. As a consequence, the larger the income (or productivity) of the average voter relative to that of the median voter, the higher the tax rate. Simply put, the median voter would prefer a higher tax rate when his income is far below the average (or mean) income. Consequently, there would be a greater desire for redistribution in a society where there is greater inequality.

An extension to the preceding model is one that optimizes consumption over two periods. In this case, the tax rate is decided in the first period and remains fixed in the second period. When the median voter, while trying to maximize total consumption over the two periods, expects to earn a larger income in the second period relative to the first, he would prefer a lower tax rate than would have otherwise been the case. The expectation of future social mobility thus influences the median voter's decision with regard to what he would consider to be the appropriate tax rate (Alesina & Giuliano, 2009).

Empirical studies have found the determinants of tax morale to include socio-demographic characteristics, such as age (Torgler, 2004), gender (Torgler, 2004), and religion (Torgler, 2004; Lago-Peñas & Lago-Peñas, 2010). Other determinants are marital status (Torgler, 2004), personal financial (economic) status (Torgler, 2004) and employment status (Torgler, 2004); political and institutional determinants, such as, satisfaction with democracy (Lago-Peñas & Lago-Peñas, 2010), trust in the government/politicians (Torgler, 2004; Lago-Peñas & Lago-Peñas, 2010) and the legal system (Torgler, 2004; Hug & Spörri, 2011); ethno-linguistic fractionalization (Lago-Peñas & Lago-Peñas, 2010); national tax arrangements, such as, the national tax burden, the change in the national tax burden, and the direct tax burden (Lago-Peñas & Lago-Peñas, 2010); as well as, natural resource rents (Lago-Peñas & Lago-Peñas, 2010; Daude, Gutiérrez & Melguizo (2012)).

A rent, according to Beblawi (1987), is generally a reward for ownership of natural resources. Unlike other sources of income, including wages and profit, rents are rewards and prizes not earned or not consistent with competitive market returns (Congleton et al, 2008). Rents are typically generated from the exploitation of natural resources, not from production (labour), investment (interest), or management of risk (profit) (Wantchekon, 2002).

In a rentier state, the demand for higher tax rates when the median income is lower than the average income is substituted by the rent. The existence of natural resource rents thus reduces the incumbent's incentives to levy taxes from other sources. Daude, Gutiérrez and Melguizo (2012) found evidence that resource-rich countries tend to substitute other sources of revenue, including direct and indirect taxes.

Besides, rentier states depend substantially on external rents. Beblawi (1987) states that the external nature of the rents is crucial to the concept of a rentier economy because the existence of a pure internal rent cannot be sustained without the existence of a robust domestic productive sector, which would thus connote the existence of a rentier class and a productive class, between whom, the internal rent is a domestic payment transfer in a productive economy. An external rent, on the other hand, can, if substantial, sustain the economy in the absence of a strong domestic productive sector. Consequent upon the external nature of the rent, only a few economic actors are engaged in the generation of the rent, with the majority involved only in the distribution or utilization of the rent (Beblawi, 1987; Wantchekon, 2002). The disconnection of a large proportion of the public from the processes involved in the generation of the rent, creates the perception that the provision of the public good, without having paid commensurate taxes, is an act of benevolence by the incumbent. From another perspective, the public may view the public good as an entitlement that must be received regardless of non-tax payment. Either way, a low tax morale results and the level of taxation falls.

2.3 Resource rents, taxation and political instability

The literature on the “resource curse” has noted varied outcomes in countries with an abundance of natural resources. Poor economic outcomes have been found by Isham et al (2005) to be especially reflected in countries dependent on “point source” natural resources, including oil and minerals, and less so in countries with more diffuse natural resource exports such as livestock and agricultural output from small-holder farms. Common among these countries are lower than expected levels of development and weak political institutions, as compared to resource-poor countries (Ross, 1999; Sala-i-Martin & Subramanian, 2003).

The diversion of activities and resources away from productive employment towards competition for resource rents has been adduced as a reason for the often-poor economic performance of resource-rich countries (Karl, 1997; Deacon & Rode, 2012). Because of the higher returns from rent-seeking, there is a conversion of entrepreneurial talent away from wealth creation towards rent-seeking activities (Karl, 1997). The natural resource in resource-rich countries thus elicits a political contest to capture ownership of the rents, as higher resource rents make it more attractive to challenge the incumbent (Caselli & Cunningham, 2009; Bjorvatn & Farzanegan, 2015). This is unlike the case in resource-poor (that is, low-rent) countries where the government must motivate the citizenry to create wealth from which it can levy taxes to finance the public budget (Frankel, 2012).

The causal relationship between resource wealth and the quality of institutions appears to be bi-directional. Having weak institutions initially predisposes resource-rich countries to poor economic outcomes (resource curse), on the one hand, while resource windfalls can alter the quality of political institutions by altering property rights, democracy, political stability, or friendliness to rent-seeking, on

the other hand (Deacon & Rode, 2012). For the former case, Wantchekon (2002: 11) noted that Nigeria, for example, had a weaker state capacity when oil was discovered, which resulted in the central government having more discretion over distributive policies. This consequently led to a more centralized federal system and incumbency advantage, leading excluded or marginalized groups to revert to non-constitutional means of political competition that led to political instability and repressive political rule. In Botswana's case, although resource abundance also generated incumbency advantage and one-party dominance, the existence of strong systems of checks and balances led to a non-authoritarian government and the absence of socio-political instability. This is in spite of the fact that the one-party dominance limited electoral competition in the country (Wantchekon, 2002: 16; Acemoglu, Johnson, & Robinson, 2003).

The windfall from natural resource rents weakens institutions by providing political office holders with resources to be used in different forms of patronage or strategic spending, tax cuts, or political oppression in order to increase their chances of surviving in political office (Andersen & Aslaksen, 2013). The incumbent government in the rentier state uses strategic spending or patronage to 'buy peace', and to diffuse political pressure for greater accountability and to democratize, or even employ the use of internal security to suppress dissent (Ross, 2001; Rosser, 2006; Bjorvatn & Farzanegan, 2015). Moreover, by lowering tax rates, besides the already low tax morale resulting from the high natural resource revenue, the channels for political representation are undermined (Stevens & Dietsche, 2008; Frankel, 2012). Citing Schumpeter's ([1918]1991) argument that a country's tax system fundamentally reflects its political institutions, Moss, Pettersson and van de Walle (2006: 10) state that "reliance on citizens for raising public revenues, as opposed to unearned income via offshore extraction or external assistance, is considered an essential ingredient to establishing accountability between the state and society." This is because, as Sala-i-Martin and Subramanian (2003) note, resources raised from taxes are much more difficult to mismanage than those that "fall from the sky like manna". Consequently, although political survival policies may be politically rational, as they help in maximizing the private objective of the incumbent government, they turn out to be economically inefficient, leading to poor collective outcomes (Stevens & Dietsche, 2008).

Moore (2004: 299) identified distinguishing factors that may explain the origins and institutionalization of representative government in western Europe, especially in Great Britain, in contrast to "deficiencies and pathologies of political constitution" of many developing states. While there was a "strong synergy between the degree of dependence of rulers on tax revenue, the emergence of representative government, and the strength and resilience of the state in the context of interstate competition" in western Europe, the deficiencies in many developing states could be "traced to a high level of dependence on natural resource rents (especially oil and minerals) and strategic rents (especially foreign aid), rather than taxes" (Moore, 2004: 299).

The causal model of the connection between taxation and representation posited by Moore (2004) comprised of some important elements. First is the need to raise tax to finance the military in order to ensure the survival of the state. This is most plausible in the face of continual threat or reality of interstate war (Karl, 1997: 63; Moore, 2004). The second has to do with coercive taxation in especially agrarian societies without taxpayer political representation, which could generate resistance, where effective, or lead to a flight of the taxpayers to other jurisdictions, where the taxpayers' line of trade permitted. The third is consensual taxation whereby a taxation regime is agreed upon between rulers and the representatives of taxpayers. Since this is based on agreed terms, compliance is greater and the collection costs are thus lower, and the tax revenue more predictable. Besides, due to the bargaining involved, the policies pursued under this tax regime are mutually beneficial to the parties, and the taxpayers are more amenable to increases in the tax rate during emergencies. Furthermore, wastage and corruption are reduced, and the rulers place a greater stake in the prosperity of the citizens, from whose prosperity the state can generate more revenues. Moore (2004) adds that consensual taxation is even more preferable to rulers where capital is mobile and the owners of capital may very easily move their capital to other jurisdictions that offered better terms of taxation. Consensual taxation could thus be summarized by "no taxation without representation" (Frankel, 2012: 9).

In rentier states, however, the absent need for the incumbent government to depend on the citizenry to finance the business of government breaks the cord that spans the taxpaying-representation nexus. The incumbents in these states, therefore, tend to be autonomous from the citizens (Wantchekon, 2002), on the one hand, while being susceptible to external influences, on the other. Without financing the business of government, the incentives for civic participation in politics is diminished because citizens lose the consciousness of ownership of the public revenue and thus the sense of a right to influence its use. This state of affairs reinforces and is as well reinforced by non-transparency in the public finance since public revenue accrues to the incumbent from a small number of concentrated sources and is thus relatively easier to conceal from public scrutiny (Moore, 2004).

Furthermore, rentier states have ineffective public bureaucracy since there is little need to raise taxes domestically from the citizenry, and hence little need to structure an effective system to manage a complex tax system. The consequent absence of a significant tax apparatus at the peripheries of the state implies the absence of significant governance structures in the grassroots, which increases vulnerability towards subversion by organized insurgents that seek to fill the void to their own advantage. These insurgents and indeed members of the military, conscious of the windfalls accruing to the incumbent by way of rents, as well as, the non-transparency in public finance, and thus the potentially very high rewards from taking over the state by force, do resort to coups and counter coups. The low state capabilities increase the vulnerability of the rentier state (Moore, 2004; Fearon, 2005).

The foregoing thus shows that while taxation and the structures required to implement it require the maintenance of the structures of state at the centre and peripheries, and may thus strengthen the capacity of the state, on the one hand, the availability of rents diminishes the need for taxation and thus the quality of structures required to generate tax revenues, which as a consequence weakens the capacity of the state, on the other hand. Here, we see a trade-off between rents and taxation and their opposite effects on state capacity and thus political stability. We, thus, can argue that higher resource rents relative to tax weaken the capacity of the state and thus create conditions for political instability. Hence, countries that collect greater amounts in rents relative to their tax collection, resulting in weaker structures of taxation, and thus weaker structures of state, as a consequence, would be more susceptible to political instability. The converse would be true for countries that collect greater amounts in tax relative to resource rents and would necessarily have a significant state apparatus to effectively collect tax and implement state policy, as well as, ensure effective public accountability. The relationship between rents and taxation thus also becomes an indicator for political stability by indicating to political actors the level of citizen participation in governance, which would, in turn, indicate the level of benefits accruable to these political actors should they hold political power.

Greater resource rents relative to tax thus signals to the opposition (or indeed any party outside the incumbent government) of a lucrative prize, which if won, affords the winner significant returns without so high a level of scrutiny from the citizenry. Thus signalled, a contest for political power ensues that raises the level of political instability. Political stability is thus a function of the ratio of total natural resource rents-to-total tax.

$$Political\ Stability\ (PS) = f\left(\frac{Total\ Natural\ Resource\ Rent}{TotTax}\right) \quad (1)$$

2.3.1 The situation in Africa

In most of the African countries under study, most of which are resource-rich, the tax-to-GDP ratio is quite low. The average total tax-to-GDP ratio for the period between 1980 and 2013 is 13.4 percent. The average total tax in most of the countries is below 20 percent of GDP, with Nigeria having the lowest ratio of 4.7 percent. An exception to the rule is Lesotho, where average total tax is 42 percent of GDP.

A commonly cited case of political stability in Africa in the literature is Botswana (Wantchekon, 2002; Acemoglu, Johnson, & Robinson, 2003). Although rich in minerals, particularly diamond and copper-nickel, Botswana still raises an average annual tax as a percentage of GDP greater than the rents received from natural resources, as shown in the table in Table 2-1. A similar total natural resource rent-total tax situation is found in Benin, Cabo Verde (Cape Verde), Lesotho, Mauritius, Namibia, Seychelles, and Sao Tome and Principe, all of which are relatively politically stable and, except for

Lesotho, were not engulfed in internal conflict in the period between 1980 and 2013. At the other extreme, Libya, Democratic Republic of Congo (DRC), Nigeria, Angola, Republic of Congo, Equatorial Guinea, Guinea-Bissau and Chad are countries where the annual total receipts of natural resource rents far exceed the total tax. All of these countries are significantly politically unstable and all, except for Equatorial Guinea, were affected by internal conflict in the same period.

Mauritania's average total tax as a proportion of GDP for the period 1980 – 2013 of 12.6% is much higher than the DRC's 5.6%, which, when computed on an annual basis, gives average annual total natural resource rents-to-total tax (NRT) ratios of 2.1 and 9.8 for Mauritania and the DRC, respectively. Despite their quite comparable average total natural resource rents as a proportion of GDP of 22.5% and 23.7%, respectively, for the same period, Mauritania is less politically unstable than is the DRC, and has, on the average, had fewer months of conflict per year. While both countries are endowed with crude oil, gold and copper, a greater proportion of Mauritania's rents are from minerals while the DRC's are from forest resources.

Kenya and Namibia have identical average total natural resource rents as a proportion of GDP of 4.3% for the same period. However, Kenya's average total tax as a proportion of GDP for the period at 13.8% is about half that of Namibia's 26.4%, with respective average annual NRT ratios of 0.3 and 0.1. Kenya is more politically unstable than Namibia. An almost identical situation is also found when Sierra Leone is compared to Zambia, with the former being more politically unstable than the latter.

With regard to the level of total tax, the average total tax as a proportion of GDP in Liberia and Mauritius for the same period is 17.3% and 17.5%, respectively. However, compared to Mauritius' 0.03% in average total natural resources rents as a proportion of GDP, Liberia, rich in diamonds, gold and iron ore, among other resources, receives a very large 39% of its GDP in natural resource rents, giving an annual NRT ratio of 2.2 as against Mauritius' 0.002. Unsurprisingly, while Mauritius is politically stable, Liberia has been considerably politically unstable.

A similar situation is found for Benin, Burundi and the Gambia, whose respective average total tax as a proportion of GDP is 12.7%, 12.2% and 12.6%. While Benin and the Gambia, respectively, received average total natural resources rents as a proportion of GDP of 7.2% and 3.7%, with average annual NRT ratios of 0.6 and 0.3, Burundi's average total natural resources rents as a proportion of GDP for the period was 19.4%, with an average annual NRT ratio of 1.6. Both Benin and the Gambia were more politically stable than Burundi during the period 1980 – 2013.

Table 2-1 – Total natural resource rents, total tax, and political stability

Country	Average Total natural resource rents (% of GDP) 1980-2013	Average total tax (% of GDP) 1980-2013	Average Annual Total Natural Resource Rent-to- Total Tax (NRT) Ratio 1980-2013	Average Political Stability and Absence of Violence/ Terrorism: Estimate (1996-2013)	Average Frequency of government change (FGC) 1980-2013	Average Uppsala Internal Conflict Months1980- 2013
1 Algeria	28.4	11.7	2.7	-1.4	0.5	7.8
2 Angola	39.0	6.5	7.9	-1.0	0.2	7.9
3 Benin	7.2	12.7	0.6	0.5	0.1	0
4 Botswana	2.6	14.8	0.2	1.0	0.1	0
5 Burkina Faso	9.7	10.0	0.9	-0.2	0.3	0.0
6 Burundi	19.4	12.2	1.6	-1.8	0.3	4.6
7 Cabo Verde	0.6	15.3	0.04	0.9	0.1	0
8 Cameroon	12.0	10.2	1.2	-0.6	0.2	0.0
Central African Republic	9.5	9.0	1.1	-1.7	0.6	2.0
10 Chad	18.2	5.1	3.9	-1.5	0.6	7.9
11 Comoros	2.1	11.2	0.2	-0.3	0.4	0.1
12 Congo, Dem. Rep.	23.7	5.6	9.8	-2.3	0.7	3.0
13 Congo, Rep.	54.6	10.3	6.1	-0.9	0.4	1.2
14 Cote d'Ivoire	6.2	16.1	0.4	-1.5	0.3	0.9
15 Djibouti	1.0	23.5	0.05	-0.2	0.1	0.9
16 Egypt, Arab Rep.	16.1	12.2	1.1	-0.8	0.5	2.0
17 Equatorial Guinea	31.0	11.1	6.0	0.0	0.2	0
18 Eritrea	4.5	16.7	0.3	-0.8	0.03	4.3
19 Ethiopia	17.8	8.6	2.1	-1.4	0.2	10.5
20 Gabon	42.7	11.2	3.9	0.3	0.2	0
21 Gambia, The	3.7	12.6	0.3	0.2	0.03	0.0
22 Ghana	10.1	10.6	0.9	-0.1	0.1	0.1
23 Guinea	16.3	7.9	3.3	-1.5	0.4	0.3
24 Guinea-Bissau	18.8	5.0	4.4	-0.8	0.7	0.4
25 Kenya	4.3	13.8	0.3	-1.2	0.1	0.0
26 Lesotho	5.6	42.1	0.1	0.1	0.3	0.0
27 Liberia	39.0	17.3	2.2	-1.4	0.3	1.6
28 Libya	30.7	5.7	13.6	-0.2	0.5	0.3
29 Madagascar	5.9	9.7	0.6	-0.2	0.5	0.0
30 Malawi	9.1	14.6	0.7	-0.1	0.1	0
31 Mali	7.0	10.9	0.5	-0.1	0.5	1.4
32 Mauritania	22.5	12.6	2.1	-0.3	0.5	0.4
33 Mauritius	0.03	17.5	0.002	0.9	0.4	0
34 Morocco	2.0	20.3	0.1	-0.4	0.3	3.5
35 Mozambique	12.5	10.2	1.3	0.2	0.2	4.6
36 Namibia	4.3	26.4	0.1	0.7	0.2	0
37 Niger	8.7	9.1	0.9	-0.6	0.6	1.1
38 Nigeria	38.9	4.7	9.6	-1.7	0.2	1.2
39 Rwanda	7.4	10.0	0.8	-0.9	0.2	4.8
Sao Tome and Principe	1.3	9.9	0.1	0.4	0.7	0
41 Senegal	3.3	15.8	0.2	-0.3	0.4	2.4
42 Seychelles	0.1	28.8	0.003	0.9	0.03	0
43 Sierra Leone	12.6	7.0	2.2	-0.7	0.2	3.8
44 South Africa	4.7	25.0	0.2	-0.1	0.2	3.2
45 Sudan	6.8	7.0	1.1	-2.3	0.1	10.8
46 Swaziland	5.0	23.8	0.3	-0.2	0.4	0
47 Tanzania	6.5	8.6	0.9	-0.4	0.3	0
48 Togo	9.0	14.5	0.7	-0.4	0.4	0.0
49 Tunisia	7.1	19.2	0.3	0.0	0.3	0.0
50 Uganda	16.1	7.5	3.7	-1.2	0.3	11.0
51 Zambia	12.7	15.4	0.8	0.2	0.2	0
52 Zimbabwe	6.6	20.8	0.7	-1.1	0.1	0.0
Average	13.2	13.4	2.0	-0.5	0.3	2.7

Sources of primary data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, June). World Development Index; World Bank. (2016, April). World Governance Indicators

Fig.2- 1 – Total natural resource rents, total tax, and political stability

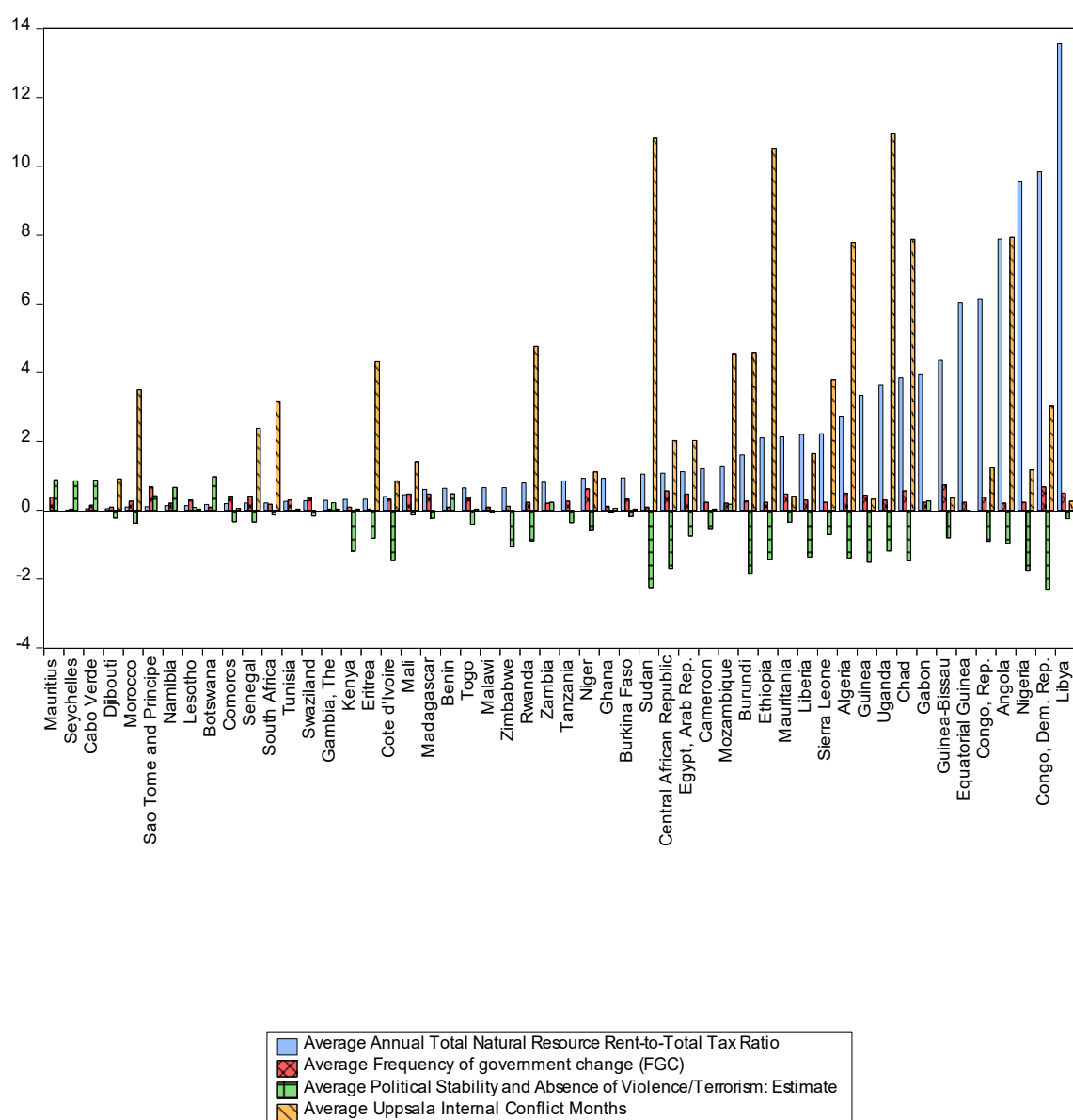


Figure created with Eviews 9.5

Fig.2- 1 shows the relationship between the total natural resource rents-to-total tax (NRT) ratio and political stability. As the NRT ratio – the gap between the total natural resource rent and total tax – increases, the level of political stability declines in most of the countries. Moreover, the duration of conflict¹ in conflict-affected states is longer, the larger the NRT ratio. The frequency of government change, however, appears to be unaffected by the NRT ratio.

¹ The duration of conflict here is measured by Type 3 (“internal armed conflict occurring between the government of a state and one or more internal opposition group(s) without intervention from other states”) and Type 4 (“internationalized internal armed conflict occurring between the government of a state and one or more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides”) conflicts in the

2.4 Empirical analysis

2.4.1 Data

The research shall analyse data from a panel of 52 countries in Africa for the period 1996 to 2013. The data were sourced from the World Development Indicators and the World Governance Indicators datasets by the World Bank, and the International Centre for Tax and Development (ICTD) Government Revenue Dataset.² Due to insufficient data for Somalia and South Sudan, the two countries are excluded from the analysis.

The analysis uses, as a measure of political stability, the Political Stability and Absence of Violence/Terrorism estimate in the World Governance Index of the World Bank. The analysis using this dataset for political stability runs from 1996 to 2013, although data is unavailable for the years 1997, 1999 and 2001.

Various other variables are considered as determinants of political instability in this study. One of such is the level of per capita GDP. Since incidences of political instability, particularly of a violent nature, entail an opportunity cost to the citizens, the higher the level of income per capita would mean a higher cost to the individual of engaging in subversive activities. The cost of insurgency arises by way of destroyed assets and/or the loss of earnings that would have accrued had there been no insurgency. Consequently, the richer the individual is, the greater would be the cost of insurgency and, therefore, the lower his propensity to engage in it (Parvin, 1973; Collier & Hoeffler, 2011).

A greater degree of urbanization would connote a greater exposure to modernity and the desirable economic benefits that accompany it, which would reduce the propensity for social unrest. Previous studies, including Parvin (1973), Blanco and Grier (2009) and Armah and Amoah (2010), have found urbanization to be significantly related to political stability.

The current account balance, a component of the balance of payments, is one of the variables included in the model. The performance of the external sector including the debt burden, and in particular, the debt-servicing requirements reflects the amount of resources available to the government in providing social overheads. Negative external balances would thus reflect not only weaker trade performances, but also a greater flow of public resources out of the domestic economy for the servicing of debt to the detriment of the provision of public goods. A decline in the provision of public services may endanger political stability.

UCDP/PRIO Armed Conflict Dataset, Version 4-2015 of Uppsala University, Sweden (Themnér, 2015). Since the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 is presented in days, an **internal conflict month** is defined here as a Type 3 and/or Type 4 conflict in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 that occurs within a period ranging from one day to one calendar month. External conflict is not considered here because its impact on the domestic economy may not be certain.

² There are no cyclically adjusted data in the database. The original data is thus made use of.

Collier and Hoeffler's (2011) study on the economic causes of war, found that natural-(primary-) resource dependence initially increased the duration and risk of civil war but thereafter reduced it (an inverted U-shaped relationship). They argued that rent-seeking in primary-product dependent economies provided motivation to rebels to seek to takeover power. The presence of primary resource thus simultaneously provided rebels with the incentive to execute the war, with the hope of appropriating those resources in the event of victory, and provided the government with the financial resources required to execute the war. Parvin (1973), while discussing the impact of urbanization on political stability, had argued that practically all violent revolutions and unrest since World War II had taken place in predominantly agricultural countries.

2.4.2 Econometric model

The dynamic econometric model to be estimated using the system generalized method of moments (SGMM) is:

$$PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{TotNatResRent}{TotTax} \right)_{it} + \gamma_3 GDPpc_{it} + \gamma_4 Urban_{it} + \gamma_5 CAB_{it} + \varepsilon_{it} \quad (2)$$

for $i = 1, \dots, N$, $t = 1, \dots, T$, where PS_{it} is political instability for country i in the year t .

For the government revenue sources (**R**) for the respective countries i in year t , $\left(\frac{TotNatResRent}{TotTax} \right)_{it}$ is the ratio of total natural resource rents-to-total tax. It is expected that the higher the ratio is, the greater the level of political instability. Also, for the level of economic activity (**E**), $GDPpc_{it}$ is the Gross Domestic Product per capita. It is expected that a higher Gross Domestic Product per capita will lower political instability. For socio-demographic variable (**D**), $Urban_{it}$ is for urbanization, while CAB_{it} is the external sector (**Ext**) variable. α_i is the country-specific effect that captures the characteristics that are unchanged over time. The parameters to be estimated are $\gamma_1, \gamma_2, \dots, \gamma_5$, and ε_{it} is an i.i.d error term.³

³ Preceding the system GMM regression analysis, the covariance stationarity of the series is ascertained through the panel unit root test, the results of which are shown in the Appendices as Appendix 2-F. For most of the series, the null hypothesis H_0 of non-stationarity can be rejected at the 5% level of significance, both at level and at first difference. However, H_0 is not rejected for PS , $\frac{TotNatResRent}{TotTax}$, $GDPpc$, and $Urban$ at level and at first difference for $Urban$ using Breitung t-statistic. H_0 is also not rejected for $GDPpc$ using the Im, Pesaran and Shin W-statistic, Augmented Dickey-Fuller (ADF) - Fisher Chi-square, and Phillips-Perron (PP) - Fisher Chi-square at level but it is rejected at first difference for these tests, as well as, at both level and first difference for Levin, Lin & Chu t test. H_0 is not rejected for $Urban$ at first difference using the Im, Pesaran and Shin W-statistic.

Using data from the panel of 52 African countries, the System General Method of Moments was used to test the relationships. A one-year lag of the dependent variable (political stability) is used as an explanatory variable, with a maximum of one lag of the dependent variable used as an instrument. The ratio of total natural resource rents-to-total tax (NRT) and GDP per capita are treated as endogenous variables in the model (since the levels of both rents and tax may influence and may be influenced by the level of political instability), all without lags but with one lag used as an instrument.

2.4.3 Empirical Results

Using the Political Stability and Absence of Violence/Terrorism estimate in the World Governance Index of the World Bank to define political stability, the results of the two-step (robust standard errors) system generalized method of moments analysis, as presented in equation 2, are shown in Table 2-2.

Table 2-2 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.836*** (0.045)	0.791*** (0.041)	0.801*** (0.043)	0.790*** (0.042)
TotNatResRent/TotTax	-0.00629* (0.003)	-0.0111** (0.004)	-0.0104* (0.004)	-0.0111* (0.005)
GDP per capita (constant 2005 US\$)		0.0000285** (0.000)	0.0000281** (0.000)	0.0000263* (0.000)
Urban population (% of total)			-0.00114 (0.002)	0.00171 (0.002)
Current account balance (% of GDP)				-0.000208 (0.002)
Constant	-0.0469 (0.026)	-0.110* (0.044)	-0.0567 (0.090)	-0.184* (0.082)
No. of observations	499	499	499	460
No. of countries	51	51	51	51
No. of instruments	42	63	64	85
Hansen (p-value)	0.3009	0.8334	0.8762	0.9992
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.8036	0.7351	0.7441	0.8269
AR3 (p-value)	0.8979	0.9183	0.9116	0.9317
Wald chi2	403.61	1023.84	824.45	537.03
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results in Table 2-2 shows a direct relationship between political stability in the preceding period and political stability in the current period. This shows that political (in)stability is self-reinforcing.

For the ratio of total natural resource rent-to-total tax (NRT), the columns *R*, *R,E*, and *R,E,D* show a significant inverse relationship with political stability. Hence, as the gap between total natural resource rent and total tax increases, the level of political stability declines. Consequently, reductions in taxation, arising from increases in the rents derived from natural resource exploitation, are detrimental to the stability of the political system.⁴

Similarly, columns *R,E* and *R,E,D* show that there is a direct relationship between the level of GDP per capita and the level of political stability. This supports previous research findings that high levels of per capita GDP reduced the risk of political unrest. Given the very small values of the estimated parameters, however, the relationship between the GDP per capita and political stability, although statistically significant, is economically not significant. For the level of urbanization, it is shown in column *R,E,D* to have a statistically nonsignificant relationship with political stability.

The results remain largely the same when the external sector variable, the current account balance, is included in column *R,E,D,Ext*. The current account balance, however, is shown to not have a significant relationship with the level of political stability.⁵

The results of the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991) for the respective columns are statistically nonsignificant. Hence, they satisfy the hypothesis that the instruments are valid instruments – that is, the instruments are uncorrelated with the error term – and the excluded instruments are correctly excluded from the estimated equation. The significant Wald Chi-squared test results indicate that the explanatory variables in the model are significant and cannot be removed from the model without affecting the model.

As expected, the results of the autoregressive (AR) processes are statistically significant for the first lag (that is, AR(1)), while they are nonsignificant for the second (AR(2)) and third (AR(3)) lags. Since the first lag of the dependent variable, political stability, is used as an explanatory variable in the SGMM regression, first-order serial correlation is expected. However, for the second lag onwards, there should be no autocorrelation as has been found.

One-year lags of all the endogenous variables, namely, the NRT ratio, the GDP per capita and the current account balance, were also included in the analysis. Modifying equation 2, we have

⁴ Inverting the NRT ratio such that we have the total tax-to-total natural resource rent (TNR) ratio, the analysis found the TNR ratio to be significantly directly related to the level of political stability. Hence, raising total tax relative to the total natural resource rent would lower the level of political instability. The results are shown in Appendix 2-A1

⁵ Using a variant of the econometric model that analyses the natural resource rent and total tax separately, that is, $PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 NatRes_{it} + \gamma_3 TotTax_{it} + \gamma_4 GDPpc_{it} + \gamma_5 Urban_{it} + \gamma_6 CAB_{it} + \varepsilon_{it}$, the analysis found a significant inverse relationship between total natural resource rents and political stability and direct, but statistically nonsignificant, relationship for total tax. The results are shown in Appendix 2-A2.

$$PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{TotNatResRent}{TotTax} \right)_{it} + \gamma_3 \left(\frac{TotNatResRent}{TotTax} \right)_{it-1} + \gamma_4 GDPpc_{it} + \gamma_5 GDPpc_{it-1} + \gamma_6 Urban_{it} + \gamma_7 CAB_{it} + \gamma_8 CAB_{it-1} + \varepsilon_{it} \quad (3)$$

The results found are largely similar to those found in the previous analysis. For the main variable of interest – the NRT ratio, however, both its current value and its one-year lag have a significant inverse relationship with the level of political stability, implying a higher NRT ratio in the preceding year, as well as, the current year raised the level of political instability. The results further show that the NRT ratio in the current year has a greater depressing influence on the level of political stability than its one-year lag does. For the other variables, only the current level of the GDP per capita is shown to have a direct relationship with the level of political stability, while neither the current value nor the lag of the current account balance had a significant influence on the level of political stability. The results of this analysis are shown in Table 2-3.

Table 2-3 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent/total tax (endogenous; lagstruct(1,1)), GDP per capita (endogenous; lagstruct(1,1)), urbanization, and current account balance (endogenous; lagstruct(1,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.869***	0.739***	0.717***	0.734***
	(0.067)	(0.044)	(0.038)	(0.043)
TotNatResRent/TotTax	-0.00448	-0.00934*	-0.0107*	-0.0141**
	(0.010)	(0.004)	(0.005)	(0.005)
L.TotNatResRent/TotTax	0.00434	-0.00680*	-0.00798*	-0.00935***
	(0.012)	(0.003)	(0.004)	(0.003)
GDP per capita (constant 2005 US\$)		0.000112*	0.000120*	0.000130**
		(0.000)	(0.000)	(0.000)
L.GDP per capita (constant 2005 US\$)		-0.0000706	-0.0000786	-0.0000868
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			0.00247	0.00359
			(0.002)	(0.002)
Current account balance (% of GDP)				0.000673
				(0.003)
L.Current account balance (% of GDP)				0.00313
				(0.004)
Constant	-0.0431	-0.152***	-0.254*	-0.274*
	(0.035)	(0.038)	(0.109)	(0.127)
No. of observations	497	497	497	458
No. of countries	51	51	51	51
No. of instruments	42	63	64	85
Hansen (p-value)	0.2918	0.7915	0.8819	0.9992
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.8453	0.8369	0.8324	0.9922
AR3 (p-value)	0.8345	0.9391	0.9694	0.8505
Wald chi2	172.75	518.17	1070.06	1314.03
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.4.4 Robustness check

To check for the robustness of the results, the countries were grouped according to their long-term average levels of the NRT ratio, the average long-term growth rates of the natural resource rents, as well as, the ratio of the respective types of natural resource (namely, coal, forest, mineral, natural gas, and oil) rents to the total tax. The relationships remained largely similar to the previous findings for long-term average levels of the NRT ratio, that being that the greater the difference between the total natural resource rents and total tax, the lower the level of political stability. The results are shown in Appendix 2-B. The same is true for the ratios of the respective types of natural resource rents-to-total tax, of which all, except forest rents, respectively show a significant inverse relationship with political stability. The results are shown in Appendix 2-C1 – Appendix 2-C5. Appendix 2-C6 aggregates the ratios of the respective types of natural resource rents-to-total tax into a single econometric model. Although the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991) showed a p-value of unity (1.0000) (this is due to the large number of instruments that came about as a result of the greater number of endogenous variables included in the model), which according to Roodman (2009:98) is ‘implausibly good’, it is instructive to note that the ratios of only two types of natural resource rents-to-total tax, namely, mineral rents (in columns **R** and **R,E**) and oil rents (in columns **R,E**, **R,E,D** and **R,E,D,Ext**), show a significant inverse relationship with the level of political stability.

Furthermore, two-way system GMM regression analysis was conducted, modifying equation 2 to get:

$$PS_{it} = \alpha_i + \beta_t + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{TotNatResRent}{TotTax} \right)_{it} + \gamma_3 GDPpc_{it} + \gamma_4 Urban_{it} + \gamma_5 CAB_{it} + \varepsilon_{it} \quad (4)$$

where β_t is a set of year dummies that captures common business conditions across the countries. The results, shown in Appendix 2-D, indicate a significant inverse relationship between the NRT ratio and political stability in column **R**. In addition, two-way pooled OLS, fixed-effects and random-effects regression analyses were also conducted and the results are shown in Appendix 2-E. Statistically significant results for the Breusch-Pagan Lagrangian multiplier test for random effects and the Hausman test indicate that the most appropriate analytical method is the fixed-effects regression. The results of the two-way fixed effects regression analysis show an inverse, although statistically nonsignificant, relationship between the NRT ratio and political stability.

