ECONOMIC RESEARCH FORUM

منتدى البحوث الاقتصادية

2016

working paper series

THE POLITICAL ECONOMY OF FISCAL INSTITUTIONS AND MACROECONOMIC MANAGEMENT IN SUDAN

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Working Paper No. 1044

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September 2016

This paper prepared is for the Economic Research Forum's, ERF, collaborative project on: 'Fiscal Institutions and Macroeconomic Management in Resource-Rich Arab Economies'. I am grateful to Professor Jeffrey B. Nugent; University of Southern California, USA, for the opportunity to write the paper; and for his generous and constructive comments that help me to develop it into its present form. The financial support from the ERF under the Research Initiative on Arab Development (RIAD) is duly acknowledged. I am responsible, however, for the views expressed and the errors.

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First published in 2016 by
The Economic Research Forum (ERF)
21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

Abstract

The literature on distributive politics indicates that many low-income countries are saddled with extractive institutions that not only contribute to politically biased fiscal outcomes, but tend to undermine long-run real growth. An analytical narrative based on the critical juncture and path dependence general equilibrium approach is utilized to highlight the effects of the political institutions on the fiscal policy outcomes in Sudan and indicate their mechanisms of perpetuation. The results suggest that Sudan has experience two critical junctures that featured, respectively, the path-dependence of public source of finance and budgeting based on cotton and its eventual destruction. The political patronage appears to be the major mechanism of reproduction of the 'path dependent' state development including the source of public revenue. But, the greater centralization of power and parsonage networks has resulted in problematic incorporation of the rural communities triggering a process of territorial fragmentation that escalated into open civil wars, contributed to the cumulative decline of the historic source of public finance and eventually led to the breakup of the state. The policy implications of these findings are outlined.

JEL Classifications: E6, O2, H3

Keywords: Fiscal Policy; Political Economy; Sudan

ملخص

أدبيات السياسة التوزيعية تشير إلى أن العديد من البلدان ذات الدخل المنخفض والمثقلة بالمؤسسات الاستخراجية التي لا تسهم في تحقيق نتائج مالية منحازة سياسيا فقط، ولكن تميل إلى تقويض النمو الحقيقي على المدى الطويل. ويستخدم السرد التحليلي استنادا إلى نهج التوازن العام الحاسم المنعطف ومسار التبعية لتسليط الضوء على الآثار المترتبة للمؤسسات السياسية على نتائج السياسة المالية في السودان وتشير الى استمرار آلياتها. وتشير النتائج إلى أن السودان لديه خبرة اثنين من المراحل الحاسمة التي ظهرت، على التوالي، في مسار الاعتماد على المصادر العامة للتمويل ووضع الميزانية على أساس القطن وتدميرها في نهاية المطاف. تظهر المحسوبية السياسية لتكون آلية رئيسية لإعادة إنتاج "مسار تعتمد" تنمية دولة بما في ذلك مصدر الإيرادات العامة. ولكن، تؤدى المركزية الأكبر لشبكات الكهرباء في تأسيس إشكالية المجتمعات الريفية مما اثار عملية التفتيت الجغرافي الذي تصاعد إلى حروب أهلية مفتوحة، والتي ساهمت في الانخفاض التراكمي للمصدر التاريخي للمالية العامة وتؤدى في النهاية إلى تفكك للدولة. وترد الآثار السياسية المترتبة على هذه النتائج.