2.5 Conclusion

This paper researched into the relationship between natural resource rents, taxation and political instability. The findings of the research show that the presence of natural resource rents inversely

impacts on tax morale and hence tax collection, as citizens become less keen on paying taxes to fund the provision of the public good. Moreover, the incumbent government, while seeking to maintain its hold on power to maximize the benefits derivable from the rents, embarks on patronage spending and tax cuts. All of these actions reduce the total tax collection.

The empirical analysis found that the wider the gap between total natural resource rents and total tax, the greater the level of political instability. This result was found to be true irrespective of the level of the long-term average NRT ratio, the growth rate of the total natural resource rents, or the type of natural resource rent. In any of these cases, reduction in total tax relative to the natural resource rent raised the level of political instability as other political actors tussle for power in order to gain access to the rents.

While receiving the highest possible amount of natural resource rents would be desirable to an incumbent, the value of the rents received is often outside the control of the incumbent, but taxes are. To lower the level of political instability, then, the incumbent must maintain an appreciably high level of taxation in order to engender a higher level of political participation by the citizenry. To achieve this, the structures of state would have to be maintained at both the centre and the peripheries of the country. These would allow for channels of communication between the government and the citizenry and ensure that expectations and/or grievances are effectively communicated to the government by the citizenry. Moreover, these structures would allow for greater accountability by the incumbent government to the citizenry and thus diminish the conditions for political instability.

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CHAPTER THREE

TAX STRUCTURE AND POLITICAL INSTABILITY IN AFRICA

Abstract

Using data from 52 African countries for the period 1980 to 2013, this chapter analysed the relationship between the tax structure and political instability. The chapter proposed that higher direct taxation relative to indirect taxation generated a greater feeling of loss in the taxpayer and hence created conditions for greater political instability. The larger per transaction payments of direct taxes and their relatively simplified structures raise the perceived cost of government services and, therefore, have greater potential in generating disaffection in the taxpayer than indirect taxes, which are smaller per transaction payments and are much more complex, and, therefore, less discernible. The research found that higher long-term average direct tax-to-indirect tax ratios (**DITR**), as well as, wider fluctuations in the successive values of the direct tax when combined with higher long-term average **DITR**, resulted in a direct relationship between the **DITR** and political instability. The same relationship was also found when the fluctuations in direct tax were wider than the fluctuations in indirect tax, and these fluctuations in the direct tax were very wide, irrespective of the value of the long-term average **DITR**.

Keywords: Taxation; tax structure; political instability

JEL Classification Numbers: D74, H20, H21, H24, H25, H26

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3.1 Introduction

Political instability is often linked to higher government spending and consequently higher taxation and/or higher debt levels when tax revenues fall short of the required expenditure. The higher taxation is a consequence of both the greater levels of political instability and the need to liquidate accumulated debt while sustaining the provision of social services. The raising of taxes may, however, in a circular manner, cause disaffection among the taxpayers, as has been seen expressed in incidences of riots and protests, as well as, strikes against the imposition or increase of taxes, such as the cases in Ethiopia in February 2005, in Burkina Faso between February and April 2010, and in the Democratic Republic of Congo in July and December of 2014, and in November of 2015. In other cases, such as that of Tunisia in February 2015, it is noted that the imposition of tax served as a catalyst for the expression of discontent regarding existing economic conditions, such as unemployment, and general dissatisfaction with governance (Raleigh, Dowd, & Moody, 2015).

The literature on the relationship between taxation and political instability indicates quite varied outcomes. Most have focused on the relationship while considering either only one type of tax or taxation as a whole. The influence of political instability on capital taxation has been considered by Devereux and Wen (1998), and on seigniorage, the “inflation” tax, by Cukierman et al. (1992). Either case considers a unidirectional influence of political instability on a single type of tax. A bidirectional study of the political instability-tax relationship is that of Estrada et al. (2011), who did not find a significant causal influence in either direction. This case, however, considered taxation as a whole.

Taxation, however, consists of a mix of various types of tax subsisting together. The literature on the tax structure has dealt extensively with achieving some optimality conditions in taxation, including Diamond and Mirrlees (1971), and Atkinson and Stiglitz (1976); on its use in income redistribution, including Atkinson and Stiglitz (1980), and Sung and Park (2011); or its influence on economic growth, including Lee and Gordon (2005), and Arnold et al. (2011). A couple of other literature, including Volkerink and de Haan (1999), have considered how political and institutional factors determine the tax mix.

Classified into the two broad tax groups, that is, direct taxes and indirect taxes, direct taxes (such as income tax), unlike indirect taxes (such as sales or consumption tax), tend to be collected at longer intervals. To the contrary, indirect taxes, such as sales or consumption tax, tend to be more regular payments, as the duration between successive tax payments is considerably shorter than is the case with the income tax, for example. Furthermore, and likely due to the frequency of payment, the per transaction payment of direct taxes also tends to be larger than the per transaction payment of indirect taxes. Hence, in the payment of income taxes, which often occurs monthly, the taxpayer tends to make a larger payment as opposed to the payment of say, the consumption tax, where the taxpayer makes smaller payments as additions to the cost of regular consumption purchases. In addition,

Wagner's (1976) exposition of the theory of fiscal illusion posits that the complexity of the tax structure affects the taxpayer's perception of the cost of government. As a result, greater complexity of a tax, arising from the multiplicity of its extraction points, creates an illusion that the cost of government is lower since the cost of inquiring into the full realm of its extraction becomes higher and the taxpayer is consequently unaware of the full burden of the tax. Hence, more complex taxes, such as the value-added tax, an indirect tax, make the cost of government output appear to be cheaper when compared to the income tax, a direct tax, which has a single extraction point. Wagner (1976) added that citizens would make a less total effort to avoid taxation if the extractions are taken from more than one base than if the entire amount is extracted from a single base. Wagner (1976) thus concluded that the reaction of citizens, including their political reactions, would depend on the form in which the bill of government is presented.⁶

By paying a larger sum of money at a given time, and given the differing perceptions generated by different types of tax, this paper, following Hettich and Winer's (1988) description of taxation as a "loss" in income, argues that the taxpayer feels a greater sense of "loss" per transaction when paying direct taxes than they would when paying indirect taxes. It is therefore argued further that the greater the feeling of loss, resulting from the payment of direct taxes, the greater the public desire for accountability and hence greater agitation against governments that are perceived to be unaccountable. To the contrary, since indirect taxes do not carry with them such a degree of a feeling of loss as direct taxes do, they are less likely to generate as much public disaffection as direct taxes do. The objective of this paper shall thus be to measure the influence of the tax structure on political instability. In particular, this paper shall consider how changes in direct tax relative to indirect tax influence political instability. The maintenance of a stable and predictable political environment with strong and stable institutions, where the tenure of government is secure and the government is able to execute its policies and programmes, as well as, maintain the rule of law and order, is critical to the achievement of any desired optimal outcomes. Given the payment schedules of direct and indirect taxes and their potential in generating differing perceptions of loss and consequently create conditions of political instability, this study investigates the influence of the tax structure on political instability.

The paper is divided into five sections, the first of which is the introduction. This is followed by a discussion on the tax structure where the theoretical basis for the tax structure and its real-world application is reviewed. The discussion on the tax structure and political instability considers how variations in direct and indirect taxes influence the level of political instability. Thereafter, using data from 52 African countries, an empirical analysis of the influence of the tax structure on political instability is carried out. The paper concludes with a section on summary and conclusion.

⁶ Tanzi and Davoodi (2000) found that corruption had a greater depressing effect on direct taxes than on indirect taxes. The relative simplicity of direct taxes, as posited by Wagner (1976), may account for that.

3.2 On the tax structure

The term “tax structure”, according to Hettich and Winer (1984), covers two aspects of the fiscal system. First, it describes the composition of public revenue with regard to the different tax sources. In addition, the tax structure also refers to the structural features of particular taxes, such as the definition of the bases, the extent and nature of deductions and exemptions, and the schedules of tax rates. This paper focuses on the composition of public revenue divided broadly into direct and indirect taxes.

The distinction between direct and indirect taxes, as noted by Sanford (2000) is strictly an administrative one, indicated by whether the taxpayer is directly assessed for tax or through some third party. Due and Friedlaender (1973) had earlier argued that the distinction between direct and indirect taxes rested on the ease with which the tax was shifted from the taxpayer to a third party, the consumer. A further distinction was made by Atkinson and Stiglitz (1980) who stated that “direct taxes may be adjusted to the individual characteristics of the taxpayer, whereas indirect taxes are levied on transactions irrespective of the circumstance of buyer and seller.” Still, another distinction was made by Sanford (2000), stating that income and capital expenditure taxation are usually considered as direct while taxes on expenditure are considered to be indirect.

The body of literature on the optimal tax seeks to recommend what the efficient and non-distortionary tax should be. Diamond and Mirrlees (1971) posited that lump-sum taxes are the first-best allocation because they are non-distortionary. However, lump-sum taxes do not take into cognisance the heterogeneity that exists among taxpayers with regard to their earning abilities, which results from the differences in their skills. Moreover, since these differences are private information, income could be more easily applied as a screening device. Taxes on labour, however, are distortionary as they affect the supply of labour and hence productivity, and should, therefore, be smoothed (or spread evenly) over time, while there should be no taxes on capital. Atkinson and Stiglitz (1976), stated that if the government had no distributional objective and was concerned solely with efficiency, it may employ direct taxation, particularly, a poll tax. Where the utility function is separable between labour and all commodities, if the government may choose a general income tax function, they (Atkinson & Stiglitz, 1976) argued that no indirect tax needed to be employed. In this case, the use of consumption of particular commodities as a screening device offers no benefit. However, unlike Atkinson and Stiglitz (1976), by considering more than one dimension of unobservable heterogeneity, Cremer et al. (2001) showed that differential commodity taxes do have a role to play as instruments of optimal tax policy and hence an optimal (general) income tax will not suffice.

Since direct taxes could be adjusted to the individual characteristics of the taxpayer, as Atkinson and Stiglitz (1980) noted, direct taxes rather than indirect taxes have been preferred in effecting income redistribution. This is the case partly because direct taxes, particularly income tax, could be made to be

progressive, thus taxing higher income groups more heavily to provide public services used by all income groups or provide other benefits to the lower income groups. Sung and Park (2011), studying the effects of taxes and benefits on income distribution in Korea, found that direct taxes were a more effective tool for income redistribution as compared to consumption taxes, which had a small and negative influence on income redistribution. When the policy objective of the government favours income redistribution, direct taxation has thus been applied as the preferred device.

On the relationship between the tax structure (or the tax mix) and the level of economic growth, Arnold et al. (2011) while studying the impact of the tax structure on economic growth in 21 OECD countries from 1971 to 2004, concluded that economic growth can be improved when government leans more towards consumption and immovable property taxes. Additionally, they stated that the reduction in income tax for low-income earners showed the most promise in terms of both increased growth and economic recovery. Lee and Gordon (2005), on the other hand, found that a reduction in the corporate tax rate led to higher future growth rates.

Musgrave (1969) argued that as a country reaches higher levels of per capita income, much greater importance is assigned to the individual income tax and other direct taxes, such as the corporate profits tax. According to Sanford (2000), developing countries rely for revenue more heavily on indirect taxes than the developed countries do. In particular, most developing countries receive a large proportion of central government revenue from indirect taxes, of which, international trade taxes were a more important source of indirect tax than were general sales taxes. Borg (2006) also found an inverse relationship between the proportion of trade tax to total tax revenue and the level of development in small countries. Sanford (2000) added that developing countries, unlike industrial countries, obtain a smaller proportion of revenue from direct taxes, of which, corporate income tax contributes a greater proportion. In industrial countries, the proportion of revenue from personal tax predominates. Globally, developing countries of Africa rely the most on indirect taxes, of which the highest reliance is on international trade taxes. The Western Hemisphere comes second in both of these.

Sanford (2000) gave reasons for the differences in the tax structure between industrial and developing countries. First, income tax requires a greater degree of sophistication in its administration than indirect tax does. Because developing countries lack reliable database, and partly due to widespread illiteracy and, more importantly, because of poverty, they cannot operate an extensive income tax. Sanford (2000) thus concluded that the poorer the country, the less reliance on income tax and social security contributions and the more likely it is that the bulk of such income tax revenue comes from corporations. Secondly, Sanford (2000) stated that it is easier to administer excise duties and trade taxes than income taxes mainly because there are few collection points, which are primarily located at ports. Moreover, since excises often have a physical rather than an accounting base, they are much easier for an unsophisticated tax administration to cope with because it promotes certainty in taxation.

Besides, according to Sanford (2000), taxes on international trade are used as a device to protect local industry and the multiple excise duties in some developing countries may result from an attempt to acquire revenue from all possible sources. The tax structure is thus further shaped by the level of development of the economy.

3.3 Tax structure and political instability

Consideration of the optimality conditions proposed by Atkinson and Stiglitz (1976) and Cremer et al. (2001), among others, and the influence of the tax structure on economic growth alone do not suffice in the design of a tax structure. Volkerink and de Haan (1999), studying the political and institutional determinants of the tax mix, stated that the considerations from the optimal taxation theory are likely to be not the only considerations in developing a tax structure. Political and institutional factors do influence it.

The discussion on tax structure and political instability proceeds from two contrary directions, the first being political instability determining the tax structure, and the second being tax structure causing political instability. From the political instability determining the tax structure perspective, Devereux and Wen (1998) set out a model where greater political instability led to greater capital taxation. The model, similar to Persson and Svensson's (1989) and Alesina and Tabellini's (1990) models, posits a situation where two types of governments can possibly be in power at any given time period. In the absence of political instability, the government in power expects to remain in power forever and therefore imposes a tax on initial holders of capital sufficient to maintain a constant stock of negative government debt-to-GDP ratio, and never imposes a tax on capital in the future. But when there is political uncertainty, the government imposes a lower initial capital tax and taxes capital at a constant positive rate at all periods in the future, while embarking on higher government spending relative to an economy with the certainty of government tenure. Should the opposition party win office, it would then have to impose a tax on capital, which would reduce the incentive to invest and thus lower the economic growth rate relative to what it would have been without the taxation of capital. The opposition's potential to spend is thus reduced. Consequently, the share of government in GDP is higher with political instability.

Cukierman et al. (1992) had similarly argued that strategic political considerations had a role to play in the design of the tax system. The existing tax system at any point in time, according to Cukierman et al. (1992), acts as a constraint on the fiscal policy of the current government, which suggests that tax reforms are also determined by strategic considerations, taking into account how it will constrain the fiscal policies of future governments. Hence, greater political instability and political polarization induced the current government to leave an inefficient tax system to its successors.

Cukierman et al. (1992) thus concluded that as a consequence, politically unstable and politically polarized countries will have more inefficient tax structures and, will thus rely more heavily on seigniorage (the inflation tax), which, according to Aizenman and Jinjara (2008), costs the government nothing to collect. Nkurunziza (2005) found that political instability in Burundi led to an initial increase in the inflation tax. However, the inflation tax subsequently declined due to asset substitution as the state of political instability persisted. Other empirical studies on the relationship between taxation and political instability include Aizenman and Jinjara (2008) who, while studying a panel of 44 countries for the period 1970 to 1999, found that the greater the durability of a political regime and the ease and fluidity of political participation, the greater the efficiency in VAT collection.

From the contrary point of causality, that is, taxation leading to political instability, Hettich and Winer (1988) developed a model in which the support for the government is influenced positively by the services received from pure public goods and negatively by the loss in income (including deadweight loss) from taxation. Voters, according to this model, base their decision on whether to support the government on how they are affected by benefits and taxes and are not influenced by how others are treated. The model, thus, derived the essential elements of tax systems as the outcome of rational behaviour where government maximizes expected support and where opposition to taxation depends on the loss of full income. Politicians, being mindful of the risk of the government falling when there is a loss of support, are thus seen to minimize the political costs of different kinds of taxation, given a certain level of revenue (Volkerink & de Haan, 1999).

In Wagner's (1976) exposition of the theory of fiscal illusion, he asserts different perceptions generated with regard to the price (or cost) of government arising from the methods and complexities of taxation. Wagner (1976) noted that the extraction of the income tax through withholding by the employer would seem less costly to the taxpayer than would direct payments by the taxpayer of the same tax made after the taxpayer has received the gross income. Although the amount extracted as tax through either method may be identical, Wagner (1976), citing Van Wagstaff (1965), stated that there was no basis for insisting that the taxpayer would have an identical hypothesis concerning the price of public output. With regard to the complexity of the revenue structure, Wagner (1976) asserted that greater complexity raises the cost of inquiring into the material realm in which fiscal extraction devices make their extraction. The resulting reduction in exploration undertaken, Wagner (1976) adds, means that the accuracy of the taxpayer's perception of the price of public output will lessen. Consequently, the cost of government will appear lower to the taxpayer when the value-added tax, which is characterized by multi-staged tax payments over a period, rather than the general sales tax, is applied, as would a general sales or consumption tax in comparison to the income tax, which is much more simplified. Thus, the accuracy of an individual's perception of the cost of government would vary inversely with the complexity of the revenue structure. Therefore, in line with Hettich and Winer's (1988) characterization of taxation, the complexity of a given tax influences the taxpayer's perception

of loss in relation to the tax in question. This would, in turn, influence the taxpayer's political reaction to the tax.

3.3.1 A proposition

Decomposing into the two broad tax revenue sources, assuming a total tax schedule for an individual that incorporates the total tax payments for different types of tax paid by the individual within a period of time, say, annually. Let t^d represent the direct tax rate levied on the total annual income Y of the individual, such that, $t^d Y$ is the total annual direct tax payment. Similarly representing the indirect tax rate levied on the total consumption expenditure C of the individual by t^i gives the total annual consumption tax payment as $t^i C$. Assuming there are no savings and the total income is consumed, the individual's total annual tax payment is, therefore,

$$T = t^d Y + t^i C \quad (1)$$

If we assume that the individual is non-altruistic and would seek purely his personal interest even at the cost of other members of the society, and would, therefore, seek to be a free rider where the opportunities avail, then he would consider the payment of tax as a loss of his consumption of private goods. Defining the total annual loss from the payment of tax as L^T , and defining the total annual loss from the payment of direct and indirect taxes as being, respectively, equal to the total annual value paid as either tax, represented, respectively, as $L^{t^d Y}$ and $L^{t^i C}$, then

$$L^T = L^{t^d Y} + L^{t^i C} \quad (2)$$

Now, tax payments are made at different intervals within the year. Representing the frequency of the payment of direct and indirect taxes respectively by f , then for annualized tax payment schedules, the per transaction (or, momentary) loss from the payment of the taxes is

$$\frac{L^T}{f} = \frac{L^{t^d Y}}{f} + \frac{L^{t^i C}}{f} \quad (3)$$

In the real-world, the frequency of payment of direct taxes is not equal to that of indirect taxes. Given the higher frequency of the payment of the indirect tax such that its denominator tends to infinity, the per transaction loss from the payment of the indirect tax tends towards zero. On the other hand, the lower frequency of the payment of the direct tax implies that its denominator tends to zero and hence the per transaction loss from the payment of the direct tax tends towards infinity. In addition, an expression showing the greater complexity of an indirect tax, with more extraction points, relative to a direct tax, as Wagner (1976) argued, may be similarly constructed. Consequently, the per transaction loss from the total payments of tax is overwhelmingly determined by the per transaction loss from the

payment of the direct tax. It should be noted that the loss from the payment of the income tax, for example, can then only be mitigated by underreporting or non-reporting of income, Y . Similarly, the loss from the payment of the consumption or sales tax can be mitigated further by reducing the level of consumption, C .

Now, following the preceding discussion and taking a ratio of the loss from the payment of the income (direct) tax to the loss from the payment of the consumption (indirect) tax to construct what may be referred to as the *perception of relative loss ratio*⁷ resulting from the payment of either taxes yields

$$\text{Perception of Relative Loss ratio} = \frac{L^{t^d_Y}/f}{L^{t^c_C}/f} \cong \frac{DT}{IT} \quad (4)$$

where DT and IT are direct tax and indirect tax, respectively.

Given the frequencies of the payment of direct and indirect taxes, as well as their complexities, the numerator (DT , divided by its frequency of payment, which tends toward zero) tends toward infinity when the denominator (IT , divided by its frequency of payment, which tends toward infinity) tends to zero. Hence, increasing direct tax relative to indirect tax accentuates the loss from the payment of tax. Indirect tax, which is the denominator, is taken as numeraire against which direct tax is altered.

The preceding proposition relies on the following implications of the expression. The first is that the individual considers only one tax transaction at a time of either type of tax from among the set of all tax transactions, rather than the total value of all tax transactions of either tax types. This is because the individual is unable to or fails to sum up all tax transactions over a period, but considers only the tax paid per transaction. This is especially the case for indirect taxes where the frequency of transactions is significantly higher and, therefore, significantly more difficult to aggregate. Moreover, unlike the income tax where the individual, having knowledge of what his total income and the applicable tax rates for the period would be, can more easily estimate with significant accuracy what his income tax obligation for the period would be ex-ante, the individual is unable to estimate with the same degree of ease and accuracy, as for the income tax, what his indirect tax obligation would be ex-ante. This is true, unless, of course, he realizes ex-ante that of his disposable income (after the income tax is paid) a certain percentage would inevitably be paid as tax, assuming there is a unique consumption tax rate for all consumption items and there are no savings or transfers. The individual who fails to realize ex-ante what his indirect tax obligation would be would then have to rely on the more cumbersome ex-post tax computation. As a consequence of this inability or failure to aggregate the total tax payments for the period, determining political instability as a function of the ratio of either tax to the aggregate of both

⁷ The author is grateful to Professor Masayuki Tamaoka for the insightful questions and contributions that led to the formation of this expression.

taxes, that is, for example $\frac{\text{Direct Tax}}{\text{Direct Tax} + \text{Indirect Tax}}$, would be inappropriate. This measure of tax proportions unavoidably requires the ability of the taxpayer to accurately estimate his total tax obligation ex-ante or compute all tax payments ex-post.⁸ Hence, the taxpayer only considers the loss from his last payment of the direct tax in relation to only the last payment of the indirect tax and not the total sums of either taxes paid.

Another implication of the expression is that since the indirect tax is the more frequently paid tax, the taxpayer uses it as the basis for assessing his direct tax obligation. Given the tax payment schedule such that the per transaction payment of the indirect tax is infinitesimally small, any comparison of the direct tax against the indirect tax significantly increases the perceived loss from the payment of the direct tax.

Also, the approximation of the *perception of relative loss ratio* to the direct tax-to-indirect tax ratio (**DITR**) assumes, for simplicity sake, that the same pool of taxpayers pays both the direct tax and indirect tax. After all, the total incidence of tax falls on the total income of all taxpayers who account for the total productivity of the economy, assuming there is no government production.

The preceding argument can be stated more simply as follows. Assuming a proportional income tax rate and consumption tax rate are both equal to 10%. Assuming also that the taxpayer has an income of \$10,000, and he/she makes no transfers and makes no savings. Personal Income Tax (PIT) would then reduce the income by \$1,000, leaving \$9,000 as disposable income. If the individual consumes the value of the remaining income, the total consumption tax would amount to \$900 (which is less than \$1,000, the value of the PIT). Consequently, were the individual to make a single purchase that equals the total value of the disposable income (that is, the income remaining after the income tax has been deducted), the consumption tax paid for this single purchase would always be less than the income tax paid. In this case, therefore, a consumption tax cannot exceed an income tax.

Furthermore, since consumption tax is usually paid by the individual at multiple points in time when making consumption expenditures, the per transaction tax payment of the consumption tax would always be less than that of PIT. Hence, were the individual to split consumption expenditures into equal parts, say, 2, 3, 4, ... splits such that the consumption tax paid per transaction is $\$900/2 = \450 , $\$900/3 = \300 , $\$900/4 = \225 , and so on, the per transaction payment of the consumption tax becomes even smaller. Hence, for higher instances of consumption expenditure, the consumption tax paid per

⁸ In determining the influence of the tax structure on political instability, the computation of the tax obligation ex-ante or tax payments ex-post raises an important question. Following Hettich and Winer's (1988) description of taxation as a "loss" in income, and the argument presented concerning the ability or otherwise of the individual to compute the tax ex-ante or ex-post, it is pertinent, then, to question whether the loss is felt by the individual prior to the payment (ex-ante), at the point of payment, or after the payment (ex-post). If, for example, the individual could accurately estimate his tax obligations ex-ante, would the individual then feel a loss of yet-to-be-made tax payments from possibly yet-to-be-earned income, as opposed to the point of payment or after the payment has been made? This research is unable to provide answers to such questions as this.

transaction would tend towards zero and would always be less than the PIT paid per transaction. Therefore, given the same income and consumption tax rates, the per transaction loss arising from the payment of income tax (always) exceeds the per transaction loss from the payment of the consumption tax.

3.4 Empirical analysis

3.4.1 Data

We studied a panel of 52 (out of the 54) countries in Africa for the period 1980 to 2013. Somalia and South Sudan were excluded because of the unavailability of sufficient data. The data on taxes were retrieved from the International Centre for Tax and Development (ICTD) Government Revenue Dataset, while the economic and demographic data were sourced from the World Development Indicators of the World Bank.⁹ The data on conflict were retrieved from the Uppsala Conflict Data Program/ Centre for the Study of Civil Wars, Peace Research Institute Oslo (UCDP/PRIO) Armed Conflict Dataset, Version 4-2015. These countries were analysed based on certain common characteristics including the level of direct and indirect taxes.

This research used Type 3 (*“internal armed conflict occurring between the government of a state and one or more internal opposition group(s) without intervention from other states”*) and Type 4 (*“internationalized internal armed conflict occurring between the government of a state and one or more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides”*) conflicts in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 of Uppsala University, Sweden (Themnér, 2015). Furthermore, since the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 is presented in days, this research defines an **internal conflict month** as a Type 3 and/or Type 4 conflict in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 that occurs within a period ranging from one day to one calendar month.¹⁰ Following Alesina and Perotti's (1996) argument that political instability could be measured not only by the ‘propensity to observe government changes’, but also by social unrest and political violence, which may be evident through mass violence, civil wars, political disorder and physical threats, the political instability variable is constructed as the average of the summation of the frequency of government change in a year and the number of internal conflict months in a year¹¹, thus

⁹ There are no cyclically adjusted data in our database. The original data is thus used.

¹⁰ External conflict is not included in this research because the impact of such type of conflict on the relationship between external conflict and the tax structure, as well as, performance of the domestic economy may not be clearly ascertained.

¹¹ This measure of political instability implies an equal weight of 50:50 being applied to the frequency of government change in a year and the number of conflict months in a year, respectively. Ratios of 60:40 and 40:60 produced largely similar results in preliminary testing, although the estimated parameter values were greater and

$$\text{Political Instability (PI)} = \frac{\text{Frequency of government changes (FGC)} + \text{Internal conflict months}}{2} \quad (5)$$

To measure the relationship, political instability could be determined as an increasing function of the ratio of direct taxes (as a percentage of GDP) to indirect taxes (as a percentage of GDP). It is expected that the higher the value of direct taxes relative to indirect taxes, the greater the political instability. Hence,

$$PI = f\left(\frac{\text{Direct taxes (DT)}}{\text{Indirect taxes (IT)}}\right) \quad (6)$$

Since the administration of direct taxation requires a greater degree of sophistication than indirect taxation does, it is expected here that in a politically unstable environment, especially when war is fought, direct taxes are more easily affected and, therefore, reduced to a greater extent than indirect taxes (Sanford, 2000). From the contrary point of view, it is expected that the loss of income resulting from the payment of direct tax, relative to indirect tax, would have a direct relationship with political instability. This point of view thus indicates that the change in direct tax causes political instability and not the other way around.

For a comparison, the Political Stability and Absence of Violence/Terrorism estimate in the World Governance Index of the World Bank was also used. The analysis using this dataset for political stability runs from 1996 to 2013, although data is unavailable for the years 1997, 1999 and 2001.

With regard to another form of taxation, that is, seigniorage or the ‘inflation tax’, Cukierman et al. (1992) found that political instability was positively associated with seigniorage. They stated that countries with a more unstable and polarized political system will have more inefficient tax structures and, thus, will rely more heavily on seigniorage. Cukierman et al. (1992) argued that at any given moment in time, the existing tax system acts as a constraint on the fiscal policy of the current government, which according to them, suggests that tax reforms are also determined by strategic considerations, that is, a tax system is designed by taking into account how it will constrain the fiscal policies of future governments. Thus, if there are political instability and political polarization, these strategic considerations may induce the current government to leave an inefficient tax system to its successors. Aisen and Veiga (2008) also found for a panel of 100 countries from 1960 to 1999 that political instability leads to higher seigniorage, which was especially the case in developing, less democratic and socially polarized countries. Seigniorage, defined by Cukierman et al. (1992) as the ratio of high-powered money to total national income, multiplied by the rate of inflation, is included in

more statistically significant with a higher coefficient of determination (r^2) and greater statistical significance of the f -statistic for the model used when the greater weight was applied to the number of conflict months (that is, 40:60) than the contrary (that is, 60:40).

this analysis to determine how government revenue generation through inflation influences the level of political stability in the countries under study.

Parvin (1973) found, for a weighted regression of a panel of 26 countries, that the level of income per capita significantly reduced the risk of political unrest. The duration of war entailed the conversion/reapplication of resources away from the production of regular consumption commodities into the production of military hardware, as well the reapplication of human resources into the execution of the war. Consequently, individuals have to choose between either engaging in war and losing the potential income they would have earned had the war not started or not engaging in war and thus earn the current incomes. A sufficiently large income per capita thus increased the opportunity cost of war, as protagonists in a war had more to lose, the higher the income level. Collier and Hoeffler (2011) similarly found that high per capita income reduced the duration of civil war and the probability of its occurrence. To the contrary, the lower the current income levels, the lower the opportunity cost of war, and thus individuals had “little or nothing to lose” in the event of a war. Furthermore, protagonists in the war, hopeful of winning and altering the distribution of income and wealth to their advantage, have even more reason to engage in war.

With regard to socio-demographic conditions, Parvin (1973) found that urbanization significantly reduced the risk of political unrest. He argued that the degree of urbanization reflects a degree of exposure to modernity by the segment of the population and modernization has certain desirable economic benefits. If those desirable economic benefits were realised, the propensity for political unrest would be reduced. Parvin (1973), as well as, Blanco and Grier (2009), and Armah and Amoah (2010) found that urbanization was significantly related to political stability.

External debt obligations may reduce government spending on public services, which may have consequences for political stability. Hence, the balance of payments position would serve an important role in determining the constraints placed on government as regards the provision of needed public goods. The current account balance, a component of the balance of payments, is, therefore, included in the model.

Table 3-1 – Average direct tax-to-indirect tax ratio and standard deviations of tax (1980-2013)

	Country Name	Average direct tax-to-indirect tax ratio (DITR)	Standard deviations of		
			direct tax	indirect tax	total tax
1	Algeria	0.46	1.25	1.63	2.98
2	Angola	0.38	0.91	1.44	1.59
3	Benin	0.39	0.72	2.63	3.10
4	Botswana	0.48	1.29	3.41	4.30
5	Burkina Faso	0.35	0.54	1.46	2.14
6	Burundi	0.39	0.53	1.13	1.37
7	Cabo Verde	0.46	0.42	1.18	3.21
8	Cameroon	0.33	0.71	1.24	1.47
9	Central African Republic	0.36	0.39	1.13	1.63
10	Chad	0.55	0.62	0.62	0.91
11	Comoros	0.24	0.68	1.50	1.29
12	Congo, Dem. Rep.	0.44	0.78	1.90	3.32
13	Congo, Rep.	0.53	1.15	2.13	3.48
14	Cote d'Ivoire	0.34	0.53	1.82	2.56
15	Djibouti	0.73	0.94	2.90	3.00
16	Egypt, Arab Rep. [†]	0.77	1.12	1.06	1.25
17	Equatorial Guinea	0.53	0.44	4.94	8.60
18	Eritrea	0.80	1.71	1.60	2.02
19	Ethiopia	0.84	1.69	1.62	1.26
20	Gabon	0.39	0.74	1.18	1.58
21	Gambia, The	0.32	0.94	1.71	1.70
22	Ghana	0.41	1.42	1.28	2.43
23	Guinea	0.26	1.05	2.48	3.22
24	Guinea-Bissau	0.24	0.50	1.11	1.56
25	Kenya	0.67	1.04	1.03	1.68
26	Lesotho	0.26	3.19	6.48	8.24
27	Liberia	0.55	2.99	4.13	5.52
28	Libya	0.96	0.96	3.47	3.31
29	Madagascar	0.28	0.54	1.11	1.25
30	Malawi	0.74	1.53	1.38	2.43
31	Mali	0.22	0.48	1.72	2.00
32	Mauritania	0.48	0.56	0.65	1.24
33	Mauritius	0.31	0.90	1.44	1.47
34	Morocco	0.47	3.03	0.88	2.63
35	Mozambique	0.36	1.63	1.57	2.85
36	Namibia	0.52	2.03	2.08	2.70
37	Niger	0.33	0.33	1.67	1.77
38	Nigeria	0.50	0.42	0.84	0.95
39	Rwanda	0.40	0.90	1.14	1.64
40	Sao Tome and Principe	0.40	1.52	3.02	4.40
41	Senegal	0.37	1.09	1.90	2.19
42	Seychelles	0.27	1.07	2.96	6.34
43	Sierra Leone	0.45	1.04	1.44	1.98
44	South Africa	1.57	1.25	1.23	2.30
45	Sudan	0.28	0.45	1.00	2.56
46	Swaziland	0.41	0.82	5.33	6.59
47	Tanzania	0.68	2.19	1.42	1.60
48	Togo	0.41	0.84	1.85	3.55
49	Tunisia	0.58	1.64	1.18	0.85
50	Uganda	0.33	1.02	1.45	2.28
51	Zambia	0.84	0.77	0.94	2.65
52	Zimbabwe	1.02	3.75	3.71	6.84
	Average	0.49	1.14	1.93	2.76

Source of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

[†]For Egypt, because the “Non-Resource Component of Indirect Tax” is omitted, “Total Indirect Taxes, including resource revenues” and “Direct taxes excluding social contributions, including resource revenue” instead of “Direct taxes excluding social contributions and resource revenue” were used as Indirect Tax and Direct Tax, respectively. For all the other countries, the “Non-Resource Component of Indirect Tax” was used as Indirect Tax, while “Direct taxes excluding social contributions and resource revenue” was used as Direct Tax.

This analysis took the average direct tax-to-indirect tax ratio (**DITR**) and standard deviations of the direct tax, indirect tax and total tax for the period 1980 to 2013 and these are shown in Table 3-1. The country with the lowest average **DITR** is Mali with the average value of direct tax being approximately equal to 22% of the value of indirect tax. South Africa has the highest ratio of approximately 1.57. The average for all the countries is approximately 0.49. The ratios for thirty-four (34), that is, about two-thirds of the fifty-two (52) countries under study are less than 0.5. For the standard deviations of the direct tax, Niger has the lowest at 0.33 while Zimbabwe has the highest at 3.75. The average for all the countries is 1.14. On the other hand, Chad has the lowest standard deviation of the indirect tax at 0.62, while 6.48 for Lesotho is the highest. The average is 1.93. The standard deviation of total tax is lowest in Tunisia at 0.85 and highest in Equatorial Guinea at 8.60.

3.4.2 Econometric model

The Fixed-Effects regression estimation method was applied in the analysis of the following econometric model:

$$PI_{it} = \alpha_i + \gamma_1 PI_{it-1} + \gamma_2 \left(\frac{DT}{IT} \right)_{it} + \gamma_3 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_4 GDPpc_{it} + \gamma_5 Urban_{it} + \gamma_6 CAB_{it} + \varepsilon_{it} \quad (7)$$

for $i = 1, \dots, N$, $t = 1, \dots, T$, where PI_{it} is political instability for country i in the year t . For the set of government revenue sources (**R**) for the respective countries i in year t , $\left(\frac{DT}{IT} \right)_{it}$ is the ratio of direct taxes to indirect taxes (**DITR**) and $\left(\frac{\pi H}{Y} \right)_{it}$ is seigniorage. Both **R** variables are expected to be inversely related to political instability. For the level of economic activity (**E**), $GDPpc_{it}$ is the per capita Gross Domestic Product, while for socio-demographic variables (**D**), $Urban_{it}$ is for urbanization. CAB_{it} is the external sector (**Ext**) variable. α_i is the country-specific effect that captures the characteristics that are unchanged over time. The parameters to be estimated are $\gamma_1, \gamma_2, \dots, \gamma_6$, and ε_{it} is an i.i.d error term.

3.4.3 Empirical results

Data for the panel of all 52 countries were first analysed. Subsequent analysis categorized countries according to the levels of the average (**DITR**) for the period 1980 to 2013, the standard deviation of direct tax for the period, and whether the standard deviation of direct tax exceeded that of indirect tax, and vice versa.

3.4.3.1 *The average direct tax-to-indirect tax ratio*

The results shown in Table 3-2 are for the analysis of political instability measured as the composite of the frequency of government change and internal conflict months. The results indicate the absence of a significant relationship between the **DITR** and political instability in a model that includes all the countries under study. However, when the countries are analysed in groups delineated by the average **DITR**, a pattern of relationships emerges. The tax groups were formed by incremental values of 10% of the average **DITR** ranging from the value of direct tax being equal to 20% of the value of indirect tax, through to the value of direct tax being equal to 100% of indirect tax and above. In the countries where the average **DITR** was less than 5:10 up to those with a ratio of less than 8:10, an inverse relationship exists, such that higher direct tax relative to indirect tax lowers the level of political instability. On the contrary, for the country groups where the average **DITR** was greater than or equal to 6:10 up to those with a ratio greater than or equal to 9:10, higher direct tax relative to indirect tax raises the level of political instability. However, it should be noted that for the analysis based on the average **DITR**, only results that show a significant relationship are displayed on the table. Consequently, for the ratio greater than or equal to 6:10, the result for the model that includes the revenue sources (**R**) and the level of economic activity (**E**) is shown on the table, while for the ratios greater than or equal to 7:10, only the model that includes the revenue sources (**R**) is shown. The **R,E,D** and **R,E,D,Ext** analyses for these three cases are not shown even though they all indicate a direct relationship between the **DITR** and political instability, as a result.

It is noticeable that there is an overlapping of the results for the groups with ratios greater than or equal to 6:10 but less than 8:10. To determine what relationship exists between the **DITR** and political instability for this group of countries, the data for these countries is analysed separately and shown in the last column in Table 3-2. Although the relationship between the **DITR** and political instability is not significant, it is shown to be positive. This indicates that the significant negative results found for the groups with average ratios greater than or equal to 6:10 but less than 8:10, shown in the “less than” group of columns, are the result of the overwhelming influence of the larger number of countries in these groups where there is an inverse relationship between the **DITR** and political instability. Consequently, we may conclude that for the countries under study, when the average ratio of direct tax-to-indirect tax is greater than or equal to 6:10, increasing direct tax relative to indirect tax raises the level of political instability.

Table 3-2 – Fixed-Effects (Robust Standard Errors) Regression: Political instability (frequency of government change and conflict months), direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance

	All countries				Average Direct-to-Indirect Tax Ratio (1980-2013)								
					Less than				Greater than or equal to				
					5:10	6:10	7:10	8:10	6:10	7:10	8:10	9:10	6:10-8:10
	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E)	(R)	(R,E)	(R,E,D,Ext)	(R,E,D,Ext)
L.Equal weight FGC*UppsalaIntConfMonths	0.677*** (0.054)	0.677*** (0.055)	0.677*** (0.055)	0.675*** (0.055)	0.695*** (0.066)	0.660*** (0.063)	0.660*** (0.063)	0.660*** (0.058)	0.699*** (0.105)	0.704*** (0.106)	0.684* (0.166)	0.491 (0.307)	0.675*** (0.098)
Direct/Indirect	-0.138 (0.217)	-0.105 (0.255)	-0.106 (0.258)	-0.128 (0.281)	-0.824* (0.305)	-1.019** (0.291)	-0.974** (0.287)	-0.904** (0.279)	0.507* (0.217)	0.361* (0.151)	0.542* (0.195)	0.781* (0.146)	0.559 (1.921)
Seigniorage ($\pi H/Y$)	-0.00000202 (0.000)	-0.00000205 (0.000)	-0.00000203 (0.000)	0.000000396 (0.000)	0.000000679 (0.000)	0.000000808 (0.000)	0.000000814 (0.000)	0.000000628 (0.000)	-0.000247 (0.000)	0.0000223 (0.000)	0.000319 (0.000)	0.000418 (0.000)	-0.000620 (0.000)
GDP per capita (constant 2005 US\$)		-0.0000295 (0.000)	-0.0000300 (0.000)	-0.0000115 (0.000)	-0.0000310 (0.000)	0.0000702* (0.000)	0.0000675* (0.000)	0.0000640* (0.000)	-0.000839** (0.000)		-0.000646 (0.000)	-0.000488 (0.001)	-0.00129 (0.002)
Urban population (% of total)			0.000769 (0.008)	-0.000910 (0.008)	0.00420 (0.008)	0.00592 (0.010)	0.00607 (0.009)	0.00567 (0.009)				-0.203 (0.131)	-0.0183 (0.017)
Current account balance (% of GDP)				-0.00441 (0.003)	-0.00370 (0.004)	-0.00505 (0.003)	-0.00514 (0.003)	-0.00542 (0.003)				-0.0164 (0.043)	-0.0156 (0.021)
Constant	0.447*** (0.117)	0.479*** (0.104)	0.453 (0.272)	0.484 (0.314)	0.540* (0.237)	0.440 (0.309)	0.420 (0.296)	0.429 (0.293)	1.321* (0.511)	0.0470 (0.344)	1.611 (0.912)	13.85 (11.341)	1.504* (0.567)
r2	0.453	0.453	0.453	0.453	0.502	0.447	0.446	0.448	0.554	0.515	0.611	0.765	0.508
No. of observations	1165	1165	1165	1111	777	918	965	1031	217	168	98	46	113
Residual degrees of freedom	51	51	51	51	33	40	42	46	10	8	4	2	5
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000	-	-
No of countries	52 ^a	52	52	52	34 ^b	41 ^c	43 ^d	47 ^e	11 ^f	9 ^g	5 ^h	3 ⁱ	6 ^j

Standard errors in parentheses

Sources of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; World Bank. (2015, June). World Development Index

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

^b Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Comoros, Congo, Dem. Rep., Cote d'Ivoire, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^c Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^d Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^e Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^f Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Kenya, Libya, Malawi, South Africa, Tanzania, Zambia, Zimbabwe.

^g Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Libya, Malawi, South Africa, Zambia, Zimbabwe.

^h Ethiopia, Libya, South Africa, Zambia, Zimbabwe.

ⁱ Libya, South Africa, Zimbabwe.

^j Djibouti, Egypt, Arab Rep., Eritrea, Kenya, Malawi, Tanzania.

It is interesting to note that besides the lag of the political instability variable, which has a significant direct relationship with political instability in the current period, and the GDP per capita, which has a significant inverse relationship with political instability as shown in the column for the average **DITR** being greater than or equal to 6:10, seigniorage exhibits a similar relationship with political instability as does the **DITR**. For the group of countries where the average **DITR** is less than 5:10, seigniorage has a significant inverse relationship with political instability while it has a significant direct relationship with political instability in the countries where the average **DITR** is greater than or equal to 8:10.

3.4.3.2 Fluctuations in the direct tax

In politically unstable countries, especially those affected by conflict, it is expected that the administrative structures required for the administration of tax would be considerably weakened. Moreover, because direct taxation requires a greater degree of sophistication than indirect taxation does, it is expected that it would tend to be more volatile when conditions of political instability exist than the indirect tax would be. As a result, because direct taxation is expected to be relatively more volatile in politically unstable situations as compared to indirect taxation, and, therefore, negatively affected by political instability to a greater extent than indirect taxation would be, the ratio of direct-to-indirect tax would run countercyclical with the level of political instability. This implies that greater political instability would result in lower direct tax collection as compared to indirect tax collection. This analysis invariably assumes that incidences of political instability precede (and, therefore, cause) the change in the level of taxation, particularly, direct taxation.

The preceding argument then raises a question as regards the nature of the causality between the level of political instability and volatility in direct tax collection. This would be with regard to the spread (or dispersion) in successive values of direct tax relative to indirect tax arising from incidences of political instability. Greater political instability would be expected to have an influence on the spread (dispersion) in the levels of tax collection, particularly, direct taxation in relation to indirect taxation. Thus, wider spreads (dispersion) in the successive values of direct taxation would be correlated with political instability, positively or negatively. In other words, it is expected that in politically unstable societies, particularly those that have been affected by conflict, the wider the spread (dispersion) in the successive values of direct tax payments, there would exist a strong, positive or negative, correlation between the **DITR** and political instability. Moreover, as stated earlier, a negative correlation would be indicative of incidences of political instability preceding (and, therefore, causing) the fluctuation in the direct tax. Conversely, a positive correlation would indicate that the change in the direct tax causes the feeling of loss in the taxpayer, which in turn causes the conditions for political instability. This is so because incidences of political instability, by weakening administrative structures, as argued above, can

only cause a depression rather than an increase in direct tax collection when political instability precedes the change in direct taxation.

Using standard deviations of direct tax for the respective countries, the research measured the influence of fluctuations in the levels of direct tax on the relationship between the **DITR** and political instability. The results shown in Table 3-3 indicate a significant inverse relationship between the **DITR** and political instability for countries where the standard deviation of direct tax for the period ranged from less than 0.6 to less than 0.9. This inverse relationship suggests that incidences of political instability in these countries where the value of direct tax collection fluctuates relatively moderately precede the reduction in the direct tax relative to the indirect tax. To the contrary, there is a direct, although statistically not significant (and, therefore, not shown in the table), relationship between the **DITR** and political instability in countries where the standard deviation of direct tax is greater than or equal to 0.5, 0.6, 0.7, 0.8, 0.9, 1.1, 1.2, and 3.0.

3.4.3.3 The average direct tax-to-indirect tax ratio and fluctuations in the direct tax

Combining the standard deviation of direct tax for countries where there was a direct, but statistically not significant, relationship between the **DITR** and political instability, and the average **DITR** to ascertain their combined influence on the relationship between the **DITR** and political instability, an interesting result appears. The results of this analysis, presented in the second part of Table 3-3, show that, for the countries where the average **DITR** was greater than or equal to 6:10 and whose **R,E,D** analysis was not statistically significant and, therefore, not shown in Table 3-2, when the effects of the average **DITR** of 6:10 and a standard deviation of 1.3 are combined, the **R,E,D** analysis shows a significant direct relationship between the **DITR** and political instability. The same is true when the effects of the average **DITR** of 7:10, whose **R,E,D** analysis was also not statistically significant and, therefore, not shown in Table 3-2, and a standard deviation of 1.3 are combined. These results thus indicate that higher **DITR** and wider fluctuations in the direct tax significantly raise the level of political instability.

Following the argument that an inverse relationship between the **DITR** and political instability indicates that incidences of political instability precede (and, therefore, cause) fluctuations in direct tax, the foregoing analyses, which show a positive relationship between the **DITR** and political instability when wider fluctuations in the direct tax are combined with higher **DITR**, suggest that the fluctuations in the direct tax precede (and, therefore, cause) the incidences of political instability. This assertion relies on the argument that higher direct tax relative to indirect tax generates a feeling of loss in the taxpayer and consequently creates conditions that result in greater political instability.

Table 3-3 – Fixed-Effects (Robust Standard Errors) Regression: Political instability (frequency of government change and conflict months), direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance

	Standard Deviations of Direct Tax (1980-2013)				Average Direct-to-Indirect Tax Ratio and Standard Deviations of Direct Tax (1980-2013), respectively					Standard Deviations of Direct Tax exceed those of Indirect Tax and Average Direct-to-Indirect Tax Ratio is greater than or equal to
	Less than				Greater than or equal to					
	0.6	0.7	0.8	0.9	6:10 & 0.8	6:10 & 1.3	6:10 & 1.6	7:10 & 1.3	7:10 & 1.6	5:10
	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E)	(R,E,D)	(R,E,D)	(R,E,D)	(R,E)	(R,E)
L.Equal weight FGC*UppsalaIntConfMonths	0.692*** (0.096)	0.611*** (0.115)	0.616*** (0.103)	0.646*** (0.085)	0.700*** (0.105)	0.513** (0.062)	0.519** (0.056)	0.522** (0.045)	0.527** (0.043)	0.667*** (0.131)
Direct/Indirect	-1.241* (0.478)	-1.274* (0.459)	-1.156* (0.433)	-1.069* (0.413)	0.507* (0.219)	0.228*** (0.025)	0.220** (0.025)	0.233* (0.067)	0.194* (0.043)	0.207* (0.088)
Seigniorage (π H/Y)	-0.000145 (0.000)	-0.000136 (0.000)	0.000000836 (0.000)	0.000000834 (0.000)	-0.000249 (0.000)	-0.000432 (0.000)	-0.000501 (0.000)	-0.000505 (0.000)	-0.000559 (0.000)	-0.000344 (0.000)
GDP per capita (constant 2005 US\$)	0.000105* (0.000)	0.000112* (0.000)	0.000102* (0.000)	0.0000956* (0.000)	-0.000843** (0.000)	-0.000212 (0.001)	-0.000191 (0.001)	0.000790 (0.002)	0.000603 (0.002)	-0.000191 (0.000)
Urban population (% of total)	0.0308 (0.019)	0.0407 (0.022)	0.0289* (0.014)	0.0245 (0.013)		0.00836 (0.013)	0.00891 (0.016)	0.0290 (0.029)		
Current account balance (% of GDP)	-0.00356 (0.003)	-0.00556 (0.004)	-0.00464 (0.003)	-0.00465 (0.003)						
Constant	-0.175 (0.537)	-0.321 (0.596)	-0.269 (0.395)	-0.124 (0.336)	1.378* (0.529)	0.492 (0.502)	0.620 (0.641)	-0.0731 (1.123)	0.815 (0.792)	0.663 (0.576)
r2	0.476	0.372	0.374	0.409	0.556	0.280	0.286	0.293	0.297	0.447
No. of observations	290	329	428	488	206	102	81	77	56	219
Residual degrees of freedom	12	14	19	22	9	4	3	3	2	9
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	-	-	-	-	0.0016
No of countries	13 ^a	15 ^b	20 ^c	23 ^d	10 ^e	5 ^f	4 ^g	4 ^h	3 ⁱ	10 ^j

Standard errors in parentheses

Sources of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; World Bank. (2015, June). World Development Index

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Burkina Faso, Burundi, Cabo Verde, Central African Republic, Cote d'Ivoire, Equatorial Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Nigeria, Sudan.

^b Burkina Faso, Burundi, Cabo Verde, Central African Republic, Chad, Comoros, Cote d'Ivoire, Equatorial Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Nigeria, Sudan.

^c Benin, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Cote d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Nigeria, Sudan, Zambia.

^d Benin, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Cote d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Nigeria, Rwanda, Sudan, Swaziland, Togo, Zambia.

^e Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Kenya, Libya, Malawi, South Africa, Tanzania, Zimbabwe.

^f Eritrea, Ethiopia, Malawi, Tanzania, Zimbabwe.

^g Eritrea, Ethiopia, Tanzania, Zimbabwe.

^h Eritrea, Ethiopia, Malawi, Zimbabwe.

ⁱ Eritrea, Ethiopia, Zimbabwe.

^j Chad, Egypt, Arab Rep., Eritrea, Ethiopia, Kenya, Malawi, South Africa, Tanzania, Tunisia, Zimbabwe.

Furthermore, from the standard deviations of direct and indirect tax shown in Table 3-1, it would be noticed that the standard deviation of direct tax exceeds the standard deviation of indirect tax in 13 (or one-quarter) of the 52 countries. So, setting the countries into groups where the standard deviation of direct tax exceeds that of indirect tax and vice versa, the research analysed the relationship between the **DITR** and political instability for these groups. Although neither results showed a statistically significant relationship, the group of 13 countries where the standard deviation of direct tax exceeds the standard deviation of indirect tax showed a direct (although, statistically not significant and, therefore, not shown) relationship between the **DITR** and political instability. The result is reversed for the second group where the standard deviation of direct tax is lower than the standard deviation of indirect tax with an inverse (although, statistically not significant and, therefore, also not shown) relationship between the **DITR** and political instability. Going further to combine the effects of these groupings and the average **DITR**, the research found that for countries where the standard deviation of direct tax exceeds the standard deviation of indirect tax, the threshold for a significant positive relationship between the **DITR** and political instability is pushed below the greater than or equal to 6:10 mark for the average **DITR**, to greater than or equal to 5:10, as shown by the **R,E** analysis in the last column of Table 3-3.

Analysing further the group of countries where the standard deviation of direct tax exceeds that of indirect tax and the average **DITR** is greater than or equal to 5:10, and now including the countries where the standard deviation of direct tax is greater than or equal to 1.5 and 1.6, respectively, the results show for both cases that the **R,E,D** analysis, which had previously been statistically not significant when the average **DITR** is greater than or equal to 5:10, is now statistically significant, as shown in the last two column groups in Table 3-4. Moving further still, for the group of countries where the standard deviation of direct tax exceeds that of indirect tax, a statistically significant direct relationship between the **DITR** and political instability was found at an even lower threshold for the average **DITR** (at greater than or equal to 4:10) when the standard deviation of the direct tax was higher, at greater than or equal to 1.7, as shown in the first group of columns in Table 3-4. Since there were no other countries in the sample where the standard deviation of direct tax exceeds that of indirect tax and the standard deviation of the direct tax was greater than or equal to 1.7, and which had a lower average **DITR**, we may conclude that for all the countries studied in this research, when the standard deviation of direct tax exceeds that of indirect tax and the standard deviation of direct tax is high (in this case greater than or equal to 1.7), the **DITR** has a significant direct relationship with political instability.

Table 3-4 – Fixed-Effects (Robust Standard Errors) Regression: Political instability (frequency of government change and conflict months), direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance

	Standard Deviations of Direct Tax exceed those of Indirect Tax, and Average Direct-to-Indirect Tax Ratio is greater than or equal to											
	2:10~4:10				5:10							
	Standard Deviations of Direct Tax (1980-2013) greater than or equal to											
	1.7				1.5				1.6			
	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Equal weight FGC*UppsalaIntConfMonths	0.887*** (0.044)	0.827** (0.073)	0.808*** (0.056)	0.721*** (0.039)	0.508*** (0.068)	0.509*** (0.067)	0.510*** (0.067)	0.499*** (0.051)	0.514** (0.062)	0.515** (0.062)	0.516** (0.061)	0.502*** (0.037)
Direct/Indirect	-0.0639 (0.173)	0.354* (0.075)	0.463* (0.099)	-0.571 (0.828)	0.236** (0.048)	0.218** (0.044)	0.222*** (0.027)	0.260 (0.143)	0.225* (0.053)	0.207* (0.050)	0.214** (0.029)	0.216 (0.231)
Seigniorage ($\pi H/Y$)	-0.000970 (0.000)	-0.000951 (0.000)	-0.000930* (0.000)	-0.00102** (0.000)	-0.000417 (0.000)	-0.000418 (0.000)	-0.000422 (0.000)	-0.000462 (0.000)	-0.000485 (0.000)	-0.000486 (0.000)	-0.000490 (0.000)	-0.000484 (0.000)
GDP per capita (constant 2005 US\$)		-0.000769 (0.000)	-0.000612 (0.001)	0.000738 (0.001)		0.0000976 (0.000)	0.0000727 (0.000)	0.000177 (0.000)		0.000100 (0.000)	0.0000733 (0.000)	0.000242 (0.000)
Urban population (% of total)			-0.0246 (0.035)	-0.132 (0.086)			0.00604 (0.015)	-0.0116 (0.029)			0.00650 (0.018)	-0.0249 (0.036)
Current account balance (% of GDP)				-0.0539* (0.011)				-0.0570* (0.019)				-0.0697 (0.027)
Constant	0.355 (0.222)	0.803 (0.394)	1.448 (0.784)	4.832 (2.516)	0.494* (0.171)	0.431 (0.195)	0.282 (0.425)	0.565 (0.923)	0.607* (0.179)	0.530 (0.209)	0.352 (0.556)	1.107 (1.274)
r2	0.792	0.798	0.800	0.835	0.274	0.274	0.274	0.337	0.279	0.280	0.280	0.346
No. of observations	90	90	90	68	122	122	122	98	101	101	101	79
Residual degrees of freedom	3	3	3	3	5	5	5	5	4	4	4	4
Prob > F	0.0007	-	-	-	0.0000	0.0000	0.0000	-	0.0000	0.0000	-	-
No of countries	4 ^a	4	4	4	6 ^b	6	6	6	5 ^c	5	5	5

Standard errors in parentheses

Sources of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; World Bank. (2015, June). World Development Index

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Eritrea, Morocco, Tanzania, Zimbabwe.

^b Eritrea, Ethiopia, Malawi, Tanzania, Tunisia, Zimbabwe.

^c Eritrea, Ethiopia, Tanzania, Tunisia, Zimbabwe.

Table 3-5 – Fixed-Effects (Robust Standard Errors) Regression: Political stability and absence of violence/terrorism estimate, direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance (1996-2013)

	All countries				Average Direct-to-Indirect Tax Ratio (1980-2013)							
					Greater than							
					3:10	4:10	5:10	6:10	7:10	8:10	9:10	1:1
	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D)	(R)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.624***	0.608***	0.610***	0.617***	0.604***	0.652***	0.716***	0.683***	0.719***	0.652**	0.899*	-0.801
	(0.058)	(0.045)	(0.045)	(0.047)	(0.063)	(0.080)	(0.077)	(0.121)	(0.115)	(0.137)	(0.100)	(0.108)
Direct/Indirect	-0.0160	-0.0234	-0.0184	-0.0251	-0.0240	-0.0410	-0.0817*	-0.0872**	-0.0837*	-0.0684*	-0.121*	0.294
	(0.032)	(0.036)	(0.035)	(0.033)	(0.040)	(0.040)	(0.029)	(0.027)	(0.027)	(0.024)	(0.022)	(0.195)
Seigniorage ($\pi H/Y$)	-0.000118*	-0.000102*	-0.0000955*	-0.000108*	-0.000131*	-0.000144*	-0.000212**	-0.000115*	-0.000112	-0.000115**	-0.000273***	-0.000512
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita (constant 2005 US\$)		0.0000530	0.0000628	0.0000590	0.0000630	0.0000573	0.0000354	0.000173**	0.000161*	0.000199**		0.000154
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)
Urban population (% of total)			-0.0155	-0.0184	-0.0115	-0.0100	-0.00137	0.000558	-0.0644	-0.0610		-0.184
			(0.009)	(0.009)	(0.010)	(0.014)	(0.019)	(0.035)	(0.035)	(0.042)		(0.020)
Current account balance (% of GDP)				0.00106	0.00102	0.00121	0.00187	0.00262	0.00521			-0.00749
				(0.002)	(0.001)	(0.002)	(0.003)	(0.005)	(0.005)			(0.010)
Constant	-0.104	-0.229	0.394	0.532	0.259	0.258	-0.0303	-0.450	2.613	2.325	0.270*	2.362*
	(0.053)	(0.121)	(0.323)	(0.338)	(0.371)	(0.471)	(0.640)	(1.516)	(1.808)	(2.237)	(0.046)	(0.077)
r2	0.399	0.405	0.412	0.426	0.421	0.467	0.563	0.644	0.695	0.765	0.698	0.899
No. of observations	406	406	406	382	326	207	129	77	57	39	24	14
Residual degrees of freedom	50	50	50	49	41	26	16	9	7	4	2	1
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-	-
No of countries	51 ^a	51	51	51	42(+1) ^b	27 ^c	17 ^d	10 ^e	8 ^f	5 ^g	3 ^h	2 ⁱ

Standard errors in parentheses

Sources of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; World Bank. (2015, June). World Development Index; World Bank. (2016, April). World Governance Indicators

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

^b Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Kenya, Liberia, Libya, Malawi, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

^c Algeria, Botswana, Cabo Verde, Chad, Congo, Dem. Rep., Congo, Rep., Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Ghana, Kenya, Liberia, Libya, Malawi, Mauritania, Morocco, Namibia, Nigeria, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Zambia, Zimbabwe.

^d Chad, Congo, Rep., Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Kenya, Liberia, Libya, Malawi, Namibia, Nigeria, South Africa, Tanzania, Tunisia, Zambia, Zimbabwe.

^e Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Kenya, Libya, Malawi, South Africa, Tanzania, Zambia, Zimbabwe.

^f Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Libya, Malawi, South Africa, Zambia, Zimbabwe.

^g Ethiopia, Libya, South Africa, Zambia, Zimbabwe.

^h Libya, South Africa, Zambia, Zimbabwe.

ⁱ South Africa, Zimbabwe.

3.4.4 Robustness check

The check the robustness of the results found, the analysis used the Political Stability and Absence of Violence/Terrorism estimate in the World Governance Index of the World Bank as the measure of political stability. Since the Political Stability and Absence of Violence/Terrorism estimate indicates political stability rather than instability, equation 7 is modified to reflect the difference, thus

$$PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{DT}{IT} \right)_{it} + \gamma_3 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_4 GDPpc_{it} + \gamma_5 Urban_{it} + \gamma_6 CAB_{it} + \varepsilon_{it} \quad (8)$$

where PS_{it} is political stability for country i in the year t .

The results derived are largely similar to those found using the frequency of government change and internal conflict months indicator for political instability. The results, presented in Table 3-5, show that increases in the **DITR** in countries where the average **DITR** is greater than or equal to 5:10 up to a ratio greater than or equal to 8:10 lowers the level of political stability (that is, raises the level of political instability). There is, however, no evidence of a statistically significant direct relationship between the **DITR** and political stability (that is, a statistically significant inverse relationship between the **DITR** and political instability) as was found in the analysis in Table 3-2.

Here also, the lag of political stability raises the level of political stability in the current period, just as does the GDP per capita. On the contrary, seigniorage and urbanization inversely affect the level of political stability.

The analyses using the Political Stability and Absence of Violence/Terrorism estimate in the World Governance Index of the World Bank do not show any significant relationships with regard to fluctuations in the direct tax. Like the previous set of analyses, however, when the standard deviation of direct tax is combined with average **DITR**, the threshold for a significant relationship between the **DITR** and political stability is lowered. In this case, when average **DITR** of 4:10 is combined with a standard deviation of direct tax of 0.9, both of which had separately shown a statistically not significant inverse relationship between the **DITR** and political stability, there results a statistically significant inverse relationship between the **DITR** and political stability, as shown in Table 3-6.

Further analysis uses the System Generalized Methods of Moments (SGMM) to account for the possibility of endogeneity among the explanatory variables. Here, the **DITR**, seigniorage, GDP per capita and the current account balance are taken as endogenous variables with a maximum of one-lag used as an instrument. The one-step (robust standard errors) SGMM results show that at higher average **DITR** (in this case greater than or equal to 4:10 and 5:10, respectively), a higher **DITR** lowers the level of political stability, as were found in the **R,E** and **R,E,D** analyses, respectively. However, since the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991) showed significant respective p-values of 0.0059 and 0.0008, indicating that overidentifying restrictions are not valid (and,

therefore, the results are not shown), a lag of the **DITR** is included in the subsequent analyses, such that equation 8 becomes

$$PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{DT}{IT} \right)_{it} + \gamma_3 \left(\frac{DT}{IT} \right)_{it-1} + \gamma_4 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_5 GDPpc_{it} + \gamma_6 Urban_{it} + \gamma_7 CAB_{it} + \varepsilon_{it} \quad (9)$$

Table 3-6 – Fixed-Effects (Robust Standard Errors) Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1)), direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance

	Average direct tax-to-indirect tax ratio and standard deviation of direct tax greater than or equal to 4:10 and 0.9, respectively			
	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.758***	0.690***	0.713***	0.713***
	(0.079)	(0.070)	(0.071)	(0.072)
Direct/Indirect	-0.0578	-0.0680*	-0.0598	-0.0600
	(0.036)	(0.031)	(0.033)	(0.033)
Seigniorage ($\pi H/Y$)	-0.000168	-0.0000888*	-0.0000794	-0.0000892*
	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita (constant 2005 US\$)		0.000152**	0.000161***	0.000152***
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			-0.0170	-0.0117
			(0.014)	(0.014)
Current account balance (% of GDP)				0.00187
				(0.002)
Constant	0.0342	-0.383**	0.394	0.169
	(0.084)	(0.103)	(0.639)	(0.629)
r ²	0.541	0.585	0.590	0.593
No. of observations	152	152	152	147
Residual degrees of freedom	17	17	17	17
Prob > F	0.0000	0.0000	0.0000	0.0000
No of countries	18	18	18	18

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Index; World Bank. (2016, April). World Governance Indicators

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results, on Table 3-7, show a statistically nonsignificant relationship between the current **DITR** and political stability. However, there is a statistically significant relationship between the one-year lag of the **DITR** and political stability at higher levels of the average **DITR**.¹² These results are,

¹² The basic econometric models in equations 7 and 8 are modified such that direct tax and indirect tax are treated as separate variables rather than as a ratio, resulting in the model $PI_{it} = \alpha_i + \gamma_1 PI_{it-1} + \gamma_2 DT_{it} + \gamma_3 IT_{it} + \gamma_4 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_5 GDPpc_{it} + \gamma_6 Urban_{it} + \gamma_7 CAB_{it} + \varepsilon_{it}$ and $PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 DT_{it} + \gamma_3 IT_{it} + \gamma_4 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_5 GDPpc_{it} + \gamma_6 Urban_{it} + \gamma_7 CAB_{it} + \varepsilon_{it}$, respectively. The results of these analyses shown in Appendices 3-A1 and 3-A2, respectively. In Appendix 3-A1, direct tax lowers the level of political instability in analyses that included all the countries and also in those countries where the average **DITR** are low. However, in countries where the average **DITR** is high, direct tax raises the level of political instability. Similar to the analysis in Appendix 3-A1, where all the countries are analysed, the analysis in Appendix 3-A2, which uses the WGI Political Stability and Absence of Violence/Terrorism estimate, indicates that direct tax lowers the level of political instability (that is, raises the level of political stability) for all the countries. Indirect tax on the other hand lowers the level of political stability when the average **DITR** is low, and raises the level of political stability when the average **DITR** is high. In summary, direct tax lowers the level of political instability when all the countries

however, only valid for the analysis when the average **DITR** is greater than or equal to 5:10, given its statistically nonsignificant Sargan-Hansen p-value, as opposed to those found for the analyses for average **DITR** greater than or equal to 3:10 and 4:10. The explanatory variables in the model are shown to have a statistically significant effect on the model by the statistically significant Wald Chi-squared test results.

Table 3-7 – One-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), direct and indirect tax (endogenous; lagstruct(1,1)), seigniorage (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	Average direct tax-to-indirect tax greater than or equal to					
	3:10	4:10	5:10			
	(R)	(R)	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.908***	0.919***	0.986***	0.956***	0.941***	0.935***
	(0.056)	(0.068)	(0.060)	(0.070)	(0.086)	(0.073)
Direct/Indirect	-0.0171	-0.0411	0.0130	0.0317	0.0336	0.0618
	(0.086)	(0.093)	(0.087)	(0.069)	(0.074)	(0.064)
L.Direct/Indirect	-0.161*	-0.178*	-0.244**	-0.226*	-0.251*	-0.278**
	(0.069)	(0.080)	(0.083)	(0.097)	(0.117)	(0.105)
Seigniorage ($\pi H/Y$)	-0.000218*	-0.000251*	-0.000285**	-0.000284**	-0.000311**	-0.000312**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita (constant 2005 US\$)				0.00000365	7.54e-08	0.00000289
				(0.000)	(0.000)	(0.000)
Urban population (% of total)					0.00352	0.00306
					(0.003)	(0.003)
Current account balance (% of GDP)						-0.000863
						(0.002)
Constant	0.147*	0.220**	0.309***	0.252**	0.134	0.139
	(0.059)	(0.069)	(0.083)	(0.089)	(0.118)	(0.116)
No. of observations	337	211	130	130	130	126
No. of countries	42	27	17	17	17	17
No. of instruments	63	63	63	84	85	102
Hansen (p-value)	0.0190	0.0172	0.1150	0.0735	0.0995	0.0976
AR1 (p-value)	0.0000	0.0000	0.0030	0.0027	0.0027	0.0025
AR2 (p-value)	0.0189	0.0557	0.1233	0.1323	0.1532	0.1870
AR3 (p-value)	0.0335	0.0312	0.3653	0.3609	0.3642	0.3951
Wald chi2	455.61	381.78	2801.15	2738.16	4292.93	5694.13
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Index; World Bank. (2016, April). World Governance Indicators

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

For average **DITR** greater than or equal to 5:10, the results of the autoregressive (AR) processes are in line with expectations. The AR(1) being statistically significant, indicates the presence of first-

are analysed as a group, but raises the level of political instability when the average **DITR** is high. The contrary is true for indirect tax, with regard to the average **DITR**.

order serial correlation arising from the use of the first lag of the dependent variable, political stability, in the model, while AR(2) and AR(3) being statistically nonsignificant, indicate the absence of second- and third-order autocorrelation.

3.5 Summary and conclusion

This paper researched the relationship between the tax structure and political instability. The paper argued, following Hettich and Winer's (1988) characterization of taxation as a “loss” in income, that direct taxation, given the longer interval in its collection and therefore larger per transaction payment, as well as its relative simplicity, generates a greater feeling of loss in the taxpayer relative to the more frequent and therefore smaller per transaction payment of indirect taxation. Using data from 52 African countries for the period 1980 to 2013, the research found there to be a significant direct relationship between the **DITR** and political instability in countries where the average **DITR** for the period was greater than or equal to 6:10. To the contrary, in countries with lower average **DITR** for the period, there was an inverse relationship between the **DITR** and political instability.

The research further found that moderately smaller fluctuations in the direct tax were associated with an inverse relationship between the **DITR** and political instability, suggesting in this case that incidences of political instability precede (and therefore cause) the fluctuations in the direct tax. The research, however, found that wider fluctuations in the direct tax were associated with a direct relationship between the **DITR** and political instability only when the average **DITR** for the period was significantly higher (in this case greater than or equal to 6:10). Furthermore, when there were wider fluctuations in the direct tax relative to the indirect tax and these fluctuations in the direct tax were significantly wide (in this case having a standard deviation greater than or equal to 1.7), the **DITR** had a significant direct relationship with political instability at much lower thresholds of the average **DITR**, such that, for the countries under study in this research, the average **DITR** no longer had an influence on the relationship.

The research, therefore, concludes that higher long-term average **DITR** (in this case greater than or equal to 6:10) results in a significant direct relationship between the **DITR** and political instability. Furthermore, when there are wider fluctuations in the direct tax when the long-term average **DITR** is high (in this case greater than or equal to 6:10), increases in direct taxation relative to indirect taxation also raise the level of political instability. In addition, when the successive values of direct tax vary widely and beyond the fluctuations in the indirect tax, the long-term average **DITR** ceases to be an important determinant of the relationship: increases in the direct tax relative to the indirect tax raise the level of political instability when the value of direct tax fluctuates widely irrespective of the long-term average **DITR**. Hence, high instability in the administration of the direct tax leads to political instability. On the contra side, for countries with a lower long-term average ratio, increasing direct

taxation relative to indirect taxation (or conversely, reducing indirect taxation while holding direct taxation constant) lowers the level of political instability. The same relationship holds when there are smaller fluctuations in the direct tax.

It is recommended, therefore, that the administration of tax should be smoothed over time. This is necessary to avoid the rise in the level of political instability associated with wide fluctuations in the direct tax. Consequently, increases in the direct tax rate, when necessary, should be gradual and spread out over a period.

This research has shown that wide fluctuation in direct tax leads to a situation where the **DITR** is directly related to political instability. However, due to the unavailability of sufficient data on long-term tax rates for the countries under investigation, this research was unable to decipher what caused the fluctuations in tax; whether the fluctuations are the result of fluctuations in the tax rate or inconsistent tax administration. While the fluctuations in the tax rate may be the result of policy inconsistency, which may thus be more easily corrected by the government being consistent with the tax rates, on the one hand, inconsistent tax administration, on the other hand, may be the result of poor administrative structures, administrative bottlenecks or even a greater tendency towards tax avoidance or evasion. Further research would thus be required to ascertain the cause(s) of the fluctuations in the tax so as to be able to investigate such phenomena as the influence of tax evasion on political instability.

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CHAPTER FOUR

DETERMINANTS OF FISCAL DEFICIT IN CONFLICT-AFFECTED STATES IN AFRICA

Abstract

This study examines the determinants of fiscal deficit with a special focus on conflict-affected states, using data from 37 countries in Africa from 1980 to 2013. The study demonstrates that government changes during periods of conflict are related to steep rises in the fiscal deficit. Conflicts that do, or potentially, result in a change in government generate a heightened risk of the government falling, and thus shorten the horizon of the incumbent, who, as a consequence, increases spending on the military to maintain their hold of power. This has the potential to increase the fiscal deficit. The results from empirical analyses show that political instability, measured by the number of internal conflict months, has direct influence on the fiscal deficit. This is found to be especially true for North Africa. The study, therefore, concludes that prolonged instances of conflict significantly increase the fiscal deficit. The study notes that many of the countries under investigation are highly natural resource dependent and this predisposes them to conflict. The decline in economic productivity resulting from the conflict situation and the consequent decline in the tax potential of the economy, at a time when military and relief spending has increased and expenditures on economic and social services need to be maintained, results in a decline of the fiscal balance. Moreover, the volatility of the prices of natural resources brings about fluctuations in the national income. Where government desires to smooth taxes over time, the tendency towards fiscal deficit is increased. Other empirical results indicate that a higher economic growth rate in the preceding year induces government to increase spending in the current year, leading to a higher fiscal deficit, and a decline in the balance of trade in the preceding year also increases the fiscal deficit in the current year.

Keywords: Conflict; war; political instability; fiscal deficit

JEL Classification Numbers: H56, H62

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4.1 Introduction

Periods of war have been correlated with increased government spending and, consequently, higher taxation. The demand for financing a war effort requires the government to increase military expenditure (Collier & Hoeffler, 2011), while at the same time spending to provide relief for victims of the war, in the case of domestic or civil wars. Furthermore, because the occurrence of war and conflict, particularly domestic conflict and civil wars, increases the risk of a government falling, the government is constrained in these circumstances to also increase public expenditures on services to pacify the public and thereby ensure the survival of the government. War, by its nature, however, is destructive to an economy's capacity to produce the output necessary to support the required tax increase (Brück, 1997). By destroying physical and capital assets, and displacing and/or destroying human capital, the duration of war ultimately results in lower production capacity. Consequently, a war situation, by increasing government expenditure and simultaneously reducing economic output, thereby reducing government revenue, will inevitably raise the fiscal deficit, which will, in turn, constrain spending on valued public services. In a politically volatile environment, then, the inability of the government to provide public services may increase the risk of social uprising and political instability, leading to a self-perpetuating cycle of political instability and fiscal deficit.

This study examines the influence of political instability, indicated by the frequency of the change of government and the duration of conflict, on fiscal deficit. To do so, 37 African countries that experienced incidences of war or violent conflict between 1980 and 2013 are selected. Although the World Bank (2011) states that globally the occurrence of inter-state and civil wars has declined, the African continent has in very recent times experienced outbursts of violent conflict in the Central African Republic, the former Sudan, Libya, and Egypt. Furthermore, the influence of war on the fiscal deficit can be seen in the debt profiles of Angola, Guinea-Bissau, and Liberia, for example, whose external debts reached their highest levels in 1994, 1998, and 2003, respectively. Incidentally, these peak debt levels coincided with years in which these three countries were embroiled in war (respectively, the Angolan War of the Cities, the Guinea-Bissau Civil War, and the Fourth Liberian War) (Sarkees & Wayman, 2010). These facts tell us that conflict-affected states in Africa are suitable for studying the influence of wars or conflicts on government budget conditions. Unlike Brück's (1997) study on the macroeconomic effects of the war in Mozambique, which focuses on the effects of war on fiscal deficit in one country, this study focuses on a broader group of countries in Africa where there have been incidences of war or violent conflict. Moreover, while Imai and Weinstein (2000) make use of a static model in their analysis, this study uses both static and dynamic econometric models in its analysis of the determinants of fiscal deficit in the selected countries. This study, therefore, fills these gaps in the study of the relationship between war and fiscal policy in Africa.

The frequency of government change as well as the duration of conflict are used to define political instability. The results show that greater political instability, measured by the duration of conflict, increases the fiscal deficit. This is especially true for the North African region. Because war destroys the capacity of the economy to produce and hence reduces the potential for taxation, while at the same time increasing the need for military and relief expenditures, fiscal deficit is increased more the longer the period of conflict lasts. Furthermore, a higher economic growth rate in the preceding year induces government to increase spending in the current year thus leading to a higher fiscal deficit, while a decline in the balance of trade in the preceding year also increases the fiscal deficit in the current year.

The paper is divided into six sections, with this being the introduction. The remainder of the paper is structured as follows. The following section discusses both the normative and positive approaches in the analysis of fiscal deficit. The positive approach considers the determination of fiscal deficit from two views: the political structure/political instability point of view and the conflict/war point of view. The third section is an overview of the economies under study, which examines their revenue sources, as well as their expenditure patterns. The section on political instability and fiscal deficit examines the relationship between instances of political instability, characterized by conflict periods and changes in government, and fiscal deficit. The remaining sections are the empirical analysis and the summary and conclusion.

4.2 Review of literature

A review of the literature on fiscal deficit shows a combination of normative and positive approaches to the determination of the fiscal deficit.

4.2.1 Normative approach

Barro's (1979) 'tax-smoothing' model argues that government optimizes its deficits to ensure tax rates are kept constant. Set in a closed economy without capital, the model assumes an infinite time period for both the representative agent and the government. The government, which is a benevolent social planner, seeks to maximize the utility of the agent, who works, consumes and saves. To finance the expenditures of the government, the government must tax the agent or issue public debt. Raising finances through taxation, however, generates an excess burden on the agent because taxation involves collection costs that are incurred for the sole purpose of tax collection. Because this represents a loss to both the government and the agent, the government's objective would be to choose the real tax revenue at each period that minimizes the excess burden (or distortionary effects) of taxation, given the desired level of public spending. Therefore, when faced with an unusually sharp increase in government spending, such as the unusually high military spending during wartime, the model specifies that

government should issue debt equal to the amount of the temporarily high increase in government spending in order to spread the increases in tax rates over longer periods and thereby minimize welfare loss. Avoiding abnormally high tax rates by procuring debt while gradually increasing the distortionary income tax rates will smooth tax distortions. Accordingly, the government would issue debt instruments consequent upon temporary increases in government spending, and in line with temporary fluctuations in income, maintain countercyclical deficits and surpluses in the budget. Furthermore, according to Barro (1986), other things being equal, real debt grows at the same rate as the rate of the growth of the economy to ensure that interest payments do not decrease over time relative to the gross national product, which would be inconsistent with stabilizing the average tax rate.

Barro (1986) tests the tax-smoothing model on data from the United States from 1920 to 1982 and finds that they are consistent with the tax smoothing theory, such that the tax to GNP ratio increases and decreases during wartime and peacetime respectively. Furthermore, deficits were countercyclical with business cycles, including the Great Depression.

4.2.2 Positive approach

The review of the literature on the positive approach to the determination of fiscal deficit proceeds in two main directions: the first is the political structure/political instability point of view and then the conflict/war point of view. From the political structure point of view, literature subsequent to Barro's (1979) tax-smoothing theory on the determinants of fiscal deficit shows that government behaviour goes beyond optimizing fiscal deficit to maintain constancy of tax rates, as posited by Barro (1979), and includes political and institutional, as well as economic, variables. Alesina and Tabellini (1990) show that the equilibrium government debt is higher in countries with greater polarization between alternating governments with regard to the type of public goods to be provided and a higher likelihood that the incumbent would not be re-elected. Based on the assumption that there were two different public goods, two political parties and citizens with differing preferences for the composition of public goods provided, the model developed by Alesina and Tabellini (1990) shows that the respective governments, with the objective of providing their preferred public good while deterring the provision of the other public good should the opposition be elected in the next period, increase the deficit in the current period by increasing current expenditure and/or reducing the tax rate. They thus bequeath higher debt levels to the succeeding government than would a benevolent social planner, and ultimately alter the successor's preferences. A variant of this argument is provided by Persson and Svensson (1989), but with regard to the level of provision of a single public good, which may simply be the size of government. Persson and Svensson (1989) show that a conservative government with a preference for a low level of public consumption would borrow more than it would have done, had it remained in power in the future, when it knows that a liberal government with a preference for a higher

level of government consumption will replace it. This action thus puts constraints on the fiscal policy of the succeeding government; a view that is supported by Hallerberg and von Hagen (1999), who state that fiscal deficit constrains spending on public services. Public debt, in either of the aforementioned cases, is thus used strategically by each government to influence the choices of its successors.

Roubini and Sachs' (1989) study on the determinants of fiscal deficit in industrial democracies shows that coalition governments in the OECD increase the fiscal deficit. This is even more likely the case when these governments have short tenures. Perotti and Kontopoulos (2002) state that fragmented governments and larger cabinets are positively associated with the growth of expenditure and of deficit. Studying fiscal deficit in developing countries, Roubini (1991) similarly concludes that the frequency of change of government increases the fiscal deficit. De Haan and Sturm (1994) found the same result for the European Community in the 1980s. Furthermore, Agnello and Sousa (2009), extending the discussion of the influence of political instability on fiscal deficit, in a study of 125 countries from 1980 to 2006 show that political factors including cabinet changes and government crisis among other economic variables, increase the fiscal deficit while the polity scale (a measure of democracy) decreases the fiscal deficit¹³.

Alesina and Perotti (1996) posit two approaches to the definition of political instability. The first approach defines political instability as the 'propensity to observe government changes'. These changes could be 'constitutional', and thus taking place within the law, or 'unconstitutional', through coups d'état. The second approach, on the other hand, relies upon indicators of social unrest and political violence. Alesina and Perotti (1996) argue that high levels of social unrest, widespread violence and political disorder disrupt market activities. The adverse effects these have on productivity may affect investment in much the same way as a high propensity for government change affects investment by creating policy uncertainty. In addition, high levels of social unrest and political violence, as evident in the frequency of coups and violence against politicians, might shorten the horizon of politicians. The shortened time horizon, according to Collier (2006), reduces the value of reputation and, thus, government, with hopes of making short-term gains, spends more on the military by accumulating debt. Hence, if a government is uncertain of its tenure or foresees that it has a short tenure and has little chances of being re-elected, it will tend to run a deficit.

With regard to a conflict/war situation, Steiner (2013) argues that the wars and peacekeeping operations generate transitory and unforeseen costs. Consequently, smooth tax rates, of the kind suggested by Barro (1979), would imply that these unusual expenditures generate deficits, which must

¹³ A recent paper by Hayo and Neumeier (2016) argues that the socioeconomic status of political decision-makers is an important determinant of fiscal deficit. They (Hayo and Neumeier, 2016) conclude for a panel of 21 OECD countries from 1980 to 2008 that tenures of leaders of lower socioeconomic status are characterized by higher deficit-to-GDP ratios than tenures of upper-class leaders. This thread of analysis on fiscal deficit is not followed in this research due to a lack of credible data on the subject in African countries.

be financed in future periods. A study carried out by Brück (1997) on the macroeconomic effects of the war in Mozambique concludes that increases in the fiscal deficit, uncertainty and transactions inefficiency severely damage to the long-term development potential of a post-war economy. Similarly, Imai and Weinstein (2000) conclude that civil wars have negative impacts on economic growth and domestic investment, particularly private domestic investment. However, contrary to the position of Brück (1997), Imai and Weinstein (2000) conclude that civil wars do not have a significant impact on the fiscal balance, and, as a result, the fiscal deficit is not increased.

4.3 An overview of the economies under study

Many of the conflict-affected countries in this study are highly resource-dependent economies, which, according to Collier (2006), makes them prone to conflict. Hydrocarbons account for significantly large proportions of economic activity in countries like Algeria, where hydrocarbons account for about two-thirds of GDP and 98% of exports. Hydrocarbons also account for over 60% of the GDP of Congo Republic and 90% of Nigeria's exports. Angola, Chad, and Libya are also highly dependent on hydrocarbons. Burundi, Cote d'Ivoire, Morocco, and Rwanda are largely agrarian, and, until 2003, Chad was also largely agrarian. The economy of the Democratic Republic of Congo is largely dependent on minerals and precious metals while Guinea and Sierra Leone depend largely on the export of iron ore. Services account for 55 – 60% of Namibia's GDP.

Government final consumption expenditure as a proportion of GDP in Burundi rose from an average of 9% in the 1980s to 17% in the 1990s and 21% in the 2000s, with a peak of 32% in 2010 and then a decline to 22% in 2013. The rise was relatively slower in Morocco. In Chad, there was a decline in government spending as a percentage of GDP from 11% in the 1980s to 8% in the 1990s, 6% in the 2000s, and 7% in 2012, with a rise to 8% in 2013. A similar decline occurred in Cote d'Ivoire. Angola and Lesotho consistently had decade average government spending above 20% of GDP, although the rates for Angola were declining and reached 20% in 2013. The Democratic Republic of Congo, on the other hand, had rates below 10% except for the 1990s and the year 2013. Expenditures in Cameroon were consistently about 10% of GDP with a slight rise to 12% in 2013.

Table 4-1 – General government final consumption expenditure, Revenue excluding grants and social contributions and General government net lending/borrowing (decade average, percentage of GDP)

	General government final consumption expenditure				Revenue excluding grants and social contributions				General government net lending/borrowing			
	1980-1989	1990-1999	2000-2009	2012	1980-1989	1990-1999	2000-2009	2012	1980-1989	1990-1999	2000-2009	2012
Algeria	17.2	16.6	13.6	20.8	34.5	29.8	38.8	39.7	n.a.	0.2	6.2	-4.1
Angola	46.7	41.5	23	21.2	31.4	31.8	41.6	44.9	n.a.	n.a.	1.3	4.6
Burkina Faso	15.6	22.5	21.6	20.8	9.4	11.6	12.6	17.5	0.2	-1.7	-2.3	-3.1
Burundi	9.3	17	20.8	24.2	11.6	13.4	14.6	14.5	n.a.	-3	-3	-3.7
Cameroon	10	10.6	10.2	11.5	18.4	12.6	17.5	17.3	n.a.	n.a.	4.8	-1.6
Central African Republic	15.7	14.9	10.3	7.4	12.5	8.9	9.4	10.9	-5.6	-3	-0.5	0
Chad	11.3	8.1	6.4	6.9	4.5	6.2	11	21.8	n.a.	-3.7	-2.5	0.5
Comoros	28.6	20.3	14.3	25.3	13.4	13.7	13.5	19.3	-5.8	-3.8	-2.1	3.3
Congo, Dem. Rep.	9	10.6	6.7	12.7	9.3	2.6	6.6	14.9	n.a.	-1.7	-0.9	1.8
Congo, Rep.	17.7	21.2	14.4	14.6	38.7	24.9	34.1	42.5	n.a.	-6.4	8	6.4
Cote d'Ivoire	16.5	14.2	13.3	14.7	27.7	17.4	15.8	n.a.	n.a.	-2.3	-0.9	-3.1
Djibouti	n.a.	31.8	28	n.a.	32.9	26.9	27.9	29.2	n.a.	-6.4	-2	-2.6
Egypt, Arab Rep.	16.2	10.9	11.9	11.4	18.7	23.6	22.1	18.6	n.a.	n.a.	-8.6	-10.5
Eritrea	n.a.	39.7	35.4	n.a.	n.a.	30.8	22.3	n.a.	n.a.	-12.3	-21.3	n.a.
Ethiopia	14.3	12.9	16.3	8.3	12.6	11.4	11.1	n.a.	-3.9	-4.7	-4.2	-1.2
Gambia, The	29.1	12.1	9	7.5	16.7	13.7	14.1	16.4	n.a.	n.a.	-3	-4.4
Ghana	9	11.7	11.5	20.9	8.5	10.9	13.4	16.8	-3.9	-7.5	-5.1	-12.2
Guinea	11.6	8.2	8	9.5	9.3	12	13.2	20.1	n.a.	-3.2	-3.3	-3.3
Guinea-Bissau	18.9	8.4	15	12.2	n.a.	6.6	9	9.4	n.a.	n.a.	-3.3	n.a.
Kenya	18.3	15.8	16.1	13.9	13.7	16.6	17.1	17.6	-2.9	-3.6	-2	-5
Lesotho	20.8	32.3	36.3	37.6	37.6	49.3	53.7	60.5	-6.8	4.4	3.5	5.1
Liberia	24.3	n.a.	10.2	15.5	23.9	13.9	14.3	24.7	n.a.	n.a.	0.5	-1.6
Libya	n.a.	24	13.6	n.a.	34	30.6	54.7	72.3	n.a.	2	15.3	27.8
Mali	12.3	12.7	11	11.3	13.3	13.5	16.4	16.4	n.a.	n.a.	0.5	-1.1
Mauritania	30.6	14.8	23.7	19.6	18.5	18.6	21.2	27.7	n.a.	n.a.	-2.5	2.5
Morocco	18.3	17.5	18.4	19.2	18.6	23.1	27.8	30.1	n.a.	-0.5	-2.9	-7.4
Mozambique	13.8	9.7	12.3	21.5	11.7	9.9	12.1	n.a.	-7.3	-2.6	-3.4	-3.9
Niger	11.9	15	14.7	13.2	11.2	8.4	12.3	15.9	n.a.	-3.5	1.7	-1.2
Nigeria	11.6	9.6	8.4	8.2	n.a.	22.1	23.5	14.3	n.a.	n.a.	1.8	0.3
Rwanda	13	11.8	14.6	14.4	11.5	9.4	11.9	n.a.	n.a.	-6.3	-0.3	-1.6
Senegal	19.3	15	13.4	16.7	16	16.2	18.6	20.2	n.a.	n.a.	-2.8	n.a.
Sierra Leone	7.7	9.6	11.3	10.3	4.6	6.2	8.8	11.4	n.a.	n.a.	-0.9	-5.2
South Africa	17.4	19.3	18.8	19.9	27.3	31.4	32.6	33.6	n.a.	n.a.	-1	-4.1
Sudan	11.1	6.1	12.4	8.7	10.8	7.5	17.3	9.5	n.a.	-7.9	-1.3	-3.3
Togo	16.9	12.8	10.3	12.7	28.6	12.9	15.5	18.2	-3.4	-5.2	-1.5	-7.2
Tunisia	16.5	16.2	16.7	18.4	n.a.	23.1	22.1	23.1	n.a.	-3.2	-2.2	-5.3
Uganda	9.9	11.1	13.9	8.2	5.2	7.7	9.7	10.9	n.a.	1.1	-1.1	-3

Source: World Bank. (2015, September). World Development Index.

Fiscal deficit as a percentage of GDP for all countries under investigation was, on the average, on a declining trend. Except for 2002, Congo Republic had fiscal surpluses from 2000 to 2012. This was the case in Libya as well, when the country had fiscal surpluses from 1999 until 2012, except for 2011, when there was a nine-month war that culminated in the toppling of the Muammar Gaddafi government and the government changing hands four times. Nigeria also had fiscal surpluses for most of the years between 2000 and 2012. The economies of these countries, which are oil-exporting countries, benefitted from the rise in international oil prices. In Libya, where hydrocarbons account for 65% of GDP and 96% of revenue, the 2011 Libyan Civil War led to a near-total disruption of hydrocarbon exports and a subsequent 62% decline of real GDP (International Monetary Fund, 2013). Although Ethiopia has consistently had fiscal deficits since 1980, its deficit was also on a declining trend between 2000 and 2012. The GDP grew at an annual average of 11% between 2004 and 2012 through an expansion of the services and agricultural sectors.

To the contrary, Egypt had fiscal deficits from 1996 until 2012, and, in most cases, the deficit was rising. In 2011, when President Hosni Mubarak resigned and the government was changed three times, the fiscal deficit increased by 30%. Similarly, Morocco had fiscal deficits between 2000 and 2012, except for 2008, and the deficits were consistently rising between 2009 and 2012. The average fiscal deficit as a percentage of GDP for Burundi was slightly below 3% in the 1990s and 2000s, while it was slightly above 3% between 1993 and 2003 during the Second Burundi War, Africa's World War, and the Third Burundi War.

4.4 Political instability and fiscal deficit

A pattern is noticeable in the relationship between political instability and fiscal deficit in some countries under study. In Algeria, there were three changes of government in 1992. The subsequent years from 1993 – 1995 each experienced one change of government. At the same time, Algeria was at war with the Algerian Islamic Front from February 1992 until June 1999. Between 1990 and 1991, Algeria had annual budget surpluses of 3% and 4% of GDP, respectively. However, by 1992, when the war began and the government changed three times, the surplus had declined to 0.8% of GDP, and in 1993, the country had a fiscal deficit of 6% of GDP. The budget returned to a surplus position in 1995 and remained so until 1997. However, with the change in government in 1998, during the war with the Algerian Islamic Front, the budget reverted to a deficit of 4% before declining to 2% of GDP in 1999 when the war ended. By the year 2000, the fiscal deficit declined sharply and there was a fiscal surplus of 10% of GDP. The surplus continued until 2009.

Libya, like Algeria, had fiscal surpluses for most of the years between 1990 and 2012. Between 1999 and 2008, Libya maintained fiscal surpluses following the suspension of the United Nations Security Council sanctions in 1999, and with the eventual lifting of the sanctions on September 12,

2003, the surpluses grew even more between 2004 and 2008 (“Security Council lifts sanctions”, 2003). However, following the start of the ‘Arab Spring’ in 2011, there were nine months of war. This resulted in four changes of government, the first of which was the toppling of Muammar Gaddafi’s government. In the same year (2011), Libya had the second fiscal deficit (7% of GDP) between 1999 and 2012.

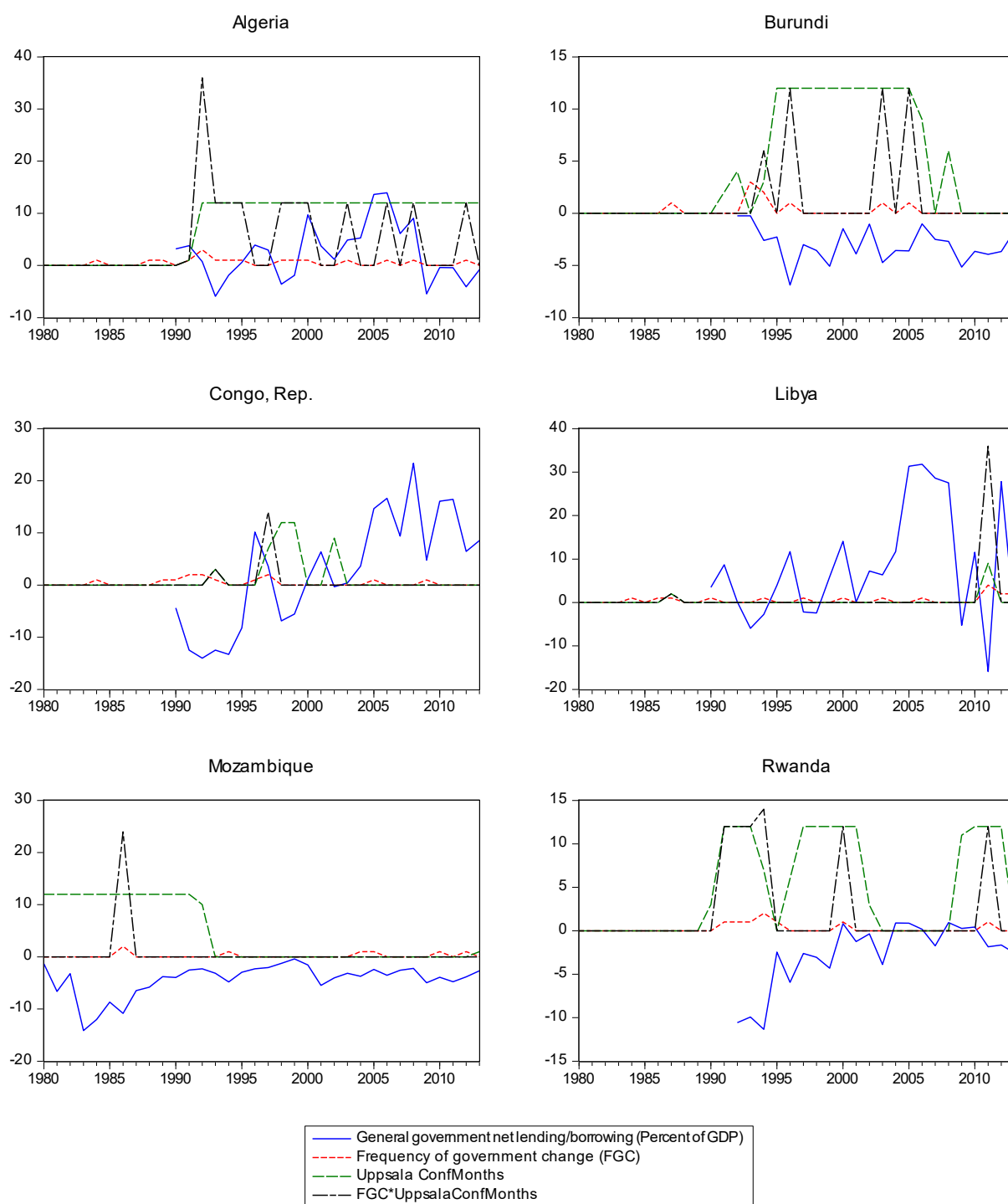
On the other hand, Burundi and Mozambique consistently had fiscal deficits between 1990 and 2012. In Burundi, between October 1993 and October 2003, while the Second Burundi War, Africa’s ‘World War’ and the Third Burundi War lasted, there were three changes of government in 1993, two in 1994, and one in 1996. The fiscal deficit sharply increased from 2% of GDP in 1995 to 7% in 1996. In the same year (1996), there was a change in government while there was also conflict. There was another increase in the fiscal deficit from 1% of GDP in 2002 to 5% of GDP in 2003 before the fiscal deficit dropped to about 4% of GDP in 2004 and 2005. There had been a change in government in 2003 during the Third Burundi War.

In the case of Mozambique, the Mozambique War lasted from October 1979 to October 1992. During this period, there were spikes in the fiscal deficit in 1983 and 1986. The spike in 1986 coincided with two changes of government in the same year. Post-war, spikes in the level of fiscal deficit in 1994 and 2004 coincided with changes of government in the respective years. Furthermore, while the average annual fiscal deficit between 1980 and 1992 was 7% of GDP, it was 4% of GDP post-war (between 1993 and 2012).

Rwanda had at least one change of government every year between 1991 and 1995, and there were two changes of government in 1994 alone. There was a four-month war, the Second Rwanda War, which led to the Rwanda Genocide, between April and July of 1994, and further conflict between March 1997 and July 2002 (the Third Rwanda War, Africa’s World War, and the Fourth Rwanda War). The fiscal deficit increased sharply in 1994. However, in 2000, despite the continuation of war and a change in government, Rwanda had a fiscal surplus of 0.8% of GDP. In the post-war period, all the years between 2004 and 2010, except 2007, had fiscal surpluses. This was also a period of sustained political stability. However, in 2011, there was another spike in the fiscal deficit, which coincided with a change of government.

While changes in government and the duration of war seemed to increase the level of fiscal deficit, government changes during wartime tended to be accompanied by spikes in fiscal deficit. This pattern was observed in Mozambique in 1986, in Burundi in 1996 and 2003, and in Libya in 2011.

Fig.4- 1 – Political instability and fiscal deficit (1980 – 2013)



Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallenstein. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015, 1946 – 2014.

4.5 Empirical analysis

4.5.1 Data

This study made use of data from 1980 to 2013 for 37 countries in Africa. The data on economic variables was sourced from the Government Financial Statistics (GFS) and World Economic Outlook (WEO) by the International Monetary Fund (IMF) and the World Development Indicators by the World Bank¹⁴. The data on conflict was retrieved from the Uppsala Conflict Data Program/ Centre for the Study of Civil Wars, Peace Research Institute Oslo (UCDP/PRIO) Armed Conflict Dataset, Version 4-2015.

Keynesian theory and Monetarist theory hold that bond-financed fiscal deficits raise interest rates (Alesina et al. 2002; Chakraborty & Chakraborty 2006). Monetarist theory further posits that, with regard to the demand for money, where the rate of interest is high, individuals prefer to invest in bonds rather than hold money. When a fiscal deficit is financed through debt instruments drawn on a central bank, the inability of government to repay the debt may force the central bank to monetize the debt, thereby increasing the supply of money in the economy, and consequently increasing demand for goods. This can raise the rate of inflation. Roubini (1991) finds that fiscal deficit and high seigniorage are highly correlated. Furthermore, Collier, Adam and Davies (2011) find that seigniorage is high during wartime and post-war, with government taxing the banking system during war and printing money in the post-war period. To determine whether the capacity for seigniorage induces the government to increase the deficit, the lag of seigniorage ($\frac{\pi H}{Y}$, measured as the product of the rate of inflation and high-powered money (M2)) is included in the model. Where the domestic economy cannot meet the additional demand, the increased money supply raises domestic spending for imported foreign goods and assets (Okpanachi & Abimiku, 2007). This potentially leads to a deficit in the current account balance and a subsequent decline in the exchange rate, a situation Monacelli and Perotti (2007) referred to as the ‘twin-deficits’ (i.e. fiscal deficit and current account deficit). The lag of net exports (*NetExp*) is therefore included in the model to ascertain whether a trade surplus in the preceding year induces the government to increase spending.

To ascertain the influence of the level of economic activity on the level of fiscal deficit, the lag of the growth rate of the Gross Domestic Product (GDP) is included in the model. Higher GDP growth rates indicate increasing utilization of human and material resources and thus correlate with lower levels of unemployment. Because, according to Bayar and Smeets (2009), lower than optimal levels of economic activity resulting from the presence of high unemployment result in a lower tax potential and hence higher levels of fiscal deficit, higher growth rates of GDP are expected to be correlated with

¹⁴ There are no cyclically adjusted data in the database. The original data is used.

lower levels of fiscal deficit. Steiner's (2013) study of 24 industrialized countries between 1870 and 2009, and Murwirapachena, Maredza, and Choga's (2013) study on South Africa, also show that unemployment has a significant direct influence on fiscal deficit.

Foreign civilian aid (or grants), according to Brück (1997), may increase or decrease during war and these fluctuations may have positive or negative effects on the fiscal deficit. The variable *ForAid* is included in the model to determine whether foreign aid compensates for the loss of revenue resulting from lower economic activity during war and thus reduces the fiscal deficit.

The political instability variables in this paper are the frequency of government change in a year and the number of internal conflict months in a year. The frequency of government change (*FGC*) measures the number of times the government changes in a calendar year. The head of state and/or head of government is considered the government here. Roubini (1991) uses a similar measure for political instability – the frequency of government change. He (Roubini, 1991), however, distinguishes between regular and irregular (through military coups) changes of government and finds a direct and significant relationship between political instability and fiscal deficit for regular changes of government, but an inverse and nonsignificant relationship for irregular changes of government. Grilli, Masciandaro, Tabellini, Malinvaud, and Pagano (1991), however, argue that it would be wrong to use government durability as an index of political instability. They argue that a change in government does not result in a significant change in political leadership if the new government is supported by the same political party and/or is composed of members of the same group as the previous one. They thus construct an index for stability based on the average number of years between significant government changes (i.e. those that result in a transfer of power from one political party or leading group to another).

In addition to the 'frequency of government change' only measure, though, political instability, as Alesina and Perotti (1996) posit, could also be measured by the 'propensity to observe government changes', social unrest, and political violence, which they note may be evident through mass violence, civil wars, political disorder, and physical threats. Hence, the duration of internal conflict, denoted by *IntConfMonths*, was included in the measurement of political instability to indicate the period for which stable and regular economic activity cannot be sustained, resulting in reduced national income accruable from the affected area. It also indicates the period during which military spending is sustained by the government. For the purpose of this study, Type 3 ("internal armed conflict occurring between the government of a state and one or more internal opposition group(s) without intervention from other states") and Type 4 ("internationalized internal armed conflict occurring between the government of a state and one or more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides") conflicts in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 of Uppsala University, Sweden are used (Themnér, 2015). Furthermore, because the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 is presented in days, this study defines an **internal conflict**

month as a Type 3 and/or Type 4 conflict in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 that occurs within a period ranging from one day to one calendar month¹⁵.

Political instability is included in the model to determine the extent to which changes in government and the occurrence of violent conflict influence the fiscal deficit. The political stability view of fiscal deficit sees debt as a legacy that a government deliberately leaves behind to its successors. If the borrowing government does not expect to inherit the accumulated debt in the future because it is less likely to be re-elected, then it is more likely to run a fiscal deficit in the current period. Consequently, public debt is larger in countries with more frequent government changes from one political party or leading group to another (Grilli, Masciandaro, Tabellini, Malinvaud, & Pagano, 1991). According to Collier (2006), when a government is uncertain of its tenure, it tends to become less accountable to the public and it, therefore, spends more. Accordingly, if a government is uncertain of its tenure or foresees that it has a short tenure and little chance of being re-elected, it will tend to run a deficit. The occurrence of war significantly shortens the horizon of government.

4.5.2 Econometric model

The two-way fixed effects regression method and the system general method of moments (GMM) procedure (two-step estimation) developed by Arellano and Bover (1995) and Blundell and Bond (1998) are used. Fiscal surplus is the dependent variable, and general government net lending/borrowing is used as a proxy for fiscal surplus¹⁶. The independent variables are political instability (represented by two variables: the frequency of government change and internal conflict months), the lag of the growth rate of the real Gross Domestic Product (GDP), the lag of seigniorage, the lag of net exports, and foreign aid. For the regressors, the lags of the growth rate of the real GDP, seigniorage, and net exports are used to avoid endogeneity that may arise with the use of data for the current period in system GMM estimation. Endogenous variables are not used in order to not increase the number of instruments to an excessive level such that, as Roodman (2009:98) noted, the Hansen test ‘generates implausibly good p-values of 1.000’. One-year lags of the growth rate of real GDP, seigniorage, and net exports are used.

A two-way fixed effects regression model is specified as follows:

¹⁵ External conflict is not included in this research because the impact of such conflict on the performance of the domestic economy may not be clearly ascertained.

¹⁶ Although cyclically adjusted fiscal surplus can also be used, there are no cyclically adjusted fiscal data in the Government Financial Statistics by the International Monetary Fund. Therefore, I am constrained to use cyclically non-adjusted data.

$$D_{it} = \alpha_i + \beta_t + \gamma_1 FGC_{it} + \gamma_2 IntConfMonths_{it} + \gamma_3 RGDP_{it-1} + \gamma_4 \left(\frac{\pi H}{Y}\right)_{it-1} + \gamma_5 NetExp_{it-1} + \gamma_6 ForAid_{it} + \varepsilon_{it} \quad (1)^{17}$$

For $i = 1, \dots, N$, $t = 1, \dots, T$, where D_{it} is fiscal surplus for country i in year t . For political and conflict variables for the respective countries i in year t , FGC_{it} is the frequency of government change in a given year and $IntConfMonths_{it}$ is the number of internal conflict months in a year. For economic variables in a closed-economy model, $RGDP_{it-1}$ is the lag of the growth rate of real GDP, and $\left(\frac{\pi H}{Y}\right)_{it-1}$ is the lag of seigniorage (the product of inflation and high-powered money in circulation), while, for the open-economy model, $NetExp_{it-1}$ is the lag of net exports and $ForAid_{it}$ is grants (otherwise referred to as foreign aid). α_i is the country-specific effect that captures the characteristics unchanged through time; β_t is a set of year dummies, which captures the common business conditions across countries. ε_{it} is an i.i.d error term.

An estimation using a dynamic specification is also conducted. The generalized method of moments (GMM) developed by Arellano and Bond (1991) rids the model of any country-fixed effects, time-invariant country-specific variables, and endogeneity resulting from correlation between country-fixed effects and the regressors. Thus, through first differencing, country-fixed effects are removed and the model can be estimated by instrumental variables.

A limitation of the difference-GMM estimation, however, is that lagged variables become weak instruments for first-differences, especially if the variables are close to a random walk. Additionally, the difference-GMM has potential reverse causality problems. Furthermore, if the autoregressive parameters are too large or the ratio of the variance of the panel-level effect to the variance of idiosyncratic error is too large, the difference-GMM estimator can become unreliable (Blundell and Bond, 1998). Hence, the two-step system GMM estimator is used. The system GMM estimator uses additional moment conditions, thus setting additional restrictions on the initial conditions of the process generating the dependent variable. The system GMM estimation method assumes that there is no autocorrelation in the idiosyncratic errors. It also requires the initial condition that the panel-level effects be uncorrelated with the first difference of the first observation of the dependent variable (Arellano &

¹⁷ To check for nonlinearity of the model, squares of each of the political instability variables were included in the model consecutively ($D_{it} = \alpha_i + \beta_t + \gamma_1 FGC_{it} + \gamma_2 FGC_{it}^2 + \gamma_3 IntConfMonths_{it} + \gamma_4 RGDP_{it-1} + \gamma_5 \left(\frac{\pi H}{Y}\right)_{it-1} + \gamma_6 NetExp_{it-1} + \gamma_7 ForAid_{it} + \varepsilon_{it}$ and $D_{it} = \alpha_i + \beta_t + \gamma_1 FGC_{it} + \gamma_2 IntConfMonths_{it} + \gamma_3 IntConfMonths_{it}^2 + \gamma_4 RGDP_{it-1} + \gamma_5 \left(\frac{\pi H}{Y}\right)_{it-1} + \gamma_6 NetExp_{it-1} + \gamma_7 ForAid_{it} + \varepsilon_{it}$) and simultaneously ($D_{it} = \alpha_i + \beta_t + \gamma_1 FGC_{it} + \gamma_2 FGC_{it}^2 + \gamma_3 IntConfMonths_{it} + \gamma_4 IntConfMonths_{it}^2 + \gamma_5 RGDP_{it-1} + \gamma_6 \left(\frac{\pi H}{Y}\right)_{it-1} + \gamma_7 NetExp_{it-1} + \gamma_8 ForAid_{it} + \varepsilon_{it}$). None of the squared variables produced statistically significant results at the 5% level of significance. The same is true for the system GMM model in equation 2.

Bover, 1995; Blundell & Bond, 1998). In addition, robust standard errors were used for the estimation of the covariance matrix to avoid the bias of the GMM two-step standard errors.

One lag of the dependent variable (general government net lending/borrowing, (as a percentage of GDP)) is used, while a maximum of one lag of the dependent variable is used as an instrument.

The dynamic linear model using the same variables as two-way fixed effects regression model, but with a lag of the dependent variable, is specified as follows:

$$D_{it} = \alpha_i + \gamma_1 D_{it-1} + \gamma_2 FGC_{it} + \gamma_3 IntConfMonths_{it} + \gamma_4 RGDP_{it-1} + \gamma_5 \left(\frac{\pi H}{Y} \right)_{it-1} + \gamma_6 NetExp_{it-1} + \gamma_7 ForAid_{it} + \varepsilon_{it} \quad (2)$$

4.5.3 Empirical results

Table 4-2 – Two-Way Fixed Effects (Robust Standard Errors) Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), frequency of government change, internal conflict months, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
Frequency of government change (FGC)	-0.723 (0.380)	-0.767 (0.435)	-0.725 (0.461)	-0.687 (0.465)
Uppsala IntConfMonths	-0.131* (0.052)	-0.135* (0.056)	-0.140* (0.065)	-0.135* (0.066)
L.GDP growth (annual %)		-0.0397 (0.058)	-0.0663 (0.047)	-0.0664 (0.053)
L.Seigniorage ($\pi H/Y$)			0.0000273 (0.000)	0.0000915 (0.000)
L.Net exports (Export-Import) % of GDP				0.0580* (0.023)
Grants, excluding technical cooperation (BoP, % of GDP)				5.441 (4.168)
Constant	-0.783 (1.165)	-6.399*** (0.774)	-6.406*** (0.772)	-6.572*** (0.756)
r2	0.152	0.173	0.190	0.206
No. of observations	773	753	725	720
Residual degrees of freedom	36	36	36	36
No. of countries	37	37	37	37

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallenstein. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

The estimated coefficients of year dummies are not shown for the sake of brevity. The full result is shown in the Appendices (as Appendix 4-A1).

Table 4-2 presents the results of the two-way fixed effects regression estimation of the model. Columns 1 – 4 show that one variable of political instability (i.e. the duration of internal conflict) has an inverse relationship with the fiscal surplus, thus indicating that a rise in political instability results in

a decrease in the fiscal surplus (i.e. an increase in fiscal deficit). Similarly, the lag of the growth rate of GDP in Columns 2, 3, and 4 has an inverse, though statistically not significant, relationship with the fiscal surplus. The lag of net exports has a significant direct relationship with the fiscal surplus, and therefore an inverse relationship with the fiscal deficit.

For the time effects (shown in Appendix 4-A1), the results are significant for the years 1983 – 1986, 1988 – 1990, and 1995 – 2013. The year 1980 is excluded from the model.¹⁸

Table 4-3 – Two-Step (Robust Standard Errors) System GMM Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), frequency of government change, internal conflict months, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
L.General government net lending/borrowing (Percent of GDP)	0.321*** (0.075)	0.387*** (0.101)	0.400*** (0.097)	0.320*** (0.091)
Frequency of government change (FGC)	-0.243 (0.274)	-0.205 (0.306)	-0.207 (0.321)	-0.164 (0.333)
Uppsala IntConfMonths	-0.475** (0.183)	-0.415** (0.150)	-0.435* (0.171)	-0.414** (0.155)
L.GDP growth (annual %)		-0.178* (0.078)	-0.187* (0.078)	-0.177* (0.072)
L.Seigniorage ($\pi H/Y$)			-0.000569 (0.001)	-0.000186 (0.001)
L.Net exports (Export-Import) % of GDP				0.0629** (0.024)
Grants, excluding technical cooperation (BoP, % of GDP)				5.659 (7.664)
Constant	-0.0479 (0.677)	0.621 (0.935)	0.864 (1.030)	0.642 (1.595)
No. of observations	736	722	695	690
No. of countries	37	37	37	37
No. of instruments	67	68	69	71
Hansen (p-value)	0.9982	0.9990	0.9987	0.9994
AR1 (p-value)	0.0088	0.0053	0.0048	0.0056
AR2 (p-value)	0.1907	0.2442	0.1598	0.2146
AR3 (p-value)	0.3560	0.6247	0.3211	0.3061
Wald chi2	42.19	20.49	29.31	45.80
Chi2 (p-value)	0.0000	0.0004	0.0000	0.0000

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallenstein. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

¹⁸ A two-way one-step (robust standard errors) system GMM regression analysis with time effects from 1982 to 2013 was conducted. However, the results are not shown in the paper because, while the two-way one-step (robust standard errors) system GMM regression analysis produced a similar result to the two-way fixed effects (robust standard errors) regression analysis (shown in full in the Appendices as Appendix 4-A1), the Sargan-Hansen test for overidentifying restrictions (Arellano and Bond, 1991) showed a significant p-value of 0.0000, indicating that overidentifying restrictions are not valid. Similarly, a two-way two-step (robust standard errors) system GMM regression analysis was conducted, but the results are not shown here because the robust standard errors could not be computed.

Column 1 of the results of the two-step system GMM estimation in Table 4-3 shows a direct and significant relationship between fiscal deficit and the one-year lag of fiscal deficit. A higher fiscal deficit in the preceding year increases the deficit in the current year. In addition, greater political instability, measured by the duration of conflict, as was found in the two-way fixed effects regression estimation shown in Table 4-2, results in the decline of the fiscal surplus, and hence increases in the fiscal deficit.

With the inclusion of the lag of the growth rate of the GDP in Column 2, the relationship between fiscal deficit and its one-year lag, as well as its relationship with duration of conflict, remains the same as that in Column 1. The lag of the growth rate of the GDP also has a significant inverse relationship with the fiscal surplus, implying that, as the growth rate of the GDP in the preceding year rises, fiscal deficit increases. Hence, a faster economic growth rate in the preceding year is associated with an increase in the fiscal deficit. The result shows that there is an inducement in the governments to increase spending when the economy is believed to have grown at a faster rate in the preceding period. In conflict societies, where growth rates are low or often negative and hence tax potentials have declined, higher spending in the current period, induced by a higher growth rate of the economy in the preceding year and higher military spending, leads ultimately to higher fiscal deficit.

In Column 3, a one-year lag of seigniorage is included in a closed-economy model. The lag of fiscal deficit remains positive as shown in Columns 1 and 2. Similarly, the relationship between the fiscal deficit and the duration of conflict is maintained, as is the case for the relationship between the fiscal deficit and the growth rate of GDP. Although the lag of seigniorage – the product of the rate of inflation and the amount of high-powered money in circulation – has a negative sign, which would imply that greater seigniorage in the preceding year would have induced greater spending in the current year, just as the lag of the growth rate of the GDP does, its relationship with fiscal deficit in the current period is not significant.

The open-economy model in Column 4 includes the lag of net exports and grants (foreign aid). The lag of fiscal deficit, the duration of conflict, the lag of the growth rate of GDP, and seigniorage maintain the same relationships with fiscal deficit as were found in the preceding columns. The lag of net exports has a significant direct relationship with the fiscal surplus, implying that it reduces the fiscal deficit. From a contrary point of view then, the fact that the lag of net exports is directly related to the fiscal surplus also implies that a decline in the balance of trade in the preceding year increases the fiscal deficit.¹⁹

¹⁹ Controlling for the level of per capita income, the study analysed the countries based on their average per capita income for the period 1980 – 2013. The results found show a nonsignificant but direct relationship between the number of conflict months and fiscal deficit in countries with average per capita GDP of less than \$300 for the period. The relationship is, however, significant (and direct) for countries with average per capita GDP for the period of \$300 or more, and the results become more statistically significant at higher levels of per capita GDP.

Table 4-3A – Two-Step (Robust Standard Errors) System GMM Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), frequency of government change, internal conflict months (with regional interaction variables), lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
L.General government net lending/borrowing (Percent of GDP)	0.304*** (0.077)	0.369*** (0.104)	0.363*** (0.108)	0.327** (0.101)
Frequency of government change (FGC)	-0.225 (0.311)	-0.155 (0.362)	-0.0113 (0.355)	-0.239 (0.473)
Uppsala IntConfMonths	-0.236 (0.128)	-0.194 (0.259)	-0.168 (0.157)	-0.231 (0.289)
Interaction UppsIntConfM*CentralAfrica	0.0129 (0.193)	-0.0512 (0.318)	-0.0573 (0.220)	0.00934 (0.316)
Interaction UppsIntConfM*EastAfrica	-0.350 (0.370)	-0.404 (0.328)	-0.444 (0.399)	-0.362 (0.562)
Interaction UppsIntConfM*NorthAfrica	-0.996 (0.768)	-1.027* (0.478)	-1.029 (0.798)	-1.147* (0.467)
Interaction UppsIntConfM*SouthernAfrica	2.698 (6.554)	1.062 (7.697)	-2.996 (8.794)	28.31 (72.857)
L.GDP growth (annual %)		-0.177* (0.089)	-0.174* (0.077)	-0.170* (0.078)
L.Seigniorage ($\pi H/Y$)			-0.000329 (0.001)	0.0000761 (0.001)
L.Net exports (Export-Import) % of GDP				0.0666* (0.031)
Grants, excluding technical cooperation (BoP, % of GDP)				1.675 (10.331)
Constant	0.389 (0.802)	0.987 (0.991)	1.030 (1.249)	1.579 (1.811)
No. of observations	736	722	695	690
No. of countries	37	37	37	37
No. of instruments	71	72	73	75
Hansen (p-value)	0.9998	0.9998	0.9999	0.9999
AR1 (p-value)	0.0069	0.0047	0.0053	0.0029
AR2 (p-value)	0.2152	0.2887	0.1837	0.2282
AR3 (p-value)	0.4066	0.7459	0.3918	0.3825
Wald chi2	43.39	36.14	29.82	113.77
Chi2 (p-value)	0.0000	0.0000	0.0005	0.0000

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Central Africa: Angola, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., and Congo, Rep.

East Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Mozambique, Rwanda, and Uganda.

North Africa: Algeria, Egypt, Arab Rep., Libya, Morocco, Sudan, and Tunisia.

Southern Africa: Lesotho and South Africa.

West Africa: Burkina Faso, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

Being statistically nonsignificant, the results of the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991) for the respective columns satisfy the hypothesis that the instruments are valid instruments (that is, the instruments are uncorrelated with the error term) and the excluded instruments are correctly excluded from the estimated equation. On the other hand, the

These results are, however, not shown because the Sargan-Hansen test for overidentifying restrictions (Arellano and Bond, 1991) showed a p-value of unity (i.e. 1.0000).

significant Wald Chi-squared test results indicate that the explanatory variables in the model have a statistically significant effect on the model.

For the autoregressive (AR) processes, AR(1) being statistically significant is in line with expectations, indicating the presence of first-order serial correlation resulting from the inclusion of the lag of the dependent variable, fiscal surplus, in the model. Similarly, AR(2) and AR(3) being statistically nonsignificant is as expected, indicating the absence of second- and third-order autocorrelation.

Table 4-3B – Two-Step (Robust Standard Errors) System GMM Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), frequency of government change (with regional interaction variables), internal conflict months, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
L.General government net lending/borrowing (Percent of GDP)	0.316*** (0.078)	0.388*** (0.096)	0.392*** (0.091)	0.335*** (0.084)
Frequency of government change (FGC)	-0.671 (1.040)	-0.575 (2.056)	-1.079 (1.784)	-0.509 (2.071)
Interaction FGC*CentralAfrica	0.707 (1.558)	1.167 (3.015)	1.714 (2.560)	0.746 (3.132)
Interaction FGC*EastAfrica	-0.232 (1.802)	-0.213 (2.932)	0.667 (2.700)	-0.246 (3.519)
Interaction FGC*NorthAfrica	0.858 (1.565)	0.663 (3.312)	1.479 (3.135)	0.558 (3.343)
Interaction FGC*SouthernAfrica	4.775 (2.975)	4.266 (2.677)	4.937 (4.505)	5.585 (3.360)
Uppsala IntConfMonths	-0.466** (0.179)	-0.416* (0.172)	-0.421* (0.174)	-0.399* (0.180)
L.GDP growth (annual %)		-0.171* (0.085)	-0.183* (0.089)	-0.171* (0.081)
L.Seigniorage ($\pi H/Y$)			-0.000673 (0.001)	-0.000345 (0.001)
L.Net exports (Export-Import) % of GDP				0.0646* (0.032)
Grants, excluding technical cooperation (BoP, % of GDP)				-1.387 (6.770)
Constant	-0.189 (0.680)	0.633 (1.064)	0.768 (1.324)	1.425 (1.538)
No. of observations	736	722	695	690
No. of countries	37	37	37	37
No. of instruments	71	72	73	75
Hansen (p-value)	0.9994	0.9993	0.9995	1.0000
AR1 (p-value)	0.0108	0.0051	0.0054	0.0048
AR2 (p-value)	0.2216	0.2523	0.1878	0.2124
AR3 (p-value)	0.3808	0.6297	0.3375	0.3290
Wald chi2	49.50	59.90	30.04	26.01
Chi2 (p-value)	0.0000	0.0000	0.0004	0.0065

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Central Africa: Angola, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., and Congo, Rep.

East Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Mozambique, Rwanda, and Uganda.

North Africa: Algeria, Egypt, Arab Rep., Libya, Morocco, Sudan, and Tunisia.

Southern Africa: Lesotho and South Africa.

West Africa: Burkina Faso, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

The results of the analysis in Table 4-3A include interaction variables of internal conflict months and the respective five regions in Africa. The regions here are Central Africa, East Africa, North Africa, Southern Africa and West Africa (with West Africa represented by the main internal conflict months variable). The interaction variable for North Africa indicates a significant direct relationship between the duration of conflict and the fiscal deficit. Instances of political instability in two of the countries in that region, namely, Algeria and Libya, are shown in *Fig.4- 1* to negatively influence the fiscal balance. Interactions of the frequency of government change variable and the respective regions shown in Table 4-3B, however, do not have any significant relationships with fiscal deficit.²⁰

4.6 Summary and conclusion

This study researches the determinants of fiscal deficit in conflict-affected states in Africa. The review of literature indicates two broad approaches to the determination of the fiscal deficit: namely, the normative approach and the positive approach. The normative approach posits that fiscal deficit arises as a result of the “tax-smoothing” decision of government. On the other hand, while the political structure/political instability point of view of the positive approach to the determination of the fiscal deficit posits that fiscal deficit arises as a result of the political decisions of the incumbent, which are aimed at influencing the spending behaviour of the successor in an unstable and/or polarized political system, the conflict/war point of view considers the influence of the occurrence of conflict or wars on the fiscal deficit. From this point of view, the decline in economic productivity resulting from a conflict situation and the consequent decline in the tax potential of the economy, at a time when military and relief spending has increased and expenditures on economic and social services need to be maintained, results in a decline of the fiscal balance.

Using data from a panel of 37 countries where there were occurrences of conflict in the period between 1980 and 2013, the study shows that a pattern of relationship exists between fiscal deficit and political instability: government changes during times of conflict are accompanied by a steep rise in the fiscal deficit. This pattern of relationship is demonstrated for Burundi, Libya, and Mozambique, among other countries. Conflicts that do, or potentially, result in a change in government generate a heightened

²⁰ A modification of the models used in the preceding analyses uses the Political Stability and Absence of Violence/Terrorism Estimate in the World Governance Indicators of the World Bank in place of the two political instability variables (frequency of government change and conflict months) used in the paper, for the period 1996 to 2013. The results of the analyses are shown in the Appendices as Appendix 4-B1 – Appendix 4-B5. The results show that greater political stability increases the fiscal surplus (i.e. reduces the fiscal deficit). This relationship is significant in Appendix 4-B1 and Appendix 4-B2. However, unlike the case in which the interaction of the conflict months and the regional variables significantly increases fiscal deficit for the North African region, the results in Appendix 4-B5 show that the interaction of the Political Stability and Absence of Violence/Terrorism Estimate and the regional variables has an inverse, albeit nonsignificant, relationship for the same region. The results also indicate that greater political stability significantly increases fiscal deficit in Central Africa, contrary to expectation.

risk of the government falling, and thus shorten the horizon of the incumbent, who, as a consequence, increases spending on the military to maintain their hold of power. This has the potential of increasing the fiscal deficit.

Furthermore, using the two-way fixed effects estimation method and the system-GMM estimation method, the study finds that political instability, when measured by the number of internal conflict months, significantly increases the fiscal deficit. This result is found to be especially true for the North African region. However, the study does not find a statistically significant relationship between the other measure of political instability (i.e. the frequency of government change) and fiscal deficit.

The study, therefore, concludes that political instability, particularly the occurrence of war, leads to a higher fiscal deficit. Longer durations of conflict have a positive influence on the fiscal deficit.

The results of this study confirm previous studies on the conflict/war point of view of the positive approach to the determination of the fiscal deficit, which concluded that the occurrence of conflict increased the fiscal deficit. The results, however, fail to confirm the results of studies, including theoretical propositions, which claim that frequent changes of government increase the fiscal deficit.

It has been noted that the high natural resource dependence of many of the countries considered in this study predisposes them to greater risks of conflict, with the attendant negative consequences of conflict on economic activity, which, in turn, adversely affects government revenue generation. Additionally, the volatility of the prices of these resources brings about fluctuations in the national income. Given these circumstances, where government desires to smooth taxes over time, the tendency towards fiscal deficit is increased. Furthermore, the failure to diversify the economies of these countries, possibly arising from the desire of the incumbents to limit political competition, and hence ensure their continued rule, may indeed predispose these countries to greater political instability and, in a circular manner, result in a higher fiscal deficit.

Further research is, therefore, required regarding the raising of non-resource tax revenue, which implies diversifying the government revenue base, and the resulting impact of this on political stability and on private investments, which would, in turn, affect future economic growth. Furthermore, research on the impact of the occurrence of conflict and the resulting fiscal deficit on other economic variables, including the current account balance, would be an interesting endeavour.

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CHAPTER FIVE

POLITICAL INSTABILITY AND ECONOMIC GROWTH IN AFRICA

Abstract

Political instability, especially when it is of a violent nature, diminishes the productive, as well as the transactional capacities of the economy. This has adverse consequences for investment and thus future economic growth, a situation which in turn creates a fragile socio-political environment. The relationship between political instability and economic growth flows in either direction; political instability-affecting-economic growth (**PI**→**EG**) and economic growth-affecting-political instability (**EG**→**PI**). From the **PI**→**EG** point of view, political instability influences the latter through a number of channels including the tax system, government spending and fiscal deficit, and inflation, all of which affect the level of investment, and thus influence future economic growth rates. From the **EG**→**PI** point of view, low economic growth rates create conditions favourable for political instability. Reviewing economic and political stability data from 52 African countries for the period 1980 to 2013, the analysis demonstrates through some scenarios that higher and relatively more stable long-term (1980-2013) average growth rates correlate directly with political stability in most of the pairwise comparisons of the countries. This is shown to be especially true for less resource-dependent countries. Empirical analyses of the data comprising all the countries under investigation find there to be a strong bi-directional direct relationship between political stability and the level of growth, and it is even more so the case for conflict-affected countries, unlike the non-conflict-affected countries. Further analyses using three-year averages of the data from 1981 to 2013 find that greater fluctuations in the growth rate adversely affect the level of political stability in especially conflict-affected countries, thus indicating a correlation between economic instability and political instability.

Keywords: Political instability; economic growth; Africa

JEL Classification Code: H56, O47, 055

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5.1 Introduction

Many nations on the African continent have performed poorly in maintaining stable economic growth rates and achieving appreciable levels of economic development. This is despite the abundance of human and material resources that should engender positive economic outcomes for most of the population. To the contrary, many of these countries suffer from abysmally poor levels of development of both human and material resources, with many instances of social discontent and conflict, which further aggravate the state of underdevelopment.

Political instability, especially of a violent nature, destroys the productive capacity of the economy through its adverse impact on human and material resources. Besides, the transactional inefficiencies that result damage the economic prospects further (Brück, 1997), leading to lower investments. There is, consequently, an expectation that the level of economic growth will decline in the future. Furthermore, because political instability, in general, is likely to shorten the horizon of policymakers, there is a greater likelihood towards suboptimal short-term macroeconomic policies and frequent switch of policies that create volatility and thus, negatively affect macroeconomic performance (Aisen & Veiga, 2013).

The literature on the relationship between political instability and economic growth show that this relationship flows in either direction; that is, political instability influences the level of economic growth (**PI**→**EG**), on the one hand (Persson & Svensson, 1989; Cukierman et al, 1992; Alesina & Tabellini, 1990; Devereux & Wen, 1998)), while the level of economic growth influences the level of political instability (**EG**→**PI**), on the other (Londregan & Poole, 1990)). Additionally, the literature suggest that this relationship flows through other connecting variables such as the level of inflation, fiscal deficits and investment.

This analysis on the relationship between political instability and economic growth in Africa considers the nature of this phenomenon on the African continent. Being a continent where there have been significant levels of political instability, and where also there is widespread underdevelopment, the African continent presents an important location for the analysis of the relationship between political instability and economic growth. The analysis covers 52 out of the 54 countries in Africa for the period 1980 to 2013.

The analysis, by applying both static and dynamic methods in ascertaining the relationship, shall seek to determine the how political instability interacts with the level of economic growth. In addition, seeing the unstable performance of economies on the continent, the analysis shall further seek to determine if and what manner of relationship exists between political instability and instability in the economy.

5.2 Literature review

The relationship between political instability and economic growth flows in either direction; political instability-affecting-economic growth (**PI**→**EG**) and economic growth-affecting-political instability (**EG**→**PI**). The literature that pertains to this relationship have widely reported an inverse relationship between political instability and economic growth. One strand of the literature from the **PI**→**EG** point of view considers the relationship as flowing through the tax system. This strand considers the design of the tax structure as being based on strategic political considerations (Cukierman et al, 1992). The incumbent government in a politically unstable environment imposes tax on capital, for example, to discourage investment. Additionally, the incumbent increases the level of spending so much that the level of deficit is increased to constrain the fiscal policies of future governments. Because of these political decisions, there is a decline in the future economic growth rates (Persson & Svensson, 1989; Alesina & Tabellini, 1990; Devereux & Wen, 1998).

The influence political instability has on investment, however, does not arise from political decisions alone. Empirical studies have found a significant link between the policy uncertainty that arises from political instability and the level of investment. The studies have shown that investments decline with uncertainty in policies when an “outsider” gets into office or it is imminent that an incumbent would fall (Feng, 2001; An et al, 2016; Jens, 2017). This is so because a new government, unlike a re-elected government, brings with it new or, at least, different policies. The uncertainty about how the new policy directions would affect the economy or certain sectors within it influences investment decisions. This is especially the case when the investment is irreversible, as in the case of sector-specific capital investment, and/or when the investment can be delayed (Pindyck, 1991). Investors thus exit the economy in preference for politically stable environments with less policy uncertainty (Alesina et al, 1996). Moreover, a decline in investment may arise from political instability not only because of the uncertainty created, but may also be the result of a reduction in the return to capital arising from the inhibition of efficient capital allocation caused by political instability (Fielding, 2002).

An alternative channel through which political instability leads to lower economic growth is inflation. Weak governments, which are especially characteristic of politically unstable environments, are unable to resist the demand for increased spending, either for patronage or for suppressing dissent. Having ineffective tax systems that generate sufficient tax revenues, the increased government spending is financed by seigniorage – the inflation tax – when revenue from other sources is limited. The increased government spending is inflationary (Cukierman et al, 1992; Aisen & Veiga, 2005).

Acemoglu, Johnson and Thaicharoen (2003) argue that large budget deficits and high inflation are an indication of weak institutions. It is the weak institutions, which bring about distortionary macroeconomic policies that result not only in slower growth over the long run but also in greater

volatility and worse macroeconomic outcomes. Acemoglu et al (2003) further argue that countries that experience high volatility and economic crises are more likely to have inherited more extractive institutions from their colonial past.

These countries, having weak institutions and thus dysfunctional tax systems, depend substantially on extractions from natural resources, especially when they are resource-rich. The result is a rentier state, which is yet another link in the political instability-economic growth nexus. The concentration of economic power in the government, which is common in rentier states, makes the possession of political power highly lucrative and thus attracts human and material resources into the contest for political power. This transfer of resources and skills away from productive employment into the contest for political power represents a significant loss of productive capacity, which results in a decline in economic productivity. This scenario is commonly referred to in the literature as the “resource curse” (Karl, 1997; Caselli & Cunningham, 2009; Deacon & Rode, 2012; Bjorvatn & Farzanegan, 2015). In summary, what we have is a connection between political instability, which results from having rentier states with extractive institutions, and lower economic growth, which results from the transfer of resources away from productive ventures occasioned by the rentier situation. Thus, while being resource-rich creates the tendency towards a rentier system that leads to greater political instability, political instability, in turn, weakens administrative structures that are required for efficient tax administration, which leads to dependence on resource rents, with the attendant consequences of the resource curse.

Beside strategic political considerations and beyond political instability arising from the turnover of government, political instability of a violent nature, has been widely reported to also negatively affect the level of economic growth. The channel through which this occurs is the destruction of human and material resources that are required for sustaining economic productivity. Since wars are intrinsically destructive of these resources, as well as, the transactional structures that sustain their productivity, the economic growth rate declines relative to what it would have been had the war not occurred (Brück, 1997). The decline in the growth rate is, however, reversed post-conflict as the conflict-affected countries tend to grow faster than the non-conflict-affected countries after hostilities have ended (Collier & Hoeffler, 2011).

From the contrary point of view, that is, low economic growth leading to political instability (**EG→PI**), the literature finds that poor economic performance creates vulnerabilities that increase the risks of political instability. Londregan and Poole (1990) find that the probability of government being overthrown is significantly influenced by the level of economic well-being. Consequently, coups are almost non-existent in developed countries because high levels of income and high rates of economic growth significantly inhibit coups. Because failure represents significant risks to the coup participants, Londregan and Poole (1990) add that the participants weight these costs and would, consequently

activate their plans only when they expect to succeed. A weak economic environment and high poverty rates create the conditions for the coup to succeed as popular dissatisfaction increases. Londregan and Poole (1990) find that poverty is a common denominator in all coups.

It can thus be deduced from the literature that there is a deep interconnection between economic growth and political instability. While investment and the rate of economic development is reduced by the uncertainty associated with an unstable political environment, poor economic performance, on the other hand, may lead to the government collapse and political unrest (Alesina et al, 1996).

5.3 Political instability and economic growth in Africa

Liberia had positive economic growth rates of up to 6% per annum for all, except 2 years (1973 and 1975) of the 1970s. However, following the coup d'état in 1980 in which the incumbent president was assassinated, Liberia consistently had negative growth rates until 1995. The deepest declines in economic growth within this period were in 1989, 1990, 1992, 1993, and 1994 when the GDP growth rates fell to -27%, -51%, -35%, -33% and -22%, respectively. 1989 also marks the year of the commencement of the First Liberian Civil War (1989-1997), which led to the assassination of the incumbent president in September 1990. The Liberia situation shows how a continuous decline in the level of economic activity starting from a situation of political instability led to even further political instability in the future. As a matter of fact, between 1980 and 2013, Liberia experienced more years with negative economic growth rates (18 years) than years with positive growth rates (16 years). All the positive GDP growth years occurred towards the end of the war and after the war had ended indicating a rebounding of the economy.

The number of positive economic growth years relative to the negative growth years appears to not be conclusively related the level of political instability, as can be seen in the situations in Kenya and Lesotho. Although both countries had 33 years each of positive economic growth out of the 34 years (1980-2013) covered in this analysis, Kenya is more politically unstable than Lesotho is. Looking further at the average (AV) economic growth rates over the period, as well as, the standard deviations (SD) of these growth rates, Lesotho had only a slightly higher average economic growth rate of 3.77% and even more slightly lower standard deviation of the growth rate at 2.31 in comparison to Kenya's 3.68% and 2.32, respectively, as shown in Table 5-1.

Table 5-1 – Political stability, GDP growth rate, total natural resource rents and total tax

S/ No	Country	Average Total natural rents (% of GDP) 1980-2013 (a)	Average total tax (% of GDP) 1980- 2013 (b)	Average Annual Total Natural Resource Rent-to-Total Tax (NRT) ratio 1980- 2013 (c)	Average Political Stability and Absence of Violence/ Terrorism: Estimate (PSE) 1996-2013 (d)	Average Frequency of government change (FGC) 1980- 2013 (e)	Average Uppsala Internal Conflict Months (ICM) 1980- 2013 (f)	Average GDP growth (AV) 1980- 2013 (g)	Standard deviation of GDP growth (SD) 1980- 2013 (h)	Average GDP growth- to-Standard deviation of GDP growth (AV-SD) ratio 1980- 2013 (i)=(g)/(h)
Group A: Total tax annually exceeds total natural resource rents on the average										
1	Benin	7.25	12.73	0.64	0.47	0.09	nc	4.09	2.90	1.41
2	Botswana	2.63	14.84	0.17	0.97	0.09	nc	6.85	4.69	1.46
3	Burkina Faso	9.66	9.96	0.94	-0.18	0.32	0.03	5.08	3.28	1.55
4	Cabo Verde	0.62	15.35	0.04	0.88	0.15	nc	7.05	4.87	1.45
5	Comoros	2.12	11.23	0.19	-0.33	0.41	0.06	2.41	3.22	0.75
6	Cote d'Ivoire	6.25	16.13	0.40	-1.47	0.32	0.85	1.37	4.00	0.34
7	Djibouti	1.03	23.54	0.05	-0.23	0.09	0.91	1.56	3.48	0.45
8	Eritrea	4.52	16.67	0.32	-0.81	0.03	4.32	3.82	6.33	0.60
9	Gambia, The	3.65	12.62	0.29	0.22	0.03	0.03	3.57	3.13	1.14
10	Ghana	10.15	10.58	0.93	-0.05	0.12	0.06	4.55	3.75	1.21
11	Kenya	4.31	13.80	0.32	-1.19	0.09	0.03	3.68	2.32	1.59
12	Lesotho	5.56	42.07	0.14	0.08	0.29	0.03	3.77	2.31	1.63
13	Madagascar	5.86	9.70	0.61	-0.23	0.47	nc	1.74	4.40	0.39
14	Malawi	9.10	14.55	0.66	-0.08	0.09	nc	3.44	5.07	0.68
15	Mali	6.99	10.93	0.45	-0.14	0.47	1.41	3.21	4.86	0.66
16	Mauritius	0.03	17.54	0.00	0.88	0.38	nc	4.47	3.26	1.37
17	Morocco	2.02	20.33	0.10	-0.37	0.26	3.50	4.19	4.42	0.95
18	Namibia	4.30	26.36	0.14	0.67	0.21	nc	3.39	2.93	1.16
19	Niger	8.65	9.14	0.93	-0.59	0.62	1.12	2.43	5.28	0.46
20	Rwanda	7.41	9.97	0.79	-0.89	0.24	4.76	4.76	11.86	0.40
	Sao Tome and									
21	Principe	1.31	9.91	0.10	0.42	0.68	nc	4.87	2.96	1.64
22	Senegal	3.33	15.79	0.21	-0.34	0.41	2.38	3.07	2.77	1.11
23	Seychelles	0.08	28.85	0.00	0.85	0.03	nc	3.34	5.23	0.64
24	South Africa	4.73	24.95	0.21	-0.14	0.18	3.18	2.44	2.34	1.04
25	Swaziland	5.03	23.79	0.28	-0.17	0.38	nc	4.88	4.85	1.01
26	Tanzania	6.51	8.59	0.85	-0.36	0.26	nc	5.13	2.20	2.33
27	Togo	9.01	14.48	0.65	-0.41	0.38	0.03	2.63	5.83	0.45
28	Tunisia	7.11	19.23	0.26	-0.02	0.29	0.03	4.18	2.38	1.75
29	Zambia	12.68	15.41	0.82	0.23	0.21	nc	3.70	4.13	0.90
30	Zimbabwe	6.61	20.80	0.66	-1.07	0.12	nc	1.82	7.66	0.24
Group B: Total natural resource rents annually exceed the total tax on the average										
31	Algeria	28.39	11.73	2.73	-1.39	0.50	7.79	2.79	2.33	1.20
32	Angola	39.01	6.48	7.89	-0.96	0.21	7.94	5.75	8.73	0.66
33	Burundi	19.40	12.23	1.61	-1.84	0.26	4.59	2.18	4.42	0.49
34	Cameroon	12.04	10.24	1.21	-0.56	0.24	0.03	2.82	4.86	0.58
	Central African									
35	Republic	9.54	9.00	1.08	-1.70	0.56	2.03	0.46	7.62	0.06
36	Chad	18.21	5.13	3.85	-1.47	0.56	7.88	5.89	8.88	0.66
	Congo, Dem.									
37	Rep.	23.74	5.63	9.84	-2.30	0.68	3.03	0.77	5.53	0.14
38	Congo, Rep.	54.64	10.34	6.14	-0.90	0.38	1.24	4.17	6.03	0.69
	Egypt, Arab									
39	Rep.	16.14	12.18	1.13	-0.75	0.47	2.03	4.78	2.08	2.30
	Equatorial									
40	Guinea	31.01	11.08	6.04	-0.01	0.24	nc	16.91	29.14	0.58
41	Ethiopia	17.78	8.60	2.10	-1.42	0.24	10.53	5.29	6.83	0.77
42	Gabon	42.72	11.16	3.95	0.27	0.24	nc	2.17	5.49	0.39
43	Guinea	16.26	7.88	3.34	-1.51	0.44	0.32	3.46	1.39	2.48
44	Guinea-Bissau	18.78	4.97	4.37	-0.80	0.74	0.35	2.35	7.40	0.32
45	Liberia	39.03	17.26	2.21	-1.36	0.29	1.65	3.31	26.22	0.13
46	Libya	30.66	5.66	13.57	-0.24	0.50	0.26	5.64	32.70	0.17
47	Mauritania	22.52	12.61	2.14	-0.35	0.47	0.41	3.36	4.33	0.78
48	Mozambique	12.54	10.17	1.26	0.17	0.21	4.56	4.82	6.10	0.79
49	Nigeria	38.87	4.68	9.55	-1.75	0.24	1.18	3.64	7.66	0.48
50	Sierra Leone	12.57	7.00	2.23	-0.70	0.24	3.79	2.94	8.00	0.37
51	Sudan	6.80	7.04	1.05	-2.25	0.09	10.82	4.46	4.70	0.95
52	Uganda	16.10	7.55	3.65	-1.18	0.29	10.97	6.80	3.14	2.17

Sources of raw data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, June). World Development Index; World Bank. (2016, April). World Governance Indicators

Notes: nc – Non-conflict.

Fig.5- 1 – Political stability, GDP growth rate, total natural resource rents and total tax

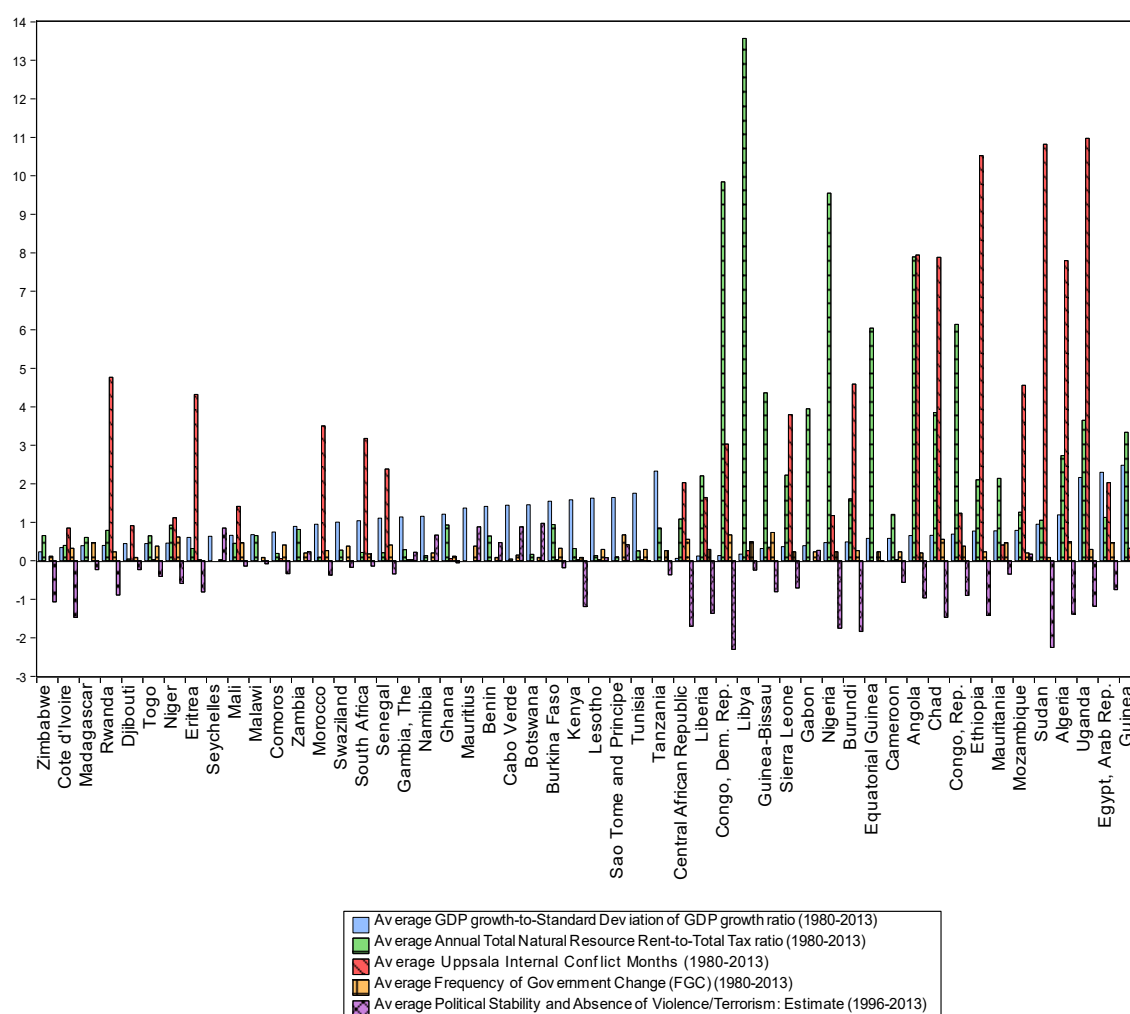


Figure created with Eviews 9.5

Two other countries with 33 years of positive economic growth rates are Botswana and Mauritius. Of the 33 years of positive economic growth in Botswana, only 10 of these years recorded growth rates below 5%, while 6 years recorded growth rates that were greater than 10%, annually. Unlike Botswana, however, 17 of the 33 years of positive economic growth in Mauritius recorded growth rates that were below 5%, while annual growth rates above 10% were not recorded in any of the years. Botswana, with a relatively higher average economic growth rate of 6.85% and higher standard deviation of the growth rate of 4.69, is noted in the literature for being a politically stable country (Wantchekon, 2002; Acemoglu, Johnson, & Robinson, 2003). Mauritius is similarly politically stable, having an average growth rate of 4.47% and standard deviation of 3.26. The average GDP growth-to-standard deviation of GDP growth (**AV-SD**) ratios for Botswana and Mauritius are, respectively, 1.46 and 1.37, which are close to Kenya's 1.59 and Lesotho's 1.63. All four countries, except Kenya, are relatively politically stable when assessed in relation to the Political Stability and Absence of Violence/Terrorism estimate (**PSE**) of the World Bank World Governance Indicators. Although, both

Kenya and Lesotho, unlike Botswana and Mauritius, experienced incidences of conflict, the duration of conflict²¹ in both cases was on the average very short, at about 0.03 month.

Looking further into how the relationship between the average GDP growth rate and the standard deviation of GDP growth rate relate to the level of political instability, we see a sort of pattern as shown in *Fig. 5-1*. In countries where on the average the total tax annually exceeds the total natural resource rents (Group A in Table 5-1), a higher **AV-SD** ratio on the average, indicating a faster and relatively stable economic growth, is associated with higher levels of political stability (that is, lower levels of political instability). The only exceptions to the rule in these countries, ranging from Zimbabwe to Tanzania on *Fig. 5-1*, are Kenya and Tanzania, where the **AV-SD** growth ratios are high but have quite high levels of political instability. Moreover, the duration of conflict in the countries where on the average the total tax annually exceeds the total natural resource rents, where it occurs, is relatively shorter the greater the **AV-SD** growth ratio. This may thus suggest that for these countries, the lower the level of political instability, the relatively more stable would be the rate of economic growth, as measured by the standard deviation of the GDP growth rate.

The picture regarding the **AV-SD** growth ratio and the level of political instability, however, seems to be unclear in countries where on the average the total natural resource rents annually exceed the total tax (Group B in Table 5-1). Here, political instability as measured by the Political Stability and Absence of Violence/Terrorism estimate (**PSE**) of the World Bank World Governance Indicators seems to be unrelated to the **AV-SD** growth ratio. However, converse to what was shown for the higher total tax countries, in these countries, ranging from the Central African Republic to Guinea in *Fig. 5-1*, longer durations of internal conflict are correlated with higher **AV-SD** growth ratios. Additionally, the annual total natural resource rent-to-total tax (**NRT**) ratio is inversely correlated with the **AV-SD** growth ratio, implying relatively less stable economic growth rates as the **NRT** ratio increases. The presence of relatively higher total natural resource rents thus leads to less stable economic growth rates. This would not be unconnected with the instability in prices of natural resources in international markets and suggests a transmission of the effects of instability in commodity prices to the stability in economic growth rates in resource-dependent economies.²²

²¹ The duration of conflict here is measured by Type 3 (*“internal armed conflict occurring between the government of a state and one or more internal opposition group(s) without intervention from other states”*) and Type 4 (*“internationalized internal armed conflict occurring between the government of a state and one or more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides”*) conflicts in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 of Uppsala University, Sweden (Themnér, 2015). Since the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 is presented in days, an **internal conflict month** is defined here as a Type 3 and/or Type 4 conflict in the UCDP/PRIO Armed Conflict Dataset, Version 4-2015 that occurs within a period ranging from one day to one calendar month. External conflict is not considered here because its impact on the domestic economy may not be certain.

²² *Fig. 5-1*, additionally, shows a greater density of negative-valued Average Political Stability and Absence of Violence/Terrorism estimate (**PSE**) bars in resource-dependent countries denoting higher levels of political instability on the average in these countries as compared to the less resource-dependent countries. There are

The average standard deviation of the economic growth rate in the 22 countries in the group where total natural resource rents exceed total tax is 8.8, with an average growth rate for the period of 4.3%. These are higher than the corresponding values in the 30 countries where the total tax exceeds the total natural resource rents, with the values being 4.22 and 3.71% for the standard deviation of the growth rate and average growth rate, respectively. The average standard deviation of the growth rate in countries where total natural resource rents exceed total tax being more than 2 times higher than that of countries where the total tax exceeds total natural resource rents, even though the average growth rate is only 1.15 times higher, suggests the influence natural resource rents have on economic growth rates either directly, through the fluctuations in commodity prices, or indirectly, through the greater tendency for political instability in resource-dependent countries and the resulting impact of political instability and war on the level of economic growth.

The foregoing analyses show that not only higher economic growth rates but also relatively more stable growth rates are correlated with higher levels of political stability (or lower levels of political instability) in less resource-dependent countries. Taking a ratio of the average economic growth rate to the standard deviation of the growth rate thus attaches greater value, and therefore greater importance, to stable growth, especially regarding its relationship with political stability. A higher **AV-SD** growth ratio would suggest not just a higher economic growth rate but also the added benefit of a higher level of political stability.

Parvin (1973) noted the importance of a growing income in determining the level of political stability. Since growing per capita incomes indicate the expanding capacity of the economy to meet the growing demands of the society, and therefore create a sense of individual and/or group fulfilment, the sense of disaffection felt by members of the society is removed or minimized. Moreover, Parvin (1973) additionally noted that a higher rate of income growth raised the present value of future incomes and therefore raises the level of current employment. This raises the opportunity cost of violence for the individual. Consequently, higher growth rates would coincide with lower levels of political instability because individuals would prefer to maintain their present and future economic status.

When growth rates fluctuate, however, a different effect on expectations is generated. Wide fluctuations in growth rates generate uncertainties about the state of the economy and, thus, adversely affect investments. The effect is that individuals' perceptions of their future prospects are negatively altered and it would be the case then that their present and future opportunity costs for engaging in violent acts and potentially losing their present economic status for a better one, should the outcome of engaging in violence be in their favour, will be lowered. The level of political instability would then rise. Despres et al (1950:507) relate the relationship between political instability and economic

similarly longer durations of conflict in the resource-dependent countries on the average than is the case in the less resource-dependent countries. Analyses of these relationships are outside the scope of this paper.

instability, which includes an unsteady growth in production, as well as, mass unemployment and major fluctuations in the price level (Despres et al, 1950:505), thus: “...marked economic instability creates conflicts and hardships, sets group against group and produces dissatisfaction with the existing structure of society.”

Three scenarios can be thought-up from the relationship between the growth of the economy, denoted by the average growth rate (**AV**), and stability in the growth of the economy, denoted by the standard deviation of the growth rate (**SD**), in relation to the level of political instability. The first is a scenario where any two countries have the same average growth rate but one of which has a lower standard deviation of the growth rate, thus giving it a higher **AV-SD** growth ratio. Such a country would have the advantage of a more stable political system in comparison to the other. For this scenario, we find that no two countries have the same average growth rates, so comparisons are made for countries whose average growth rate values are very close. Niger and South Africa have average long-term (1980-2013) growth rates of 2.43 and 2.44 respectively. South Africa, however, has a lower standard deviation of 2.34, giving it a higher **AV-SD** ratio of 1.04, compared to Niger’s standard deviation of the growth rate of 5.28 and **AV-SD** ratio of 0.46. South Africa is shown to be more politically stable than Niger, having an average Political Stability and Absence of Violence/Terrorism estimate (**PSE**) of -0.14, which is greater than Niger’s -0.59, as shown in the comparisons on Table 5-2. Similar outcomes are found for the comparisons between Tunisia and Morocco, and between Sao Tome and Principe and Swaziland, with the more politically stable country being the country having the lower standard deviation of the growth rate and, therefore, a higher **AV-SD** ratio, as underlined in Table 5-2. Regarding the other measures of political instability, the frequency of government change (**FGC**) seems not to be influential in the political stability-economic growth relationship in two of the three cases (that is, Tunisia-Morocco and Sao Tome and Principe-Swaziland) as the countries with the higher **FGCs** in these comparisons turned out to have higher **AV-SD** ratios. Regarding the duration of conflict, the non-occurrence of conflict or the shorter the duration of conflict in two of the three cases (that is, Tunisia-Morocco and Sao Tome and Principe-Swaziland) is shown to coincide with a higher **AV-SD** ratio. All the countries considered under Scenario 1 are in group A (that is, countries where total tax annually exceeds total natural resource rents on the average).

The second scenario is one where two countries have the same standard deviation of the growth rate but in which one country has a higher average growth rate, and thus also has a higher **AV-SD** growth ratio. Here, the risk of political instability reflected in the instability of the economic growth rate would be compensated for by the higher economic growth rate. We make comparisons here between Lesotho and Kenya, Swaziland and Mali, and Mali and Cabo Verde. In all but the Swaziland-Mali cases, relatively higher average economic growth rates, and, therefore, higher **AV-SD** ratios coincide with higher levels of political stability. Moreover, except for the Lesotho-Kenya case, a lower

FGC and the non-occurrence of conflict coincide with a higher **AV-SD** ratio. Like the first scenario, all the countries considered in Scenario 2 are in group A.

Table 5-2 – Pairwise comparisons of countries based on the average (AV) growth rate (Scenario 1), standard deviation (SD) of the growth rate (Scenario 2), AV-SD ratio (Scenario 3) with regard to political instability

Group	S/ No	Country	Average Annual Total Natural Resource Rent-to-Total Tax (NRT) ratio 1980- 2013 (c)	Average Political Stability and Absence of Violence/ Terrorism: Estimate (PSE) 1996-2013 (d)	Average Frequency of government change (FGC) 1980- 2013 (e)	Average Uppsala Internal Conflict Months (ICM) 1980- 2013 (f)	Average GDP growth (AV) 1980- 2013 (g)	Standard deviation of GDP growth (SD) 1980- 2013 (h)	Average GDP growth- to-Standard deviation of GDP growth (AV-SD) ratio 1980- 2013 (i)=(g)/(h)
Scenario 1									
A	19	Niger	0.93	-0.59	0.62	<u>1.12</u>	<u>2.43</u>	5.28	0.46
A	24	South Africa	0.21	-0.14	<u>0.18</u>	3.18	<u>2.44</u>	<u>2.34</u>	<u>1.04</u>
A	28	Tunisia	0.26	-0.02	0.29	<u>0.03</u>	<u>4.18</u>	<u>2.38</u>	<u>1.75</u>
A	17	Morocco	0.10	-0.37	<u>0.26</u>	3.50	<u>4.19</u>	4.42	0.95
A	21	Sao Tome and Principe	0.10	0.42	0.68	nc	<u>4.87</u>	<u>2.96</u>	<u>1.64</u>
A	25	Swaziland	0.28	-0.17	<u>0.38</u>	nc	<u>4.88</u>	4.85	1.01
Scenario 2									
A	12	Lesotho	0.14	0.08	0.29	<u>0.03</u>	<u>3.77</u>	<u>2.31</u>	<u>1.63</u>
A	11	Kenya	0.32	-1.19	<u>0.09</u>	<u>0.03</u>	3.68	<u>2.32</u>	1.59
A	25	Swaziland	0.28	-0.17	<u>0.38</u>	nc	<u>4.88</u>	<u>4.85</u>	<u>1.01</u>
A	15	Mali	0.45	-0.14	0.47	1.41	3.21	<u>4.86</u>	0.66
A	15	Mali	0.45	-0.14	0.47	1.41	3.21	<u>4.86</u>	0.66
A	4	Cabo Verde	0.04	0.88	<u>0.15</u>	nc	<u>7.05</u>	<u>4.87</u>	<u>1.45</u>
Scenario 3									
I: Within-groups									
A	7	Djibouti	0.05	-0.23	<u>0.09</u>	0.91	1.56	<u>3.48</u>	<u>0.45</u>
A	27	Togo	0.65	-0.41	0.38	<u>0.03</u>	<u>2.63</u>	5.83	<u>0.45</u>
B	34	Cameroon	1.21	-0.56	<u>0.24</u>	0.03	2.82	<u>4.86</u>	<u>0.58</u>
B	40	Equatorial Guinea	6.04	-0.01	<u>0.24</u>	nc	<u>16.91</u>	29.14	<u>0.58</u>
B	32	Angola	7.89	-0.96	<u>0.21</u>	7.94	5.75	<u>8.73</u>	<u>0.66</u>
B	36	Chad	3.85	-1.47	0.56	<u>7.88</u>	<u>5.89</u>	8.88	<u>0.66</u>
B	45	Liberia	2.21	-1.36	<u>0.29</u>	<u>1.65</u>	<u>3.31</u>	26.22	<u>0.13</u>
B	37	Congo, Dem. Rep.	9.84	-2.30	0.68	3.03	0.77	<u>5.53</u>	<u>0.14</u>
II: Across-groups									
A	13	Madagascar	0.61	-0.23	0.47	nc	1.74	4.40	<u>0.39</u>
B	42	Gabon	3.95	0.27	<u>0.24</u>	nc	2.17	5.49	<u>0.39</u>
A	17	Morocco	0.10	-0.37	0.26	<u>3.50</u>	4.19	4.42	<u>0.95</u>
B	51	Sudan	1.05	-2.25	<u>0.09</u>	10.82	4.46	4.70	<u>0.95</u>

Sources of raw data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, June). World Development Index; World Bank. (2016, April). World Governance Indicators

Notes: - nc – Non-conflict.

- Lower values of FGC, ICM, and SD, and higher values of AV are underlined. Lower values of PSE are enclosed.

The last scenario has two countries with the same **AV-SD** growth ratio among which, one country has a higher average growth rate and, therefore, inevitably has a higher standard deviation of the growth rate. Because the **AV-SD** ratios are the same for both countries, the pairwise comparisons here are not expected to show a clear relationship between **AV** and **SD** in relation to the level of political stability. For the within-groups (that is, groups A – countries where total tax annually exceeds total

natural resource rents on the average – and B – countries where total natural resource rents annually exceed the total tax on the average) comparisons, three sets of cases with identical **AV-SD** ratios (Djibouti-Togo (Group A), Cameroon-Equatorial Guinea (Group B), and Angola-Chad (Group B)) are compared. In two of the three cases (Djibouti-Togo and Angola-Chad), the countries with the higher average growth rates and, therefore, greater standard deviations in the respective comparisons were more politically unstable. This is, however, reversed with respect to the Cameroon-Equatorial Guinea comparison, where Equatorial Guinea, having an exceptionally high average growth rate, is more politically stable, despite the much higher standard deviation of the growth rate. The country with the lower FGC in all three comparisons here is the more politically stable country.

For the across-groups comparisons in Scenario 3, Gabon (from Group B), which has the higher AV and SD, in the Madagascar-Gabon comparison is more politically stable than Madagascar. Conversely, Morocco (from Group A), which has the lower AD and SD, in the Morocco-Sudan comparison is the more politically stable country.

Overall, given the identical **AV-SD** ratios, the relative influence of the average growth rate and the standard deviation of the growth rate on the level of political stability is not clear for Scenario 3. For the comparisons in Scenario 1 and Scenario 2, however, the size of the standard deviation appears to influence (or be influenced) by the level of political instability the most.

5.4 Empirical analysis

5.4.1 Data

The study includes 52 (out of the 54) countries in Africa for the period 1980 to 2013. Somalia and South Sudan are excluded for reasons of insufficiency of data. Economic and demographic data were sourced from the World Development Indicators of the World Bank.²³ The data on taxes were retrieved from the International Centre for Tax and Development (ICTD) Government Revenue Dataset. Political stability data, namely, Political Stability and Absence of Violence/Terrorism estimate, which runs from 1996 to 2013 but in which the years 1997, 1998 and 2001 are unreported, were sourced from the World Governance Indicators datasets by the World Bank, while the data on conflict were retrieved from the Uppsala Conflict Data Program/ Centre for the Study of Civil Wars, Peace Research Institute Oslo (UCDP/PRIO) Armed Conflict Dataset, Version 4-2015.

The variables, applied variously in the econometric models, are defined as follows. For the set of political or politically determined factors (**P**), we have

²³ There are no cyclically adjusted data in our database. The original data is thus used.

Political stability (PS_{it}) in country i in year t : The level of political stability is expected to have a direct relationship with the level of economic growth, as a politically stable environment would allow for policy consistency as well as a secure economic environment, all of which minimize disruptions to economic/business operations. Political stability may alternatively be measured by the frequency of government change (FGC) and the duration of internal conflict measured in months (ICM).

Total natural resource rent-to-total tax ratio $\left(\frac{TotNatResRent}{TotTax}\right)_{it}$: The total natural resource rent-to-total tax (NRT) ratio indicates the level of dependence of the economy on natural resources. Resource-dependent countries are prone to rent-seeking, which increases the competition for political power by providing an incentive for the opposition (or even rebels) to take over power and, hence, raises the level of political instability. Consequently, an inverse relationship between the total natural resource rent-to-total tax ratio and political stability is expected. Moreover, rent-seeking causes a transfer of skills and resources away from productive economic activities unto the contest for political power, leading to a decline in the level of economic growth. An inverse relationship is, therefore, expected between the total natural resource rent-to-total tax ratio and the level of economic growth. Although the amount of rents received may be outside the control of the government, taxes are politically determined. As a result, the total natural resource rent-to-total tax ratio is a politically determined variable.

Seigniorage $\left(\frac{\pi H}{Y}\right)_{it}$: We expect that there would be an inverse relationship between the level of seigniorage, measured as the product of the rate of inflation and high-powered money, and the level of economic growth.

Fiscal deficit (FD_{it}): Since debt-financed deficits raise the level of interest rates and money-financed deficits are inflationary, it is expected that fiscal deficit would be inversely related to the level of economic growth. It is also expected that fiscal deficit would be inversely related to the level of political stability as higher levels of political instability force governments to increase spending on security and/or patronage even when government revenues are low. Fiscal deficit is measured here as the inverse of General Government Net Lending/Borrowing as a percentage of GDP.

For the set of domestic economic factors (E), we have

Real GDP growth rate (ΔY_{it}) of country i in year t . As mentioned above, a direct relationship is expected to hold between the rate of economic growth and the level of political stability.

Consumption (C_{it}): Higher consumption spending implies an increased demand for goods and services and, therefore, more investment, which is expected to raise the level of economic growth.

Domestic credit to the private sector ($Credit_{it}$): It is included as a proxy for investment, as well as, a proxy for financial development. It is expected that credit to the private sector would raise the level of economic growth. Zouhaier and Karim (2012) used *money and quasi-money* (M2) as proxy for

financial development. However, in the literature, M2 is often used to indicate money supply and has been in used in this paper to form part of the definition of seigniorage.

For the set of demographic factors (D), we have

Secondary school enrolment ($SchEnr_{it}$): School enrolment is taken as an indicator of the level of education, and, therefore, as a quantifier of skill sets available to the economy. A direct relationship between school enrolment and the level of economic growth is, therefore, expected. In addition, school enrolment is expected to have a direct relationship with the level of political stability.

For the set of external factors (Ex), we have

Foreign direct investment (FDI_{it}): The influx of foreign resources into a country provide capital, as well as, technology, which are expected to raise the level of economic growth.

Openness of the economy: Measured as the ratio of merchant trade to GDP, MT_{it} , it is expected that the greater the openness of the economy, the higher the level of economic growth would be. Moreover, it is expected that the more open an economy is to international trade, the greater would be the level of political stability.

5.4.2 Granger Causality Test

As a preliminary, to ascertain causality between the variables, a Granger causality test is conducted for respective pairs of the variables.²⁴ The summary of the results of the Granger causality test is presented in Table 5-3. One of the main variables in this research, Political Stability and Absence of Violence/Terrorism: Estimate (PS), is Granger caused by Foreign direct investment (FDI) when one lag of FDI is included. The Real GDP growth rate (ΔY) is Granger caused by the Frequency of government change (FGC), Total natural resource rent-to-total tax ratio ($\frac{TotNatResRent}{TotTax}$), Merchandise trade (MT), Consumption (C), Foreign direct investment (FDI), and Fiscal deficit (FD). There is two-way causality when two and three lags of C are included and when one, two and three lags of MT and FDI , respectively, are included.

²⁴ Preceding the Granger causality test, the requirement that the series have to be covariance stationary is ascertained through the panel unit root test, the results of which are shown in the Appendices as Appendix 5-A1. For most of the series, the null hypothesis H_0 of non-stationarity can be rejected at the 5% level of significance, both at level and at first difference. However, H_0 is not rejected for Secondary School Enrolment ($SchEnr$) and Domestic Credit to the Private Sector ($Credit$) at level for all of the tests, while it is rejected at first difference, except for the Breitung t-statistic for $SchEnr$. H_0 is not rejected for PS , $\frac{TotNatResRent}{TotTax}$, FD , C , FDI , at level and at first difference for C using Breitung t-statistic.

Table 5-3 – Granger Causality Test Results

	Granger caused by
Political Stability and Absence of Violence/Terrorism: Estimate (PS_{it})	Foreign direct investment (FDI_{it}) ¹
Uppsala Internal Conflict Months (ICM)	Fiscal deficit (FD_{it}) ^{1,2,3} , Real GDP growth rate (ΔY_{it}) ^{1,2} , Consumption (C_{it}) ²
Frequency of government change (FGC)	Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$) ^{1,2} , Fiscal deficit (FD_{it}) ^{1,3} , Uppsala Internal Conflict Months (ICM) ^{2,3}
Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$)	Frequency of government change (FGC) ^{1,2,3} , Seigniorage ($(\frac{\pi H}{Y})_{it}$) ^{1,2,3} , Fiscal deficit (FD_{it}) ¹ , Consumption (C_{it}) ^{1,2,3} , Merchandise trade (MT_{it}) ^{1,2,3} , Domestic credit to the private sector ($Credit_{it}$) ¹ , Foreign direct investment (FDI_{it}) ^{2,3} , Political Stability and Absence of Violence/Terrorism: Estimate (PS_{it}) ³
Seigniorage ($(\frac{\pi H}{Y})_{it}$)	Real GDP growth rate (ΔY_{it}) ^{1,2,3} , Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$) ^{1,2,3} , Fiscal deficit (FD_{it}) ^{1,2,3} , Frequency of government change (FGC) ^{2,3} , Secondary school enrolment ($SchEnr_{it}$) ³ , Merchandise trade (MT_{it}) ³ , Foreign direct investment (FDI_{it}) ³
Fiscal deficit (FD_{it})	Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$) ^{1,2,3} , Seigniorage ($(\frac{\pi H}{Y})_{it}$) ¹ , Consumption (C_{it}) ^{1,2,3} , Domestic credit to the private sector ($Credit_{it}$) ^{1,2} , Foreign direct investment (FDI_{it}) ³
Real GDP growth rate (ΔY_{it})	Frequency of government change (FGC) ^{1,2,3} , Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$) ^{1,2,3} , Merchandise trade (MT_{it}) ^{1,2,3} , Consumption (C_{it}) ^{1,2,3} , Foreign direct investment (FDI_{it}) ^{1,2,3} , Fiscal deficit (FD_{it}) ³
Consumption (C_{it})	Political Stability and Absence of Violence/Terrorism: Estimate (PS_{it}) ¹ , Merchandise trade (MT_{it}) ^{1,2,3} , Secondary school enrolment ($SchEnr_{it}$) ^{1,2} , Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$) ^{1,2,3} , Real GDP growth rate (ΔY_{it}) ^{2,3} , Foreign direct investment (FDI_{it}) ³
Domestic credit to the private sector ($Credit_{it}$)	Political Stability and Absence of Violence/Terrorism: Estimate (PS_{it}) ¹ , Real GDP growth rate (ΔY_{it}) ^{1,2,3} , Secondary school enrolment ($SchEnr_{it}$) ^{1,2,3} , Consumption (C_{it}) ^{1,2} , Fiscal deficit (FD_{it}) ³
Secondary school enrolment ($SchEnr_{it}$)	
Foreign direct investment (FDI_{it})	Real GDP growth rate (ΔY_{it}) ^{1,2,3} , Fiscal deficit (FD_{it}) ^{1,2,3} , Merchandise trade (MT_{it}) ^{1,2,3} , Consumption (C_{it}) ^{2,3} , Political Stability and Absence of Violence/Terrorism: Estimate (PS_{it}) ^{2,3} , Total natural resource rent-to-total tax ratio ($(\frac{TotNatResRent}{TotTax})_{it}$) ^{2,3} , Seigniorage ($(\frac{\pi H}{Y})_{it}$) ³
Merchandise trade (MT_{it})	Political Stability and Absence of Violence/Terrorism: Estimate (PS_{it}) ^{1,2,3} , Real GDP growth rate (ΔY_{it}) ^{1,2,3} , Consumption (C_{it}) ^{1,2,3} , Foreign direct investment (FDI_{it}) ^{1,2,3} , Uppsala Internal Conflict Months (ICM) ² , Secondary school enrolment ($SchEnr_{it}$) ³

¹Significant at the 5% level of significance when **one** lag is included.

²Significant at the 5% level of significance when **two** lags are included.

³Significant at the 5% level of significance when **three** lags are included.

Underlined lags indicate two-way causality at the included lags.

5.4.3 Econometric models

Econometric models are specified for political instability and economic growth. Because of the expected endogeneity in the models, dynamic linear models, in particular, the system generalized method of moments (SGMM), are used.

5.4.3.1 Political instability

The System GMM model for political instability specifies political stability as a function of political stability in the preceding period, the total natural resource rent-to-total tax ratio, fiscal deficit, the growth rate of real GDP, secondary school enrolment, and the indicator for the openness of the economy, which is merchandise trade.

$$PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{TotNatResRent}{TotTax} \right)_{it} + \gamma_3 FD_{it} + \gamma_4 \Delta Y_{it} + \gamma_5 SchEnr_{it} + \gamma_6 MT_{it} + \varepsilon_{it} \quad (1)$$

5.4.3.2 Economic growth

The economic growth System GMM model specifies the economic growth rate as a function of the preceding period's level of economic growth, the level of political stability, fiscal deficit, domestic credit to the private sector, secondary school enrolment, and merchandise trade, which is the indicator for the openness of the economy.

$$\Delta Y_{it} = \alpha_i + \gamma_1 \Delta Y_{it-1} + \gamma_2 PS_{it} + \gamma_3 FD_{it} + \gamma_4 Credit_{it} + \gamma_5 SchEnr_{it} + \gamma_6 MT_{it} + \varepsilon_{it} \quad (2)$$

5.4.4 Empirical results

5.4.4.1 Political instability

The results of the political instability model are presented in the following tables. Table 5-4A shows the results of the analysis using the two-step system generalized method of moments (SGMM). The analysis includes one lag of the dependent variable (political stability) with a maximum lag depth of one. The total natural resource rents-to-total tax ratio, general government net lending/borrowing and the GDP growth rate are taken as endogenous, without lags but a maximum of one lag used as instruments.

The two-step SGMM results show, in accordance with *a priori* expectations, a direct relationship between the GDP growth rate and political stability, implying an inverse relationship

between GDP growth and political instability. Consequently, when growth rates decline, the level of political instability rises.

For the other variables, the total natural resource rents-to-total tax ratio, as expected, has an inverse relationship with political stability. This indicates that the more resource-dependent a country is, the higher the level of political instability, as was previously shown in *Fig. 5-1*. School enrolment, on the other hand, is found to be directly related to the level of political stability. Hence, the more educated a society is, the more politically stable it becomes.

Table 5-4A – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent/total tax (endogenous; lagstruct(0,1)), general government net lending/borrowing (endogenous; lagstruct(0,1)), GDP growth (endogenous; lagstruct(0,1)), secondary school enrolment, and merchandise trade

	(P)	(P,E)	(P,E,D)	(P,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.864***	0.876***	0.781***	0.790***
	(0.035)	(0.044)	(0.054)	(0.051)
TotNatResRent/TotTax	-0.00686*	-0.00871*	-0.0211***	-0.0212***
	(0.003)	(0.004)	(0.005)	(0.005)
General government net lending/borrowing (% of GDP)	0.00120	0.00118	0.00126	0.000707
	(0.002)	(0.002)	(0.002)	(0.002)
GDP growth (annual %)		0.00318	0.00882*	0.00956*
		(0.002)	(0.004)	(0.004)
School enrollment, secondary (% gross)			0.00677***	0.00626***
			(0.002)	(0.001)
Merchandise trade (% of GDP)				0.00116
				(0.001)
Constant	-0.0305	-0.0375	-0.400***	-0.455***
	(0.021)	(0.021)	(0.092)	(0.096)
No. of observations	492	492	311	311
No. of countries	51	51	49	49
No. of instruments	63	84	84	85
Hansen (p-value)	0.8658	0.9982	0.9999	0.9998
AR1 (p-value)	0.0001	0.0001	0.0040	0.0038
AR2 (p-value)	0.9301	0.9239	0.7125	0.7021
AR3 (p-value)	0.9811	0.9508	0.5972	0.5243
Wald chi2	601.98	682.18	457.19	565.70
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5-4B – Fixed Effects (Robust Standard Errors) Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate), total natural resource rent/total tax, general government net lending/borrowing, GDP growth, secondary school enrolment, and merchandise trade

	All countries				Internal conflict (1980-2013)		Average GDP per capita (1980-2013)	
					Yes	Non	Less than \$1,000	Greater than or equal to \$1,000
	(P)	(P,E)	(P,E,D)	(P,E,D,Ext)	(P,E,D,Ext)	(P,E,D,Ext)	(P,E)	(P,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.639***	0.641***	0.546***	0.545***	0.549***	0.358**	0.577***	0.522***
	(0.037)	(0.040)	(0.051)	(0.049)	(0.057)	(0.105)	(0.040)	(0.090)
TotNatResRent/TotTax	-0.00916	-0.0103	-0.0426**	-0.0380*	-0.0362*	0.0716	-0.0445***	0.0233
	(0.008)	(0.010)	(0.015)	(0.014)	(0.014)	(0.194)	(0.011)	(0.023)
General government net lending/borrowing (% of GDP)	0.00250	0.00209	0.00191	0.00210	0.00550	0.00121***	0.00146	0.00270
	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.000)	(0.001)	(0.002)
GDP growth (annual %)		0.00292	0.00929*	0.00971*	0.0105*	0.00814	0.00611*	0.0140*
		(0.002)	(0.004)	(0.004)	(0.005)	(0.006)	(0.003)	(0.006)
School enrollment, secondary (% gross)			-0.00186	-0.00132	0.000937	-0.00730*		-0.00124
			(0.002)	(0.002)	(0.002)	(0.003)		(0.002)
Merchandise trade (% of GDP)				-0.00207	-0.00412	-0.000523		-0.000215
				(0.002)	(0.002)	(0.001)		(0.001)
Constant	-0.138***	-0.149***	-0.0810	0.00983	-0.0852	0.659*	-0.230***	0.0243
	(0.030)	(0.032)	(0.110)	(0.147)	(0.176)	(0.240)	(0.040)	(0.208)
r2	0.449	0.454	0.395	0.400	0.421	0.345	0.443	0.432
No. of observations	492	492	311	311	233	78	325	101
Residual degrees of freedom	50	50	48	48	35	12	33	15
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
No of countries	51	51	49	49	36	13	34	16

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results of the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991) for the respective columns are statistically nonsignificant, thus satisfying the hypothesis that the instruments are valid instruments – that is, the instruments are uncorrelated with the error term – and the excluded instruments are correctly excluded from the estimated equation. As expected, the results of the autoregressive (AR) process are statistically significant for AR(1) and nonsignificant for AR(2) and AR(3). First-order serial correlation is expected since the first lag of the dependent variable, political stability, is used as an explanatory variable in the SGMM regression. On the contrary, there is no second- and third-order autocorrelation. The significant Wald Chi-squared test results indicate that the explanatory variables in the model are statistically significant.

Table 5-4B shows the results for the political instability model using the Fixed-Effects method. The results indicate a statistically significant direct relationship between political stability and the economic growth rate (that is, an inverse relationship between the economic growth rate and political instability) at the 5% level of significance. This is shown to be true for the different classifications of the countries (that is, conflict-affected countries and countries with the average long-term (1980-2013) GDP per capita of less than \$1000, as well as those with average long-term GDP per capita greater than \$1,000). Hence, higher levels of economic growth would have a depressing effect on the level of political instability.

The results, however, unlike the case for the conflict-affected countries, are not statistically significant at the 5% level of significance for the non-conflict-affected countries. This would suggest the importance of conflict, or the absence thereof, in the determination of the relationship between the level of economic growth and political instability.

General government net lending/borrowing is found in to be directly related to the level of political stability in non-conflict affect countries. This indicates that fiscal deficits (that is, a negative fiscal balance) would be associated with higher levels of political instability.

Table 5-5A – Two-Step (Robust Standard Errors) SGMM Regression: GDP growth (lags (1) maxldep (1)), Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (endogenous; lagstruct(0,1)), General government net lending/borrowing (endogenous; lagstruct(0,1)), Domestic credit to private sector, Secondary school enrollment, Merchandise trade

	All countries				Average GDP per capita		Internal conflict
					Greater than or equal to \$300		Yes
	(P)	(P,E)	(P,E,D)	(P,E,D,Ex)	(P,E)	(P,E,D,Ex)	(P,E)
L.GDP growth (annual %)	-0.174 (0.203)	0.104*** (0.020)	0.208*** (0.059)	0.197** (0.062)	0.114*** (0.032)	0.212** (0.067)	0.0959* (0.048)
Political Stability and Absence of Violence/Terrorism: Estimate	-1.454 (2.892)	2.344** (0.822)	1.198 (0.739)	1.196 (0.765)	2.887* (1.174)	2.127* (0.867)	2.020* (0.888)
General government net lending/borrowing (% of GDP)	0.425 (0.304)	0.0956 (0.086)	0.0132 (0.038)	0.0131 (0.039)	0.0819 (0.095)	0.00396 (0.026)	0.168 (0.113)
Domestic credit to private sector (% of GDP)		-0.175** (0.055)	-0.00932 (0.033)	-0.0144 (0.036)	-0.153** (0.058)	-0.0447 (0.046)	-0.0397 (0.061)
School enrollment, secondary (% gross)			-0.0562* (0.025)	-0.0630** (0.024)		-0.0860** (0.033)	
Merchandise trade (% of GDP)				0.00126 (0.024)		-0.0191 (0.027)	
Constant	5.596*** (0.744)	9.161*** (1.213)	7.292*** (1.865)	7.740** (2.544)	8.823*** (1.380)	11.53** (3.728)	6.813*** (1.469)
No. of observations	713	694	431	431	546	332	500
No. of countries	52	52	49	49	41	39	37
No. of instruments	73	74	75	76	74	76	74
Hansen (p-value)	0.9945	0.9744	0.9804	0.9920	0.9985	0.9998	0.9999
AR1 (p-value)	0.1923	0.0018	0.0031	0.0036	0.0023	0.0217	0.0191
AR2 (p-value)	0.8149	0.2884	0.9587	0.9348	0.3287	0.3264	0.3270
AR3 (p-value)	0.6940	0.3833	0.3286	0.3037	0.3160	0.8515	0.6807
Wald chi2	4.10	42.40	28.29	42.76	29.64	31.72	43.96
Chi2 (p-value)	0.2506	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5-5B – Fixed Effects (Robust Standard Errors) Regression: GDP growth, Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate), seigniorage, General government net lending/borrowing, Final consumption expenditure, Domestic credit to private sector, Secondary school enrollment, Foreign direct investment, Merchandise trade

	All countries				Average GDP per capita (1980-13)	
					Less than \$1,000	
					All	Internal conflict
	(P)	(P,E)	(P,E,D)	(P,E,D,Ex)	(P,E)	(P,E)
L.GDP growth (annual %)	-0.0955 (0.179)	0.0926 (0.056)	0.178* (0.081)	0.163* (0.077)	0.0944 (0.057)	0.115 (0.056)
Political Stability and Absence of Violence/Terrorism: Estimate	-0.344 (1.371)	0.659 (0.667)	0.467 (0.768)	0.675 (0.785)	1.514* (0.603)	1.251* (0.584)
Seigniorage ($\pi H/Y$)	-0.00203* (0.001)	-0.00141** (0.000)	-0.000894 (0.001)	-0.00120 (0.001)	-0.00212*** (0.001)	-0.00206** (0.001)
General government net lending/borrowing (% of GDP)	0.141 (0.123)	0.126* (0.059)	0.0177 (0.037)	0.0164 (0.042)	0.0801 (0.044)	0.0817 (0.045)
Final consumption expenditure, etc. (% of GDP)		0.0892 (0.067)	-0.0781** (0.024)	-0.0873** (0.029)	0.00460 (0.013)	0.0121 (0.011)
Domestic credit to private sector (% of GDP)		-0.0875* (0.036)	-0.112** (0.038)	-0.128** (0.044)	-0.0151 (0.055)	-0.0286 (0.062)
School enrollment, secondary (% gross)			0.0406 (0.024)	0.0328 (0.031)		
Foreign direct investment, net inflows (% of GDP)				0.0521 (0.052)		
Merchandise trade (% of GDP)				0.0419* (0.020)		
Constant	6.018*** (1.010)	-0.622 (5.456)	12.31*** (2.125)	11.38*** (2.629)	5.959** (1.771)	5.305** (1.707)
r ²	0.048	0.110	0.119	0.152	0.051	0.050
No. of observations	687	622	379	378	399	337
Residual degrees of freedom	51	48	45	45	31	25
Prob > F	0.0163	0.0000	0.0000	0.0000	0.0005	0.0018
No. of countries	52	49	46	46	32	26

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.4.4.2 Economic growth

The results for the economic growth model are presented in Table 5-5A and Table 5-5B. The two-step SGMM results in Table 5-5A include one lag of the dependent variable (GDP growth) with a maximum lag depth of one. Political stability and general government net lending/borrowing are taken as endogenous, without lags but a maximum of one lag used as instruments. The analysis indicates a direct relationship between the level of political stability and the economic growth rate, as was earlier found for the political instability model. The result remains true for countries whose average GDP per capita is greater than \$300 and for countries which were affected by internal conflict. The results regarding domestic credit to the private sector and school enrolment, however, by respectively having negative values, go against *a priori* expectations.

As was found for the political instability model, the results of the Sargan-Hansen test for overidentifying restrictions (Arellano & Bond, 1991) for the respective columns are statistically nonsignificant. Again, similar to the case of the political instability model, the results of the autoregressive (AR) processes are statistically significant for AR(1), except in the case of column (P) for all countries, while they are nonsignificant for AR(2) and AR(3). First-order serial correlation is expected due to inclusion of the first lag of economic growth in the SGMM regression, while there is no second- and third-order autocorrelation. Except in the case of column (P) for all countries, again, the significant Wald Chi-squared test results indicate that the explanatory variables in the model are statistically significant.

The results in Table 5-5B, analysed using the Fixed-Effects method, include additional variables into the economic growth model. These are seigniorage, final consumption expenditure and foreign direct investments.

$$\begin{aligned} \Delta Y_{it} = & \alpha_i + \gamma_1 \Delta Y_{it-1} + \gamma_2 PS_{it} + \gamma_3 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_4 FDI_{it} + \gamma_5 C_{it} + \gamma_6 Credit_{it} + \gamma_7 SchEnr_{it} \\ & + \gamma_8 FDI_{it} + \gamma_9 MT_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

Seigniorage, as expected is found to have an inverse relationship with the level of economic growth, while merchandise trade (an indicator for the openness of the economy) has a direct relationship with the level of economic growth. Final consumption expenditure, however, against expectation, is found to be inversely related to the level of economic growth. General government net lending/borrowing is found to be directly related to the level of economic growth, implying that greater fiscal deficits would lower the level of economic growth. Regarding the main variable of interest, however, political stability is found to be directly related to the level of economic growth in all countries with average per capita GDP less than \$1,000, and in countries with average GDP per capita less than \$1,000, which were also affected by conflict during the period of the study.

5.4.5 Stability of the economic growth rate

Following the earlier discussion in this paper regarding the relationship between the average (**AV**) growth rate and the standard deviation (**SD**) of the growth rate, the data is re-analysed by taking three-year averages of the data. Since the data runs for 34 years (1980-2013), which would result in 11 three-year averages but with one year left out, the year 1980 is excluded when computing the three-year averages. This leaves us with 11 three-year averages from 1981 to 2013. The average (**AV**) growth rate and the standard deviation (**SD**) of the growth rates, as well as the **AV-SD** ratios for the respective periods 1981-1983, 1984-1986, ..., 2011-2013 are computed. However, since the World Bank World Governance Indicators Political Stability and Absence of Violence/Terrorism estimate (**PSE**) runs only from 1996, this leaves us with six three-year periods in effect, that is, 1996-1998, 1999-2001, 2002-2004, 2005-2007, 2008-2010, and 2011-2013. These are applied to the political instability and economic growth models, respectively, and analysed using the Fixed-Effects method. The political stability model is modified to become:

$$PS_{it} = \alpha_i + \gamma_1 PS_{it-1} + \gamma_2 \left(\frac{TotNatResRent}{TotTax} \right)_{it} + \gamma_3 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_4 FD_{it} + \gamma_5 SD\Delta Y_{it} + \gamma_6 SchEnr_{it} + \gamma_7 MT_{it} + \varepsilon_{it} \quad (4)$$

Only the **SD** is found to have a statistically significant relationship with the level of political stability in the political instability model, the results of which are shown in Table 5-6. The relationship between **SD** and the political stability is an inverse relationship, indicating that wide fluctuations in the growth rate are associated with lower levels of political stability, hence political instability rises with wide fluctuations in the economic growth rate. Furthermore, unlike the non-conflict-affected countries, the fluctuations have a significant influence on political stability in conflict-affected countries.

Table 5-6 – Fixed Effects (Robust Standard Errors) Regression: Three-Year averages of Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate), total natural resource rent/total tax, general government net lending/borrowing, Standard deviation of GDP growth, secondary school enrolment, and merchandise trade; 1981-2013

	All countries				Internal conflict
	(P)	(P,E)	(P,E,D)	(P,E,D,Ext)	Yes (P,E)
TotNatResRent/TotTax	-0.0135 (0.013)	-0.000233 (0.006)	-0.00932 (0.016)	-0.0109 (0.013)	0.00111 (0.018)
General government net lending/borrowing (% of GDP)	0.00847 (0.005)	0.00559 (0.003)	0.00707* (0.004)	0.00776* (0.004)	0.0107 (0.008)
Seigniorage ($\pi H/Y$)	-0.000192*** (0.000)	-0.000196*** (0.000)	-0.000213*** (0.000)	-0.000191*** (0.000)	-0.000192*** (0.000)
STDEV.P Mid-Term GDP growth 1981-2013		-0.0172*** (0.005)	0.00105 (0.010)	0.00193 (0.010)	-0.0209** (0.007)
School enrollment, secondary (% gross)			0.00433 (0.004)	0.00548 (0.004)	
Merchandise trade (% of GDP)				-0.00349 (0.004)	
Constant	-0.413*** (0.035)	-0.397*** (0.015)	-0.610*** (0.168)	-0.448 (0.284)	-0.697*** (0.028)
r ²	0.094	0.149	0.124	0.137	0.184
No. of observations	271	271	203	203	195
Residual degrees of freedom	51	51	48	48	36
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000
No. of countries	52	52	49	49	37

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.4.6 Robustness check

To check the robustness of the results found, the analysis used the frequency of government change in a year (FGC) and the number of internal conflict months in a year (ICM) as indicators of political instability. Since from the Granger causality test results, ICM Granger causes FGC, the model is specified as follows:

$$FGC_{it} = \alpha_i + \gamma_1 FGC_{it-1} + \gamma_2 UppsIntConfM_{it-1} + \gamma_3 \left(\frac{TotNatResRent}{TotTax} \right)_{it} + \gamma_4 \left(\frac{\pi H}{Y} \right)_{it} + \gamma_5 FD_{it} + \gamma_6 \Delta Y_{it} + \gamma_7 SchEnr_{it} + \gamma_8 MT_{it} + \varepsilon_{it} \quad (5)$$

The results presented on Table 5-7 show an inverse relationship between FGC and the GDP growth rate.

Table 5-7 – One-Step (Robust Standard Errors) SGMM Regression: Frequency of government change (lags (1) maxldep (1)), Internal Conflict Months, total natural resource rent/total tax (endogenous; lagstruct(0,2)), seigniorage (endogenous; lagstruct(0,2)), GDP growth (endogenous; lagstruct(0,2)), School enrollment, secondary, and merchandise trade; if internalconflict19802013

	(P)	(P,E)	(P,E,D)	(P,E,D,Ext)
L.Frequency of government change (FGC)	0.0103 (0.061)	0.0259 (0.055)	-0.0150 (0.060)	-0.0182 (0.058)
TotNatResRent/TotTax	0.0475*** (0.011)	0.0492*** (0.013)	0.0389* (0.017)	0.0402* (0.018)
Seigniorage ($\pi H/Y$)	0.0000419 (0.000)	-0.00000795 (0.000)	-0.0000679 (0.000)	-0.0000645 (0.000)
L.Uppsala IntConfMonths	0.00651 (0.013)	0.0102 (0.010)	0.0142 (0.010)	0.0122 (0.011)
General government net lending/borrowing (Percent of GDP)	-0.0206 (0.011)	-0.0140 (0.009)	-0.00512 (0.011)	-0.00504 (0.011)
GDP growth (annual %)		-0.0120*** (0.002)	-0.0220* (0.009)	-0.0215* (0.009)
School enrollment, secondary (% gross)			-0.00264 (0.002)	-0.00227 (0.002)
Merchandise trade (% of GDP)				-0.00162 (0.002)
Constant	0.160* (0.063)	0.223*** (0.065)	0.425*** (0.106)	0.504*** (0.133)
No. of observations	684	684	447	447
No. of countries	37	37	36	36
No. of instruments	244	332	311	312
Hansen (p-value)	0.6642	0.5507	0.2451	0.2518
AR1 (p-value)	0.0000	0.0000	0.0001	0.0001
AR2 (p-value)	0.9344	0.8449	0.2531	0.2912
AR3 (p-value)	0.7212	0.7491	0.5408	0.5324
Wald chi2	88.01	44.13	15.95	22.73
Chi2 (p-value)	0.0000	0.0000	0.0256	0.0037

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.5 Summary and conclusion

The foregoing analysis investigated the relationship between political instability and economic growth in Africa from 1980 to 2013. Through the review of the literature, the analysis found that the relationship between political instability and economic growth flows in either direction; political instability-affecting-economic growth (**PI**→**EG**) and economic growth-affecting-political instability (**EG**→**PI**). The analysis also reviewed the channels through which political instability is related to the level of economic growth. Several channels including the tax system, government spending and fiscal deficit, and inflation, were found in the literature to link political instability and the level of economic growth.

Reviewing the economic and political stability data on Africa, the study found a case where an initial instance of political instability led to a decline in the economic growth rate, which in turn led to further political instability and war. Further review of the data showed a pattern of relationship between the level of political instability and the average (**AV**) long-term economic growth rate, the standard deviation (**SD**) of the growth rate, as well as the interaction between the **AV** and the **SD**. Some scenarios were considered using pairwise comparisons of countries to determine how the **AV** and the **SD** relate to the level of political instability. The scenarios suggested that a relatively higher **AV** or a relatively smaller **SD** coincided with lower levels of political instability. Thus, higher and relatively more stable economic growth rates are indicated to coincide with higher levels of political stability (or lower levels of political instability) in especially countries that are less dependent on natural resources in relation to total tax collection.

Through econometric analysis of the data, the analysis found there to be a statistically significant direct relationship between political stability and the level of economic growth. This is true for both the political instability model and the economic growth model. Political instability lowers the level of economic growth, on the one hand, while lower levels of economic growth worsened the level of political instability, on the other hand. The relationships were found to be especially true for conflict-affected countries.

Further analysis using three-year averages of the data from 1981 to 2013 found that greater fluctuations in the economic growth rate negatively affected the level of political stability. This indicates a connection between economic instability and political instability; economic instability leading to political instability. This relationship is found to be especially true for conflict-affected states.

The analysis, therefore, concludes that there is a strong bi-directional direct relationship between political stability and the level of economic growth. Additionally, the analysis also concludes that economic instability is correlated with political instability.

CHAPTER SIX

CONCLUSION AND IMPLICATIONS FOR POLICY AND/OR FURTHER RESEARCH

6.1 Summary and conclusion

The economic analysis of political instability in Africa evaluates data from up to 52 countries in Africa for various periods between 1980 and 2013 to ascertain the relationship between economic conditions and political instability. The study aims to determine how economic variables impact upon and/or are impacted upon by the level of political instability.

The study on resource rents, taxation, and political instability in Africa, sought to determine if the interaction between natural resource rents and taxation had an influence on the level of political instability. Considered separately, the study finds a significant inverse relationship between total natural resource rents and political instability, while there is no significant relationship between total tax and political instability. Through the review of literature, the study determined how natural resource rents reduce tax collection, and how this interaction influences the level of political instability. Quantitative analyses show that the ratio of natural resource rent-to-total tax (**NRT**) has a significant inverse relationship with the level of political stability. Additionally, the ratios of the individual components of the natural resource rent-to-total tax, except for forest rents, also have significant negative influences on political stability.

The tax structure, through the use of conditional correlations, has been found to influence the level of political instability. The study on the tax structure and political instability in Africa proposes that the relative simplicity of direct taxes and their larger per transaction payments, when compared to indirect taxes, increases their potential for generating disaffection in the taxpayer and thus creates conditions for political instability. The study finds that in countries with higher long-term average ratios of direct tax-to-indirect tax (**DITR**), higher **DITR** are related to higher levels of political instability. The same is found to be true when there are wide fluctuations in the direct tax.

The study on the determinants of fiscal deficit in conflict-affected states in Africa demonstrates a pattern of relationship between fiscal deficit and political instability; when government changes occur during periods of conflict, there are sharp increases in the fiscal deficit. Quantitative analyses show this to be especially true with regard to the duration of conflict. The decline in economic productivity, occasioned by the conflict situation, and the consequent decline in the tax potential of the economy, at a time when military and relief spending has increased and expenditures on economic and social services need to be maintained, results in a decline of the fiscal balance. Additionally, pre-existing economic conditions are also found to affect the level of fiscal deficit.

Political instability has also been found to be indirectly related to the rate of economic growth. This relationship is bi-directional; political instability influences the rate of economic growth, on the one hand, while the rate of economic growth influences the level of political instability, on the other hand. Additionally, the study on political instability and economic growth in Africa demonstrates a number of scenarios where higher and relatively more stable growth rates, on the average, coincide with lower levels of political instability. The study goes further to find a significant direct relationship between wide fluctuations in the growth rate and the level of political instability. Thus, economic instability is correlated with political instability.

The foregoing analysis concludes that there is a significant relationship between economic conditions, particularly, those covered in this analysis, and political instability. Thus, changes in these economic conditions influence the level of political instability, and are, in some cases, the result of political instability.

6.2 Implications for policy and/or further research

Economic policy analysis oftentimes is concerned with achieving and improving on certain optimality conditions that are necessary to maintain an optimally functioning economic system that in turn maximizes the total welfare of the society. While this is necessary to maintain the full functioning of individuals and systems in the economy, the maintenance of a stable socio-political environment is also important in the achievement and maintenance of the optimal economic state. The findings of this study demonstrate a clear connection between the economic variables studied and the level of political instability. The design of policy must, therefore, take into careful consideration how these variables could affect the level of political stability if a considerably stable economic environment must be maintained.

While some of the variables studied could very well fall under the control of the policymaker, others may not be so easily controlled. Hence, while taxation, for example, may, to a greater extent, be subject to policy, resource rents, given their nature of being determined by conditions that are external to the domestic economy, may not be easily subjected to policy, save for policies that target certain upper limits of rents and channels these into some investment portfolios. The policymaker would thus find it expedient to maintain an appreciable level of taxation, in this case, in order to maintain a significant level of popular participation in governance and thereby ensure that citizen-government channels of communication are maintained, and thus reduce the risks of socio-political unrest, while being conscious of the risk of a tax revolt that certain types of taxes present.

Since this study relied on the tax collection rather than tax rates, due to the insufficiency of long-term data on tax rates, further analysis would be required to determine how changes in the tax rate, which is under the control of the policymaker, rather than the tax collections, affect the level of political stability. It would then become clearer if fluctuations in tax are the result of policy inconsistency or are the result of tax evasion or avoidance, which in turn may make clearer the political behaviour of tax evaders, for example.

Additionally, while the study on fiscal deficit dwelt on the factors that determined it, further research on the effects of fiscal deficit on other economic variables, as well as, its potential to determine the level of political stability through debt accumulation and the consequent need to amortize the debt when due, which may affect the provision of essential public services with potentially severe socio-political consequences, is necessary. Such and other related analyses would be an interesting endeavour.

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APPENDICES

Appendix 2-A1 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total tax/total natural resource rent (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.842***	0.816***	0.827***	0.830***
	(0.042)	(0.036)	(0.044)	(0.041)
TotTax/TotNatResRent	0.0000723***	0.0000629***	0.0000556*	0.0000603***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita (constant 2005		0.0000198***	0.0000219**	0.0000172**
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			-0.00219	0.00134
			(0.004)	(0.002)
Current account balance (% of GDP)				-0.00256
				(0.002)
Constant	-0.0670**	-0.117***	-0.0253	-0.178
	(0.024)	(0.031)	(0.182)	(0.094)
No. of observations	499	499	499	460
No. of countries	51	51	51	51
No. of instruments	42	63	64	85
Hansen (p-value)	0.2947	0.8941	0.8870	0.9995
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.8965	0.8862	0.8823	0.9914
AR3 (p-value)	0.8447	0.8228	0.8206	0.9417
Wald chi2	1956.52	1714.94	3802.82	2996.78
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-A2 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent(endogenous; lagstruct(0,1)), total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.827*** (0.047)	0.794*** (0.057)	0.793*** (0.056)	0.794*** (0.032)
Total natural resources rents (% of GDP)	-0.000585 (0.002)	-0.00284 (0.002)	-0.00311** (0.001)	-0.00328** (0.001)
TotTax	0.00449 (0.003)	0.00376 (0.003)	0.00329 (0.003)	0.00351 (0.003)
GDP per capita (constant 2005 US\$)		0.0000252*** (0.000)	0.0000248*** (0.000)	0.0000230*** (0.000)
Urban population (% of total)			0.000693 (0.002)	0.00198 (0.001)
Current account balance (% of GDP)				-0.000807 (0.001)
Constant	-0.128 (0.074)	-0.133 (0.074)	-0.153 (0.141)	-0.200* (0.083)
No. of observations	499	499	499	460
No. of countries	51	51	51	51
No. of instruments	63	84	85	106
Hansen (p-value)	0.7975	0.9998	0.9998	1.0000
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.8581	0.8199	0.8193	0.9276
AR3 (p-value)	0.8362	0.8268	0.8279	0.9760
Wald chi2	337.35	481.92	609.01	1493.17
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-B – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	Average total natural resource rents-to-total tax ratio					
	Less than			Greater than or equal to		
	1:2	1:1	2:1	1:2	1:1	2:1
	(R,E,D)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R,E,D)	(R,E,D)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.795***	0.736***	0.834***	0.807***	0.837***	0.873***
	(0.038)	(0.057)	(0.099)	(0.029)	(0.036)	(0.063)
TotNatResRent/TotTax	-0.212**	-0.0621*	-0.0851*	-0.00705*	-0.00520*	-0.00550***
	(0.079)	(0.025)	(0.041)	(0.003)	(0.002)	(0.002)
GDP per capita (constant 2005 US\$)	0.0000160	0.0000301*	0.00000553	0.0000255	0.0000289	0.0000183
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban population (% of total)	0.000240		0.00559	-0.00395	-0.00319	-0.00406***
	(0.004)		(0.004)	(0.003)	(0.002)	(0.001)
Current account balance (% of GDP)				0.00155		
				(0.002)		
Constant	0.00343	-0.0350	-0.202	0.0214	-0.0464	0.112
	(0.206)	(0.042)	(0.166)	(0.097)	(0.052)	(0.135)
No. of observations	171	279	340	295	220	159
No. of countries	18	29	35	33	22	16
No. of instruments	64	63	64	85	64	64
Hansen (p-value)	1.0000	1.0000	0.9981	1.0000	1.0000	1.0000
AR1 (p-value)	0.0224	0.0075	0.0029	0.0011	0.0006	0.0010
AR2 (p-value)	0.5772	0.8746	0.9324	0.4260	0.7115	0.3978
AR3 (p-value)	0.6189	0.8163	0.6094	0.5923	0.7104	0.2052
Wald chi2	592.73	283.90	1465.62	2178.37	4666.45	937.39
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-C1 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), coal rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.869***	0.874***	0.881***	0.891***
	(0.047)	(0.043)	(0.053)	(0.032)
CoalRent/TotTax	-0.317***	-0.319***	-0.327***	-0.575
	(0.045)	(0.036)	(0.048)	(0.347)
GDP per capita (constant 2005 US\$)		0.0000146	0.0000187	0.00000847
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			-0.00195	0.00105
			(0.005)	(0.002)
Current account balance (% of GDP)				-0.00253
				(0.001)
Constant	-0.0491	-0.0707	0.00362	-0.108
	(0.026)	(0.040)	(0.210)	(0.070)
No. of observations	494	494	494	455
No. of countries	51	51	51	51
No. of instruments	39	60	61	82
Hansen (p-value)	0.1734	0.7473	0.6952	0.9985
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.9037	0.8876	0.8842	0.8028
AR3 (p-value)	0.8931	0.8864	0.8807	0.7392
Wald chi2	551.43	2720.55	1895.23	1345.51
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-C2 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), forest rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.868***	0.818***	0.819***	0.832***
	(0.063)	(0.043)	(0.060)	(0.036)
ForestRent/TotTax	-0.00352	-0.00542	-0.00549	0.0119
	(0.032)	(0.027)	(0.025)	(0.027)
GDP per capita (constant 2005 US\$)		0.0000193**	0.0000197**	0.0000163**
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			-0.000129	0.00156
			(0.005)	(0.002)
Current account balance (% of GDP)				-0.00230
				(0.002)
Constant	-0.0419	-0.0952*	-0.0926	-0.172*
	(0.028)	(0.037)	(0.220)	(0.082)
No. of observations	491	491	491	452
No. of countries	51	51	51	51
No. of instruments	42	63	64	85
Hansen (p-value)	0.3520	0.8327	0.8047	0.9989
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.8094	0.8003	0.8002	0.9026
AR3 (p-value)	0.7752	0.7589	0.7587	0.8668
Wald chi2	338.25	776.86	723.31	1399.19
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-C3 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), mineral rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.816***	0.815***	0.821***	0.828***
	(0.049)	(0.037)	(0.055)	(0.046)
MineralRent/TotTax	-0.0690*	-0.0602**	-0.0617**	-0.0677*
	(0.032)	(0.020)	(0.020)	(0.030)
GDP per capita (constant 2005 US\$)		0.0000180**	0.0000187**	0.0000133*
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			-0.000725	0.00287
			(0.005)	(0.003)
Current account balance (% of GDP)				-0.00248
				(0.002)
Constant	-0.0629*	-0.0980**	-0.0701	-0.213
	(0.030)	(0.035)	(0.210)	(0.110)
No. of observations	499	499	499	460
No. of countries	51	51	51	51
No. of instruments	42	63	64	85
Hansen (p-value)	0.2837	0.7926	0.8202	0.9986
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.8644	0.8608	0.8607	0.9632
AR3 (p-value)	0.9306	0.8982	0.8993	0.9576
Wald chi2	277.31	745.69	667.21	1842.80
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-C4 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), natural gas rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.853***	0.879***	0.882***	0.872***
	(0.041)	(0.043)	(0.086)	(0.106)
NatGasRent/TotTax	-0.0142	-0.0516*	-0.0387	-0.0399
	(0.025)	(0.023)	(0.034)	(0.060)
GDP per capita (constant 2005 US\$)		0.0000170	0.0000252	0.0000174
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			-0.00320	-0.000657
			(0.004)	(0.004)
Current account balance (% of GDP)				-0.000717
				(0.003)
Constant	-0.0580*	-0.0694	0.0427	-0.0486
	(0.027)	(0.041)	(0.150)	(0.189)
No. of observations	486	486	486	452
No. of countries	51	51	51	51
No. of instruments	42	63	64	83
Hansen (p-value)	0.4020	0.8285	0.8859	0.9971
AR1 (p-value)	0.0001	0.0001	0.0002	0.0003
AR2 (p-value)	0.8571	0.8320	0.8281	0.7545
AR3 (p-value)	0.9848	0.9944	0.9983	0.7884
Wald chi2	462.31	2024.03	326.30	381.20
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-C5 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), oil rent/total tax (endogenous; lagstruct(0,1)), seigniorage (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.849*** (0.030)	0.821*** (0.035)	0.825*** (0.050)	0.830*** (0.151)
OilRent/TotTax	-0.00713*** (0.001)	-0.0123*** (0.003)	-0.0117** (0.004)	-0.0134 (0.008)
GDP per capita (constant 2005 US\$)		0.0000316*** (0.000)	0.0000327*** (0.000)	0.0000283 (0.000)
Urban population (% of total)			-0.00101 (0.003)	0.00109 (0.002)
Current account balance (% of GDP)				0.00100 (0.002)
Constant	-0.0507* (0.023)	-0.113** (0.037)	-0.0726 (0.143)	-0.140 (0.157)
No. of observations	485	485	485	453
No. of countries	51	51	51	51
No. of instruments	42	63	64	85
Hansen (p-value)	0.2894	0.8215	0.8602	0.9992
AR1 (p-value)	0.0001	0.0001	0.0001	0.0010
AR2 (p-value)	0.8719	0.8644	0.8617	0.8096
AR3 (p-value)	0.9664	0.9504	0.9495	0.7350
Wald chi2	870.54	1440.71	1323.18	952.13
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-C6 – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.841*** (0.042)	0.804*** (0.035)	0.828*** (0.043)	0.824*** (0.033)
CoalRent/TotTax	-0.0580 (0.114)	-0.0470 (0.331)	-0.753 (0.535)	-0.748 (0.470)
ForestRent/TotTax	-0.0288 (0.022)	-0.0199 (0.022)	0.00507 (0.030)	0.0122 (0.033)
MineralRent/TotTax	-0.0592*** (0.015)	-0.0966* (0.047)	-0.0765 (0.055)	-0.0184 (0.038)
NatGasRent/TotTax	-0.0112 (0.059)	-0.00115 (0.039)	-0.00964 (0.047)	-0.0150 (0.037)
OilRent/TotTax	-0.00630 (0.004)	-0.0124*** (0.003)	-0.0113*** (0.003)	-0.0112*** (0.002)
GDP per capita (constant 2005 US\$)		0.0000308*** (0.000)	0.0000306** (0.000)	0.0000288*** (0.000)
Urban population (% of total)			-0.0000211 (0.001)	0.000438 (0.002)
Current account balance (% of GDP)				0.000277 (0.002)
Constant	-0.0138 (0.025)	-0.0810* (0.033)	-0.0838 (0.052)	-0.112 (0.084)
No. of observations	476	476	476	444
No. of countries	51	51	51	51
No. of instruments	121	140	141	156
Hansen (p-value)	1.0000	1.0000	1.0000	1.0000
AR1 (p-value)	0.0001	0.0001	0.0001	0.0001
AR2 (p-value)	0.9475	0.9604	0.9930	0.8915
AR3 (p-value)	0.9077	0.8406	0.7342	0.6385
Wald chi2	926.85	4027.68	3620.43	2291.45
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-D – Two-Step (Robust Standard Errors) SGMM Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1) maxldep (1)), total natural resource rent/total tax (endogenous; lagstruct(0,1)), GDP per capita (endogenous; lagstruct(0,1)), urbanization, and current account balance (endogenous; lagstruct(0,1))

	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.869***	0.842**	0.839*	0.815
	(0.045)	(0.307)	(0.401)	(0.444)
TotNatResRent/TotTax	-0.00603*	-0.00987	-0.0101	-0.00907
	(0.003)	(0.013)	(0.016)	(0.015)
yr2003	0.0769	0.0851	0.0993	0.114
	(0.062)	(0.469)	(0.440)	(0.812)
yr2004	0.0656	0.0362	0.0355	0.0592
	(0.065)	(0.437)	(0.422)	(0.751)
yr2005	-0.0189	-0.0615	-0.0439	-0.0388
	(0.051)	(0.376)	(0.313)	(0.725)
yr2006	0.0672	0.0767	0.0797	0.100
	(0.072)	(0.293)	(0.291)	(0.763)
yr2007	0.0284	0.00543	0.00742	0.0293
	(0.063)	(0.214)	(0.195)	(0.587)
yr2008	-0.00291	-0.0170	-0.00515	-0.00742
	(0.055)	(0.199)	(0.170)	(0.603)
yr2009	0.0364	0.0152	0.0254	0.0144
	(0.049)	(0.164)	(0.146)	(0.586)
yr2010	-0.0379	-0.0580	-0.0542	-0.0739
	(0.049)	(0.128)	(0.122)	(0.439)
yr2011	-0.0459	-0.0457	-0.0387	-0.0793
	(0.058)	(0.110)	(0.116)	(0.404)
yr2012	-0.00289	0.00246	0.00658	-0.00467
	(0.043)	(0.076)	(0.089)	(0.419)
GDP per capita (constant 2005 US\$)		0.0000228	0.0000234	0.0000218
		(0.000)	(0.000)	(0.000)
Urban population (% of total)			0.000112	0.00310
			(0.002)	(0.006)
Current account balance (% of GDP)				-0.00222
				(0.004)
Constant	-0.0492	-0.0710	-0.0836	-0.235
	(0.049)	(0.108)	(0.187)	(0.323)
No. of observations	499	499	499	460
No. of countries	51	51	51	51
No. of instruments	52	73	74	95
Hansen (p-value)	0.5164	0.9958	0.9984	1.0000
AR1 (p-value)	0.0000	0.0195	0.0569	0.0740
AR2 (p-value)	0.8432	0.7817	0.7786	0.8499
AR3 (p-value)	0.8928	0.8615	0.8690	0.7297
Wald chi2	983.57	1664.35	1588.96	701.94
Chi2 (p-value)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-E – Two-Way (Robust Standard Errors) Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate), total natural resource rent/total tax, GDP per capita, urbanization, and current account balance

	Pooled OLS				Fixed Effects				Random Effects			
	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)	(R)	(R,E)	(R,E,D)	(R,E,D,Ext)
TotNatResRent/TotTax	-0.0372*** (0.011)	-0.0625*** (0.007)	-0.0637*** (0.008)	-0.0602*** (0.008)	-0.0120 (0.008)	-0.0186 (0.010)	-0.0176 (0.010)	-0.0166 (0.010)	-0.0130 (0.009)	-0.0212* (0.010)	-0.0208* (0.010)	-0.0198 (0.011)
yr1996	0.229 (0.227)	0.210 (0.209)	0.260 (0.208)	0.650* (0.313)	-0.154 (0.143)	-0.0942 (0.147)	0.105 (0.221)	0.367 (0.255)	-0.148 (0.143)	-0.0724 (0.144)	0.0148 (0.145)	0.297 (0.220)
yr1998	0.184 (0.230)	0.147 (0.212)	0.189 (0.213)	0.583 (0.315)	-0.203 (0.159)	-0.159 (0.163)	0.0164 (0.219)	0.290 (0.251)	-0.197 (0.158)	-0.140 (0.160)	-0.0627 (0.162)	0.231 (0.228)
yr2000	0.159 (0.228)	0.102 (0.207)	0.131 (0.206)	0.530 (0.311)	-0.193 (0.154)	-0.168 (0.155)	-0.0138 (0.204)	0.256 (0.240)	-0.188 (0.153)	-0.152 (0.153)	-0.0853 (0.156)	0.207 (0.224)
yr2002	0.126 (0.226)	0.0502 (0.208)	0.0744 (0.207)	0.469 (0.312)	-0.223 (0.150)	-0.205 (0.152)	-0.0745 (0.188)	0.195 (0.225)	-0.218 (0.149)	-0.191 (0.150)	-0.135 (0.151)	0.156 (0.214)
yr2003	0.237 (0.225)	0.165 (0.206)	0.185 (0.205)	0.577 (0.310)	-0.135 (0.141)	-0.116 (0.142)	0.000742 (0.180)	0.272 (0.228)	-0.129 (0.140)	-0.102 (0.140)	-0.0514 (0.143)	0.241 (0.217)
yr2004	0.297 (0.222)	0.207 (0.204)	0.226 (0.202)	0.619* (0.308)	-0.0723 (0.130)	-0.0616 (0.132)	0.0432 (0.163)	0.315 (0.212)	-0.0661 (0.129)	-0.0500 (0.131)	-0.00368 (0.131)	0.288 (0.204)
yr2005	0.258 (0.223)	0.160 (0.205)	0.178 (0.203)	0.574 (0.309)	-0.110 (0.130)	-0.104 (0.132)	-0.0113 (0.159)	0.260 (0.218)	-0.104 (0.129)	-0.0941 (0.131)	-0.0523 (0.132)	0.240 (0.211)
yr2006	0.344 (0.225)	0.233 (0.205)	0.250 (0.203)	0.656* (0.309)	-0.0407 (0.126)	-0.0376 (0.126)	0.0425 (0.146)	0.313 (0.213)	-0.0342 (0.125)	-0.0286 (0.125)	0.00802 (0.126)	0.300 (0.208)
yr2007	0.352 (0.232)	0.248 (0.207)	0.266 (0.206)	0.695* (0.311)	-0.0431 (0.130)	-0.0429 (0.130)	0.0237 (0.143)	0.296 (0.219)	-0.0360 (0.129)	-0.0345 (0.129)	-0.00255 (0.130)	0.292 (0.216)
yr2008	0.294 (0.229)	0.153 (0.207)	0.167 (0.204)	0.572 (0.311)	-0.0722 (0.127)	-0.0832 (0.127)	-0.0277 (0.139)	0.227 (0.216)	-0.0662 (0.126)	-0.0788 (0.126)	-0.0517 (0.126)	0.224 (0.213)
yr2009	0.304 (0.227)	0.163 (0.204)	0.170 (0.203)	0.569 (0.310)	-0.0491 (0.118)	-0.0588 (0.117)	-0.0150 (0.125)	0.236 (0.211)	-0.0435 (0.117)	-0.0544 (0.116)	-0.0336 (0.116)	0.238 (0.208)
yr2010	0.279 (0.225)	0.171 (0.203)	0.173 (0.202)	0.591 (0.309)	-0.0738 (0.108)	-0.0836 (0.109)	-0.0515 (0.115)	0.198 (0.203)	-0.0681 (0.107)	-0.0787 (0.108)	-0.0630 (0.109)	0.207 (0.201)
yr2011	0.258 (0.224)	0.170 (0.202)	0.165 (0.201)	0.547 (0.309)	-0.118 (0.099)	-0.118 (0.097)	-0.0958 (0.100)	0.145 (0.194)	-0.111 (0.097)	-0.110 (0.096)	-0.100 (0.096)	0.161 (0.189)
yr2012	0.282 (0.227)	0.189 (0.204)	0.182 (0.203)	0.530 (0.317)	-0.0839 (0.093)	-0.0922 (0.092)	-0.0814 (0.093)	0.107 (0.187)	-0.0774 (0.092)	-0.0858 (0.090)	-0.0800 (0.091)	0.128 (0.180)
GDP per capita (constant 2005 US\$)		0.000177*** (0.000)	0.000152*** (0.000)	0.000151*** (0.000)		0.0000784 (0.000)	0.0000867* (0.000)	0.0000926* (0.000)		0.000102* (0.000)	0.0000920* (0.000)	0.0000983** (0.000)
Urban population (% of total)			0.00864*** (0.002)	0.00933*** (0.002)			0.0296 (0.028)	0.0285 (0.029)			0.0140* (0.006)	0.0134* (0.007)
Current account balance (% of GDP)				-0.00451* (0.002)				-0.000601 (0.002)				-0.000939 (0.002)
Constant	-0.665*** (0.189)	-0.833*** (0.176)	-1.147*** (0.187)	-1.592*** (0.298)	-0.363** (0.119)	-0.498*** (0.139)	-1.785 (1.229)	-1.996 (1.226)	-0.357* (0.146)	-0.532*** (0.156)	-1.113*** (0.306)	-1.394*** (0.337)
r2	0.049	0.291	0.313	0.316	0.036	0.066	0.078	0.077				
No. of observations	703	699	699	657	703	699	699	657	703	699	699	657
Residual degrees of freedom	687	682	681	638	51	51	51	51				
No. of countries	51	51	51	51	52	52	52	52	52	52	52	52

Standard errors in parentheses

Sources: World Bank. (2015, June). World Development Indicators; World Bank. (2016, April). World Governance Indicators; Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 2-F – Panel Unit Root Test Results

Panel unit root test: Summary

Series: POLITICAL_STABILITY_AND_

Date: 12/08/17 Time: 02:37

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.1027	0.0000	53	570
Breitung t-stat	-0.13213	0.4474	53	517
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.79810	0.0001	53	570
ADF - Fisher Chi-square	170.276	0.0001	53	570
PP - Fisher Chi-square	200.452	0.0000	53	583

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(POLITICAL_STABILITY_AND_)

Date: 12/08/17 Time: 02:37

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-28.3374	0.0000	53	507
Breitung t-stat	-8.95176	0.0000	53	454
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-10.8386	0.0000	53	507
ADF - Fisher Chi-square	352.014	0.0000	53	507
PP - Fisher Chi-square	518.798	0.0000	53	530

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TOTNATRESRENT_TOTTAX

Date: 12/08/17 Time: 02:42

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-35.8563	0.0000	53	1456
Breitung t-stat	-6.2E-11	0.5000	53	1403
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.8921	0.0000	52	1454
ADF - Fisher Chi-square	582.842	0.0000	52	1454
PP - Fisher Chi-square	894.210	0.0000	52	1482

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(TOTNATRESRENT_TOTTAX)

Date: 12/08/17 Time: 02:42

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-57.1006	0.0000	52	1394
Breitung t-stat	-10.2435	0.0000	52	1342
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-41.5836	0.0000	52	1394
ADF - Fisher Chi-square	1391.71	0.0000	52	1394
PP - Fisher Chi-square	3377.63	0.0000	52	1419

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDP_PER_CAPITA__CONSTANT

Date: 02/21/18 Time: 11:52

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.66609	0.0038	52	1660
Breitung t-stat	10.6922	1.0000	52	1608
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.52381	0.9362	52	1660
ADF - Fisher Chi-square	113.967	0.2370	52	1660
PP - Fisher Chi-square	82.9461	0.9363	52	1671

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(GDP_PER_CAPITA__CONSTANT)

Date: 02/21/18 Time: 11:56

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.1048	0.0000	52	1655
Breitung t-stat	-14.8388	0.0000	52	1603
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-26.6954	0.0000	52	1655
ADF - Fisher Chi-square	855.020	0.0000	52	1655
PP - Fisher Chi-square	970.874	0.0000	52	1657

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: URBAN_POPULATION____OF_T

Date: 02/21/18 Time: 11:58

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 1 to 5

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.01899	0.0013	54	1836
Breitung t-stat	14.9695	1.0000	54	1782
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.23822	0.0126	54	1836
ADF - Fisher Chi-square	194.307	0.0000	54	1836
PP - Fisher Chi-square	469.410	0.0000	54	1836

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(URBAN_POPULATION____OF_T)

Date: 02/21/18 Time: 11:59

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.95709	0.0252	54	1836
Breitung t-stat	0.01486	0.5059	54	1782
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.38564	0.3499	54	1836
ADF - Fisher Chi-square	188.225	0.0000	54	1836
PP - Fisher Chi-square	144.964	0.0102	54	1836

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: CURRENT_ACCOUNT_BALANCE_

Date: 02/21/18 Time: 12:22

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.75813	0.0000	52	1521
Breitung t-stat	-5.97927	0.0000	52	1469
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.57907	0.0000	52	1521
ADF - Fisher Chi-square	287.062	0.0000	52	1521
PP - Fisher Chi-square	535.913	0.0000	52	1551

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(CURRENT_ACCOUNT_BALANCE_)

Date: 02/21/18 Time: 12:23

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 6

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.6925	0.0000	52	1457
Breitung t-stat	-10.4699	0.0000	52	1405
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-28.2008	0.0000	52	1457
ADF - Fisher Chi-square	886.144	0.0000	52	1457
PP - Fisher Chi-square	3667.35	0.0000	52	1499

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Appendix 3-A1 – Fixed-Effects (Robust Standard Errors) Regression: Political instability (frequency of government change and conflict months) (lags (1)), direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance

All countries		Average Direct-to-Indirect Tax Ratio (1980-2013)										
		Less than							Greater than or equal to			
		3:10	5:10	6:10	7:10	8:10	9:10	1:1	3:10	4:10	9:10	1:1
(R,E,D,Ext)		(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R)	(R,E,D,Ext)	(R)	(R,E,D,Ext)	(R,E,D,Ext)
L.Equal weight	0.658***	0.246	0.692***	0.644***	0.644***	0.650***	0.649***	0.642***	0.664***	0.693***	0.473	0.973
FGC*UppsalaIntConfMonths	(0.058)	(0.117)	(0.070)	(0.070)	(0.070)	(0.064)	(0.061)	(0.061)	(0.059)	(0.064)	(0.364)	(0.238)
Direct tax	-0.0577* (0.029)	-0.0628** (0.013)	-0.0724* (0.035)	-0.0930* (0.040)	-0.0904* (0.039)	-0.0747* (0.035)	-0.0667* (0.032)	-0.0561* (0.025)	-0.0704* (0.034)	-0.0558* (0.026)	0.225** (0.010)	0.540* (0.025)
Indirect tax	-0.00610 (0.013)	-0.00612 (0.013)	0.0000491 (0.011)	0.000812 (0.012)	0.000183 (0.012)	0.00288 (0.011)	0.000766 (0.011)	-0.00121 (0.010)	-0.00939 (0.019)	-0.00169 (0.012)	-0.267* (0.044)	-0.595 (0.093)
Seigniorage (πH/Y)	-0.000000168 (0.000)	-0.0000259 (0.000)	-0.00000185 (0.000)	-0.00000139 (0.000)	-0.00000117 (0.000)	-0.00000185 (0.000)	-0.00000152 (0.000)	-0.00000260 (0.000)	-0.00000146 (0.000)	-0.00000376* (0.000)	0.000378 (0.000)	-0.00109 (0.001)
GDP per capita (constant 2005 US\$)	-0.0000139 (0.000)	-0.0000621 (0.000)	0.00000166 (0.000)	0.0000207 (0.000)	0.0000200 (0.000)	0.0000193 (0.000)	0.0000174 (0.000)		-0.00000344 (0.000)		-0.000508 (0.001)	0.000203 (0.001)
Urban population (% of total)	-0.00155 (0.009)	0.0438* (0.015)	0.00201 (0.008)	0.00473 (0.009)	0.00488 (0.009)	0.00283 (0.009)	0.00208 (0.008)		-0.00426 (0.010)		-0.224 (0.166)	-0.0460 (0.150)
Current account balance (% of GDP)	-0.00447 (0.003)	-0.00402 (0.003)	-0.00196 (0.004)	-0.00437 (0.003)	-0.00445 (0.003)	-0.00449 (0.003)	-0.00458 (0.003)		-0.00683 (0.004)		-0.0156 (0.044)	-0.0165 (0.159)
Constant	0.753* (0.302)	-0.152 (0.400)	0.532* (0.220)	0.506 (0.253)	0.487 (0.243)	0.485* (0.237)	0.538* (0.237)	0.645** (0.186)	0.919* (0.365)	0.671** (0.214)	15.99 (13.139)	-0.0445 (3.260)
r2	0.451	0.120	0.502	0.437	0.436	0.439	0.435	0.422	0.463	0.507	0.762	0.909
No. of observations	1101	173	771	908	955	1021	1055	1102	928	586	46	33
Residual degrees of freedom	51	7	33	40	42	46	48	49	43	27	2	1
Prob > F	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-
No of countries	52 ^a	8 ^b	34 ^c	41 ^d	43 ^e	47 ^f	49 ^g	50 ^h	44 ⁱ	28 ^j	3 ^k	2 ^l

Standard errors in parentheses

Sources of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; World Bank. (2015, June). World Development Index

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

^b Comoros, Guinea, Guinea-Bissau, Lesotho, Madagascar, Mali, Seychelles, Sudan.

^c Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Cote d'Ivoire, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^d Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^e Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda.

^f Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia.

^g Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia.

^h Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia.

ⁱ Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Kenya, Liberia, Libya, Malawi, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

^j Algeria, Botswana, Cabo Verde, Chad, Congo, Dem. Rep., Congo, Rep., Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Ghana, Kenya, Liberia, Libya, Malawi, Mauritania, Morocco, Namibia, Nigeria, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Zambia, Zimbabwe.

^k Libya, South Africa, Zimbabwe.

^l South Africa, Zimbabwe.

Appendix 3-A2 – Fixed-Effects (Robust Standard Errors) Regression: Political stability (WGI Political Stability and Absence of Violence/Terrorism: Estimate) (lags (1)), direct and indirect tax, seigniorage, GDP per capita, urbanization, and current account balance

	All countries	Average Direct-to-Indirect Tax Ratio (1980-2013)							
		Less than				Greater than or equal to			
		4:10	5:10	6:10	5:10	6:10	7:10	9:10	5:10-6:10
	(R,E,D,Ext)	(R,E)	(R,E,D,Ext)	(R,E)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D,Ext)	(R,E,D)	(R,E,D,Ext)
L.Political Stability and Absence of Violence/Terrorism: Estimate	0.613*** (0.041)	0.569*** (0.040)	0.541*** (0.041)	0.570*** (0.046)	0.654*** (0.062)	0.634*** (0.103)	0.694*** (0.079)	0.790** (0.026)	0.648** (0.109)
Direct tax	0.0193* (0.010)	-0.00813 (0.024)	0.0121 (0.018)	0.00339 (0.016)	-0.0120 (0.021)	-0.0386 (0.025)	-0.0431 (0.023)	-0.103 (0.028)	0.0328 (0.047)
Indirect tax	-0.000723 (0.004)	-0.00842* (0.004)	-0.00942** (0.003)	-0.00783* (0.004)	0.0491* (0.020)	0.0683* (0.030)	0.0726* (0.028)	0.140* (0.031)	0.0310* (0.012)
Seigniorage ($\pi H/Y$)	-0.000111* (0.000)	-0.0000478* (0.000)	-0.0000467 (0.000)	-0.0000434 (0.000)	-0.000260** (0.000)	-0.000133* (0.000)	-0.000124 (0.000)	-0.000141 (0.000)	-0.000230 (0.000)
GDP per capita (constant 2005 US\$)	0.0000494 (0.000)	-0.0000523 (0.000)	0.0000234 (0.000)	-0.0000420* (0.000)	0.0000221 (0.000)	0.000176** (0.000)	0.000163* (0.000)	0.000174* (0.000)	-0.000114* (0.000)
Urban population (% of total)	-0.0224* (0.010)		-0.0252* (0.011)		0.00538 (0.021)	0.0113 (0.035)	-0.0563 (0.027)	-0.0755 (0.036)	0.00385 (0.015)
Current account balance (% of GDP)	0.00200 (0.001)		0.00208 (0.002)		0.00347 (0.003)	0.00211 (0.005)	0.00497 (0.005)		0.00567 (0.004)
Constant	0.624 (0.371)	-0.0485 (0.121)	0.882* (0.432)	0.0113 (0.094)	-0.644 (0.789)	-1.244 (1.513)	1.929 (1.388)	3.819 (2.467)	-0.119 (0.487)
r ²	0.430	0.363	0.349	0.351	0.593	0.671	0.716	0.843	0.601
No. of observations	372	184	247	313	125	77	57	24	48
Residual degrees of freedom	49	22	32	39	16	9	7	2	6
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-
No of countries	50(+1) ^a	23	33 ^b	40 ^c	17	10 ^d	8 ^e	3 ^f	7

Standard errors in parentheses

Sources of data: Wilson Prichard, Alex Cobham and Andrew Goodall. (2014, September). The ICTD Government Revenue Dataset; World Bank. (2015, June). World Development Index

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^a Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

^b Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Comoros, Congo, Dem. Rep., Cote d'Ivoire, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Togo, Uganda.

^c Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Togo, Tunisia, Uganda.

^d Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Kenya, Libya, Malawi, South Africa, Tanzania, Zambia, Zimbabwe.

^e Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Libya, Malawi, South Africa, Zambia, Zimbabwe.

^f Ethiopia, Libya, South Africa, Zambia, Zimbabwe.

^g Libya, South Africa, Zimbabwe.

Appendix 4-A1 – Two-Way Fixed Effects (Robust Standard Errors) Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), frequency of government change, internal conflict months, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
Frequency of government change (FGC)	-0.723 (0.380)	-0.767 (0.435)	-0.725 (0.461)	-0.687 (0.465)
Uppsala IntConfMonths	-0.131 [*] (0.052)	-0.135 [*] (0.056)	-0.140 [*] (0.065)	-0.135 [*] (0.066)
yr1981	-2.616 (1.378)	0 (.)	0 (.)	0 (.)
yr1982	-2.547 (2.370)	2.593 (2.368)	1.411 (2.833)	1.642 (2.798)
yr1983	-4.465 (2.894)	0.974 (1.837)	2.661 [*] (1.171)	3.455 ^{***} (0.924)
yr1984	-3.428 (2.766)	2.070 (1.917)	3.366 (1.829)	4.075 [*] (1.873)
yr1985	-3.003 (2.245)	2.560 (1.361)	3.122 [*] (1.481)	4.092 ^{**} (1.395)
yr1986	-3.320 (2.197)	2.287 (1.192)	2.832 [*] (1.320)	3.631 ^{**} (1.274)
yr1987	-2.823 (2.622)	2.905 (1.920)	3.217 (2.268)	3.838 (2.234)
yr1988	-3.017 (2.124)	2.689 (1.405)	2.684 (1.654)	3.358 [*] (1.593)
yr1989	-0.386 (1.801)	5.365 ^{***} (1.053)	5.517 ^{***} (1.168)	6.093 ^{***} (1.198)
yr1990	-2.420 (1.586)	3.462 ^{**} (1.193)	3.558 ^{**} (1.237)	4.094 [*] (1.216)
yr1991	-3.257 (1.923)	1.991 (1.828)	2.026 (1.878)	2.406 (1.878)
yr1992	-2.711 (2.118)	1.944 (1.637)	2.017 (1.683)	2.513 (1.649)
yr1993	-2.949 (2.145)	2.104 (1.684)	2.160 (1.723)	2.719 (1.664)
yr1994	-2.661 (2.088)	3.598 (2.131)	2.021 (1.561)	2.243 (1.571)
yr1995	-2.005 (1.323)	3.946 ^{**} (1.155)	3.749 ^{**} (1.270)	4.276 ^{**} (1.109)
yr1996	-0.613 (1.195)	5.141 ^{***} (0.952)	5.388 ^{***} (1.063)	5.906 ^{***} (1.060)
yr1997	-0.0918 (1.248)	6.264 ^{***} (0.958)	6.534 ^{***} (1.220)	7.092 ^{***} (1.202)
yr1998	-1.865 (1.421)	4.426 ^{**} (1.111)	4.727 ^{**} (1.031)	5.224 ^{**} (0.942)
yr1999	-2.542 (1.634)	3.390 [*] (1.398)	3.598 (1.229)	4.243 [*] (1.170)
yr2000	-0.283 (1.280)	5.324 ^{**} (0.795)	5.554 ^{**} (0.768)	6.150 ^{**} (0.668)
yr2001	-1.326 (1.358)	4.328 ^{***} (0.885)	4.513 ^{***} (0.875)	4.869 ^{***} (0.811)
yr2002	-1.411 (1.268)	4.323 ^{***} (0.672)	4.563 ^{***} (0.621)	4.972 ^{***} (0.533)
yr2003	-1.220 (1.247)	4.510 ^{**} (0.722)	4.745 ^{**} (0.775)	5.104 ^{**} (0.702)
yr2004	-0.0958 (1.279)	5.564 ^{***} (0.775)	5.831 ^{***} (0.825)	6.068 ^{***} (0.803)
yr2005	0.949 (1.491)	6.713 ^{**} (0.996)	7.068 ^{**} (0.966)	7.427 ^{**} (0.939)
yr2006	5.777 [*] (2.133)	11.52 ^{**} (1.801)	11.75 ^{**} (1.827)	11.70 ^{**} (1.654)
yr2007	1.935 (1.499)	7.707 ^{***} (1.126)	7.995 ^{***} (1.150)	8.217 ^{***} (1.071)
yr2008	1.575 (1.457)	7.329 ^{***} (1.065)	7.528 ^{***} (1.087)	7.745 ^{***} (1.083)
yr2009	-2.266 (1.328)	3.382 ^{**} (0.931)	3.349 ^{**} (0.980)	3.724 ^{**} (0.948)
yr2010	-0.837 (1.292)	4.737 ^{**} (0.911)	4.610 ^{**} (0.993)	4.948 ^{**} (0.942)
yr2011	-1.313 (1.405)	4.359 ^{**} (0.959)	4.297 ^{**} (1.068)	4.580 ^{**} (1.027)
yr2012	-0.330 (1.403)	5.196 ^{***} (0.916)	5.051 ^{***} (0.962)	5.512 ^{***} (0.850)
yr2013	-1.842 (1.358)	3.925 ^{***} (1.020)	4.029 ^{***} (1.106)	4.523 ^{***} (1.062)
L.GDP growth (annual %)		-0.0397 (0.058)	-0.0663 (0.047)	-0.0664 (0.053)
L.Seigniorage (π H/Y)			0.0000273 (0.000)	0.0000915 (0.000)
L.Net exports (Export-Import) % of GDP				0.0580 [*] (0.023)
Grants, excluding technical cooperation (BoP, % of GDP)				5.441 (4.168) ^{**}
Constant	-0.783 (1.165)	-6.399 ^{***} (0.774)	-6.406 ^{***} (0.772)	-6.572 ^{**} (0.756)
r2	0.152	0.173	0.190	0.206
No. of observations	773	753	725	720
Residual degrees of freedom	36	36	36	36
No. of countries	37	37	37	37

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

Appendix 4-B1 – Two-Way Fixed Effects (Robust Standard Errors) Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), Political Stability and Absence of Violence/Terrorism: Estimate, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
Political Stability and Absence of Violence/Terrorism: Estimate	1.595 (0.787)	1.456* (0.670)	1.678* (0.745)	1.413 (0.781)
yr1996	0 (.)	0 (.)	0.519 (1.281)	0.513 (1.292)
yr1997	0 (.)	0 (.)	0 (.)	0 (.)
yr1998	-1.237 (1.336)	-0.653 (1.258)	0 (.)	0 (.)
yr1999	0 (.)	0 (.)	0 (.)	0 (.)
yr2000	0.246 (0.963)	0.117 (0.994)	0.717 (0.890)	0.818 (0.904)
yr2001	0 (.)	0 (.)	0 (.)	0 (.)
yr2002	-0.816 (0.982)	-0.712 (0.971)	-0.0862 (0.840)	-0.161 (0.844)
yr2003	-0.683 (0.853)	-0.576 (0.848)	0.0223 (0.983)	-0.135 (0.985)
yr2004	0.412 (0.794)	0.364 (0.770)	1.016 (0.935)	0.798 (0.940)
yr2005	1.562 (0.901)	1.787 (0.977)	2.495 (1.284)	2.377 (1.251)
yr2006	6.341*** (1.706)	6.534*** (1.734)	7.092** (2.047)	6.416** (1.900)
yr2007	2.335* (0.914)	2.566* (0.951)	3.236* (1.241)	2.923* (1.196)
yr2008	1.941* (0.818)	2.124* (0.839)	2.727* (1.310)	2.402 (1.296)
yr2009	-1.950 (1.248)	-1.793 (1.193)	-1.365 (1.172)	-1.482 (1.216)
yr2010	-0.381 (1.088)	-0.419 (1.096)	0.0258 (1.365)	-0.227 (1.381)
yr2011	-1.083 (1.365)	-0.907 (1.323)	-0.471 (1.506)	-0.707 (1.543)
yr2012	0.0150 (1.042)	-0.198 (0.959)	0.247 (1.083)	0.201 (1.096)
yr2013	-1.354 (1.284)	-0.893 (1.237)	-0.349 (1.470)	-0.342 (1.480)
L.GDP growth (annual %)		-0.107** (0.038)	-0.108** (0.037)	-0.109* (0.042)
L.Seigniorage (π H/Y)			0.000301 (0.000)	0.000296 (0.000)
L.Net exports (Export-Import) % of GDP				0.0346 (0.019)
Grants, excluding technical cooperation (BoP, % of GDP)				7.062 (5.175)
Constant	-0.473 (1.097)	-0.234 (1.051)	-0.727 (0.983)	-1.011 (1.122)
r2	0.183	0.202	0.210	0.226
No. of observations	514	511	495	490
Residual degrees of freedom	36	36	36	36
No. of countries	37	37	37	37

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallenstein. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015;

World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

Appendix 4-B2 – Fixed Effects (Robust Standard Errors) Regression: Fiscal surplus (General government net lending/borrowing (Percent of GDP)), Political Stability and Absence of Violence/Terrorism: Estimate, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
Political Stability and Absence of Violence/Terrorism: Estimate	1.993*	1.850*	2.126*	1.692
	(0.893)	(0.775)	(0.854)	(0.838)
L.GDP growth (annual %)		-0.0956*	-0.0971*	-0.0993*
		(0.041)	(0.040)	(0.047)
L.Seigniorage ($\pi H/Y$)			0.000239	0.000260
			(0.000)	(0.000)
L.Net exports (Export-Import) % of GDP				0.0549*
				(0.024)
Grants, excluding technical cooperation (BoP, % of GDP)				11.04
				(6.773)
Constant	0.289	0.599	0.757	0.0313
	(0.732)	(0.776)	(0.794)	(0.991)
r ²	0.025	0.039	0.044	0.088
No. of observations	514	511	495	490
Residual degrees of freedom	36	36	36	36
No. of countries	37	37	37	37

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

Appendix 4-B3 – Two-Way Two-Step (Robust Standard Errors) System GMM Regression: Fiscal deficit (General government net lending/borrowing (Percent of GDP)), Political Stability and Absence of Violence/Terrorism: Estimate, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
L.General government net lending/borrowing (Percent of GDP)	0.0255 (0.124)	0.154 (0.243)	0.172 (0.129)	0.0500 (0.173)
Political Stability and Absence of Violence/Terrorism: Estimate	0.142	-0.468	-0.584	0.589
	(1.566)	(1.546)	(1.560)	(2.372)
yr1998	-38.49 (69.197)	-9.294 (30.299)	-8.882 (24.717)	-3.813 (24.063)
yr2000	-20.41 (28.431)	-6.873 (40.082)	-7.120 (24.314)	-1.159 (30.006)
yr2002	-0.225 (14.458)	4.979 (31.228)	4.319 (23.968)	5.196 (32.438)
yr2003	-0.0131 (14.167)	5.322 (29.440)	4.734 (23.460)	6.133 (31.825)
yr2004	1.077 (14.061)	5.991 (29.173)	5.393 (23.361)	6.770 (31.525)
yr2005	2.726 (14.256)	7.943 (33.012)	7.277 (24.204)	8.816 (31.357)
yr2006	7.617 (14.613)	11.68 (31.316)	10.82 (23.887)	13.34 (28.771)
yr2007	2.137 (15.116)	6.624 (30.461)	5.681 (23.488)	8.589 (29.132)
yr2008	2.028 (15.757)	7.504 (34.522)	6.539 (24.069)	8.151 (29.847)
yr2009	-1.030 (17.038)	4.120 (35.731)	3.141 (24.392)	4.807 (29.943)
yr2010	0.472 (17.905)	5.826 (41.460)	5.120 (25.724)	6.180 (31.288)
yr2011	-0.369 (19.914)	4.751 (43.469)	3.931 (24.622)	5.154 (31.301)
yr2012	1.049 (20.342)	5.212 (48.534)	4.335 (26.032)	5.931 (32.041)
yr2013	-0.663 (20.790)	4.708 (51.198)	3.964 (26.342)	5.708 (32.016)
L.GDP growth (annual %)		-0.164* (0.068)	-0.169* (0.069)	-0.141 (0.103)
L.Seigniorage (π H/Y)			0.000169 (0.001)	0.000752 (0.002)
L.Net exports (Export-Import) % of GDP				0.102 (0.088)
Grants, excluding technical cooperation (BoP, % of GDP)				-4.375 (21.678)
Constant	0.533 (15.460)	-5.580 (32.817)	-4.982 (22.888)	-5.018 (30.790)
No. of observations	501	498	483	478
No. of countries	37	37	37	37
No. of instruments	39	40	41	43
Hansen (p-value)	0.1529	0.1616	0.1644	0.1979
AR1 (p-value)	0.0350	0.0576	0.0092	0.0137
AR2 (p-value)	0.4144	0.3841	0.2413	0.3472
AR3 (p-value)	0.4058	0.5473	0.5578	0.3636
Wald chi2	54.51	35.14	48.49	67.69
Chi2 (p-value)	0.0000	0.0060	0.0001	0.0000

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

Appendix 4-B4 – Two-Step (Robust Standard Errors) System GMM Regression: Fiscal deficit (General government net lending/borrowing (Percent of GDP)), Political Stability and Absence of Violence/Terrorism: Estimate, lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
L.General government net lending/borrowing (Percent of GDP)	0.191*	0.287*	0.294*	0.175
	(0.087)	(0.113)	(0.124)	(0.097)
Political Stability and Absence of Violence/Terrorism: Estimate	1.092	0.0639	0.108	0.285
	(1.632)	(1.217)	(1.131)	(0.879)
L.GDP growth (annual %)		-0.208***	-0.215**	-0.202**
		(0.062)	(0.068)	(0.063)
L.Seigniorage (π H/Y)			-0.000778	-0.000604
			(0.001)	(0.001)
L.Net exports (Export-Import) % of GDP				0.140*
				(0.068)
Grants, excluding technical cooperation (BoP, % of GDP)				8.319
				(8.450)
Constant	-0.313	0.0550	0.370	0.927
	(1.672)	(1.286)	(1.238)	(1.467)
No. of observations	501	498	483	478
No. of countries	37	37	37	37
No. of instruments	28	29	30	32
Hansen (p-value)	0.2173	0.1388	0.1151	0.2168
AR1 (p-value)	0.0269	0.0128	0.0130	0.0081
AR2 (p-value)	0.1828	0.1411	0.1329	0.2157
AR3 (p-value)	0.2190	0.2592	0.2685	0.1994
Wald chi2	12.69	11.79	11.58	30.36
Chi2 (p-value)	0.0018	0.0082	0.0208	0.0000

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallenstein. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Algeria, Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Togo, Tunisia, and Uganda.

Appendix 4-B5 – Two-Step (Robust Standard Errors) System GMM Regression: Fiscal deficit (General government net lending/borrowing (Percent of GDP)), Political Stability and Absence of Violence/Terrorism: Estimate (with regional interaction variables), lag of real GDP growth rate, lag of seigniorage, lag of net exports, and grants

	(1)	(2)	(3)	(4)
L.General government net lending/borrowing (Percent of GDP)	0.115 (0.074)	0.220* (0.094)	0.221* (0.106)	0.154 (0.099)
Political Stability and Absence of Violence/Terrorism: Estimate	3.176 (2.592)	2.194 (2.534)	2.075 (1.711)	2.204 (2.560)
Interaction PolStabAbsViol*CentralAfrica	-12.90* (6.493)	-10.72* (5.024)	-11.31* (5.320)	-9.184* (4.127)
Interaction PolStabAbsViol*EastAfrica	4.940 (4.732)	4.063 (4.400)	4.395 (4.402)	2.835 (4.560)
Interaction PolStabAbsViol*NorthAfrica	-2.178 (2.785)	-2.261 (3.008)	-2.087 (2.324)	-2.019 (2.701)
Interaction PolStabAbsViol*SouthernAfrica	-1.918 (6.998)	1.058 (6.162)	1.552 (7.064)	0.900 (7.497)
L.GDP growth (annual %)		-0.196** (0.062)	-0.197** (0.064)	-0.189** (0.064)
L.Seigniorage ($\pi H/Y$)			-0.000454 (0.001)	-0.000487 (0.001)
L.Net exports (Export-Import) % of GDP				0.0930 (0.062)
Grants, excluding technical cooperation (BoP, % of GDP)				6.862 (8.172)
Constant	-0.160 (1.880)	0.0168 (1.487)	0.145 (1.368)	0.653 (1.946)
No. of observations	501	498	483	478
No. of countries	37	37	37	37
No. of instruments	32	33	34	36
Hansen (p-value)	0.2414	0.2180	0.2374	0.1788
AR1 (p-value)	0.0247	0.0101	0.0107	0.0086
AR2 (p-value)	0.1931	0.1460	0.1417	0.2082
AR3 (p-value)	0.2292	0.2621	0.2643	0.2089
Wald chi2	18.03	19.31	20.50	38.02
Chi2 (p-value)	0.0062	0.0073	0.0086	0.0000

Standard errors in parentheses.

Sources of data: IMF. (2015, April). World Economic Outlook; Pettersson & Wallensteen. (2015). The UCDP/PRIO Armed Conflict Dataset, Version 4-2015; World Bank. (2015, September). World Development Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Central Africa: Angola, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., and Congo, Rep.

East Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Mozambique, Rwanda, and Uganda.

North Africa: Algeria, Egypt, Arab Rep., Libya, Morocco, Sudan, and Tunisia.

Southern Africa: Lesotho and South Africa.

West Africa: Burkina Faso, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

Appendix 5-A1 – Panel Unit Root Test Results

Panel unit root test: Summary

Series: POLITICAL_STABILITY_AND_

Date: 12/08/17 Time: 02:37

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.1027	0.0000	53	570
Breitung t-stat	-0.13213	0.4474	53	517
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.79810	0.0001	53	570
ADF - Fisher Chi-square	170.276	0.0001	53	570
PP - Fisher Chi-square	200.452	0.0000	53	583

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(POLITICAL_STABILITY_AND_)

Date: 12/08/17 Time: 02:37

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-28.3374	0.0000	53	507
Breitung t-stat	-8.95176	0.0000	53	454
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-10.8386	0.0000	53	507
ADF - Fisher Chi-square	352.014	0.0000	53	507
PP - Fisher Chi-square	518.798	0.0000	53	530

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: UPPSALA_INTCONFMONTHS

Date: 12/08/17 Time: 02:39

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.25635	0.0000	37	1258
Breitung t-stat	-1.94383	0.0260	37	1221
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.15020	0.0000	37	1258
ADF - Fisher Chi-square	259.853	0.0000	37	1258
PP - Fisher Chi-square	271.770	0.0000	37	1258

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(UPPSALA_INTCONFMONTHS)

Date: 12/08/17 Time: 02:39

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 6

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.4864	0.0000	27	918
Breitung t-stat	-9.76984	0.0000	27	891
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-26.6501	0.0000	27	918
ADF - Fisher Chi-square	805.937	0.0000	27	918
PP - Fisher Chi-square	2051.28	0.0000	27	918

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: FREQUENCY_OF_GOVERNMENT_

Date: 12/08/17 Time: 02:41

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 3

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-30.5026	0.0000	52	1768
Breitung t-stat	-17.2901	0.0000	52	1716
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-30.8561	0.0000	52	1768
ADF - Fisher Chi-square	886.440	0.0000	52	1768
PP - Fisher Chi-square	1914.95	0.0000	52	1768

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(FREQUENCY_OF_GOVERNMENT_)

Date: 12/08/17 Time: 02:41

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 6

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-22.6416	0.0000	46	1564
Breitung t-stat	-10.1413	0.0000	46	1518
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-42.9844	0.0000	46	1564
ADF - Fisher Chi-square	1546.64	0.0000	46	1564
PP - Fisher Chi-square	10898.4	0.0000	46	1564

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TOTNATRESRENT_TOTTAX

Date: 12/08/17 Time: 02:42

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-35.8563	0.0000	53	1456
Breitung t-stat	-6.2E-11	0.5000	53	1403
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.8921	0.0000	52	1454
ADF - Fisher Chi-square	582.842	0.0000	52	1454
PP - Fisher Chi-square	894.210	0.0000	52	1482

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(TOTNATRESRENT_TOTTAX)

Date: 12/08/17 Time: 02:42

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-57.1006	0.0000	52	1394
Breitung t-stat	-10.2435	0.0000	52	1342
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-41.5836	0.0000	52	1394
ADF - Fisher Chi-square	1391.71	0.0000	52	1394
PP - Fisher Chi-square	3377.63	0.0000	52	1419

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: SEIGNIORAGE__PH_Y_
Date: 12/08/17 Time: 02:43
Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-229.482	0.0000	52	1546
Breitung t-stat	-11.6970	0.0000	52	1494
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-54.4814	0.0000	52	1546
ADF - Fisher Chi-square	755.431	0.0000	52	1546
PP - Fisher Chi-square	1071.45	0.0000	52	1561

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(SEIGNIORAGE__PH_Y_)
Date: 12/08/17 Time: 02:43
Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-170.373	0.0000	52	1519
Breitung t-stat	-13.0357	0.0000	52	1467
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-68.6987	0.0000	52	1519
ADF - Fisher Chi-square	1611.71	0.0000	52	1519
PP - Fisher Chi-square	8712.81	0.0000	52	1542

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: GENERAL_GOVERNMENT__NET_L
Date: 12/08/17 Time: 02:44
Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 7
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	27.9124	1.0000	53	1001
Breitung t-stat	-8.6E-12	0.5000	53	948
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.15731	0.0000	52	999
ADF - Fisher Chi-square	249.698	0.0000	52	999
PP - Fisher Chi-square	210.159	0.0000	52	1035

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(GENERAL_GOVERNMENT__NET_L)
Date: 12/08/17 Time: 02:45
Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 6
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.7869	0.0000	52	945
Breitung t-stat	-11.4868	0.0000	52	893
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-20.0383	0.0000	52	945
ADF - Fisher Chi-square	658.453	0.0000	52	945
PP - Fisher Chi-square	1883.69	0.0000	52	983

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDP_GROWTH__ANNUAL____N

Date: 12/08/17 Time: 02:46

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.5565	0.0000	54	1671
Breitung t-stat	-15.2813	0.0000	54	1617
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-22.4071	0.0000	54	1671
ADF - Fisher Chi-square	856.097	0.0000	54	1671
PP - Fisher Chi-square	1257.44	0.0000	54	1672

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(GDP_GROWTH__ANNUAL____N)

Date: 12/08/17 Time: 02:46

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-29.1399	0.0000	53	1642
Breitung t-stat	-18.9121	0.0000	53	1589
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-41.3238	0.0000	53	1642
ADF - Fisher Chi-square	1594.19	0.0000	53	1642
PP - Fisher Chi-square	9143.74	0.0000	53	1654

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: FINAL_CONSUMPTION_EXPEND

Date: 12/08/17 Time: 02:47

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 5

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-156.150	0.0000	51	1503
Breitung t-stat	-4.1E-11	0.5000	51	1452
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.36848	0.0000	50	1501
ADF - Fisher Chi-square	228.128	0.0000	50	1501
PP - Fisher Chi-square	222.577	0.0000	50	1506

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(FINAL_CONSUMPTION_EXPEND)

Date: 12/08/17 Time: 02:48

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1953.97	0.0000	51	1476
Breitung t-stat	-5.3E-10	0.5000	51	1425
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-27.7327	0.0000	50	1474
ADF - Fisher Chi-square	1091.20	0.0000	50	1474
PP - Fisher Chi-square	3325.23	0.0000	50	1487

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: DOMESTIC_CREDIT_TO_PRIVA

Date: 12/08/17 Time: 02:49

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.45223	0.6744	52	1554
Breitung t-stat	4.69898	1.0000	52	1502
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.65156	0.9507	52	1554
ADF - Fisher Chi-square	117.533	0.1720	52	1554
PP - Fisher Chi-square	73.7166	0.9893	52	1578

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(DOMESTIC_CREDIT_TO_PRIVA)

Date: 12/08/17 Time: 02:50

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 5

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-23.6658	0.0000	52	1536
Breitung t-stat	-14.8404	0.0000	52	1484
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-27.1366	0.0000	52	1536
ADF - Fisher Chi-square	945.741	0.0000	52	1536
PP - Fisher Chi-square	1658.69	0.0000	52	1555

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: SCHOOL_ENROLLMENT__SECON

Date: 12/08/17 Time: 02:51

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 3

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	6.79587	1.0000	49	922
Breitung t-stat	6.35568	1.0000	49	873
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	7.05368	1.0000	49	922
ADF - Fisher Chi-square	51.2208	1.0000	49	922
PP - Fisher Chi-square	51.8107	1.0000	49	968

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(SCHOOL_ENROLLMENT__SECON)

Date: 12/08/17 Time: 02:52

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-16.2561	0.0000	47	827
Breitung t-stat	0.83171	0.7972	47	780
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.65647	0.0000	47	827
ADF - Fisher Chi-square	282.437	0.0000	47	827
PP - Fisher Chi-square	310.728	0.0000	47	864

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: FOREIGN_DIRECT_INVESTMEN

Date: 12/08/17 Time: 02:53

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 6

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.55021	0.0000	53	1606
Breitung t-stat	-0.33925	0.3672	53	1553
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.1968	0.0000	53	1606
ADF - Fisher Chi-square	378.924	0.0000	53	1606
PP - Fisher Chi-square	415.636	0.0000	53	1621

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(FOREIGN_DIRECT_INVESTMEN)

Date: 12/08/17 Time: 02:53

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 7

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-30.5802	0.0000	53	1577
Breitung t-stat	-2.37221	0.0088	53	1524
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-38.0143	0.0000	53	1577
ADF - Fisher Chi-square	1396.77	0.0000	53	1577
PP - Fisher Chi-square	5819.89	0.0000	53	1600

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: MERCHANDISE_TRADE____OF_

Date: 12/08/17 Time: 02:54

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.00227	0.0000	52	1679
Breitung t-stat	-3.74812	0.0001	52	1627
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.31802	0.0005	52	1679
ADF - Fisher Chi-square	149.552	0.0023	52	1679
PP - Fisher Chi-square	149.699	0.0022	52	1682

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: D(MERCHANDISE_TRADE____OF_)

Date: 12/08/17 Time: 02:54

Sample: 1980 2013

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 5

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-33.9280	0.0000	52	1652
Breitung t-stat	-24.0903	0.0000	52	1600
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-35.6743	0.0000	52	1652
ADF - Fisher Chi-square	1118.97	0.0000	52	1652
PP - Fisher Chi-square	2920.91	0.0000	52	1668

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.