1. Introduction

Fiscal policy is crucial for achieving at least the three classic goals of macroeconomic stability, operational efficiency and efficient resource distribution. Market stabilizing institutions, such as budgetary and fiscal rules, are at the heart of sound fiscal performance as suggested by Roderick and Subramanian (2003). The political elite can configure these institutions to stabilize the economy, correct market failure and provide broad-based public goods; or abuse them in distributive politics with winners and losers. Global experience shows that, good fiscal outcomes (for example economic stability, sustainable fiscal balance and efficient delivery of high quality public service) are predicated on the quality of the political institutions governing the budget process. The literature on the fiscal institutions in the context of the low income countries (LICs) is relatively new, and originates to a large extent from the field work of donors and development agencies. An important conclusion from this literature is that, the quality of fiscal institutions is the most important factor that shapes the fiscal outcomes, (Dabla-Norris et al, 2010). Also, the Alesina and Perotti (1995) survey of the literature on politico-institutional determinants of the budget in the OECD economies showed that actual budgets are not dictated by the principles of optimal taxation, but are decided by political processes; and hence, influenced primarily by electoral systems, party structure, government fragmentation, and political polarization. In addition, the survey in Tabellini (2004) showed that; high participation rates in elections, lack of ideological extremism and low identification with ethnicity are more likely to raise the opportunity costs for corrupt elite, and hence discourage the incentives to appropriate rents through distributive politics.

As noted in Weingast et al, (1981), the literature on distributive politics, takes the historical origins of and rationales for the state's political institutions as fixed and exogenous, the main focus being on how the public policymaking process governed by these institutional rules determine the observed fiscal outcomes, (see also Golden and Min 2013). However, it is arguable that, the rules of the game, that is, the 'state's institutions', condition the roles of the state-actors as well as the broad developmental outcomes in the LICs in fundamental ways. For example, the cross-country study by Hall and Jones (1999) showed that countries with better state institutions accumulate more capital and have much higher output per worker. The question that follows is how and to what extent good institutions can be acquired by a LIC such as Sudan? Recent influential literature provided an answer by showing that the quality of institutions is robustly determined by the colonial history of countries, (Easterly and Levine 2002; Acemoglu et al, 2001 and Acemoglu et al, 2012).In particular, Acemoglu and Robinson (2001, 2006 and 2012) postulate a dual approach of institutional development, in the context of historical institutionalism and associated critical junctures, to explain the very divergent structures and development pathways of the ex-colonized territories. According to this theory, the colonial experiences crystallized the major events- critical junctures- that disrupt the existing political and economic balances and set nations in divergent dependent paths. The general pattern was that, in the settled territories, where the colonizers transplanted their economic and political institutions, inclusive institutions evolved and the nations have succeeded economically after independence; while the colonies exploited for resource extraction; especially in Africa, Central America, the Caribbean, and South Asia; developed extractive institutions and, over time, their economies have tended to stagnate. Thus, institutions can create prosperity through 'positive feedback' loops or set a poverty trap through 'negative feedback' loops. The dual approach, that is the critical juncture and the path-dependent process it instigates, is widely applied in macro politics and cross-country comparisons. Nevertheless, the approach can also be used in the context of a single case to explore the causal mechanisms linking outcomes to institutions and to examine situations in which radical institutional change happens, (Acemoglu and Robinson 2012 and Capoccia 2015). Sudan depends on mono-export from natural resource, has experienced protracted civil conflicts and wars, and in 2011 the state institution itself has fragmented. This chapter aims to explore the setup of Sudan's extractive industries and highlight the associated political institutions and socio-spatial networks. Understanding the ways in which the path-dependent institutions mediated the elite's conflicts and bargains is important in examining the dynamics of decision-making and the outcomes of policy programs. Thus, the analysis focuses on the arena and the process of the policymaking. The question of interest is not to explain a single policy change but to understand the nature of the institutional change in general and how policy outcome is determined. Although Sudan was governed by two colonial regimes; the Turco–Egyptian colonial rule (1821-1885) and the Anglo- Egyptian Condominium rule (1898-1956), the analysis focused on unpacking the latest colonial juncture, in order, to understand the "structural' factors that influenced the policy goal-setting by the colonial officials; and secondly to identify the mechanisms that reproduced the colonial legacy. The following main questions are addressed; who were the key policymakers; what are the policy decisions that led to setup of the extractive industries in Sudan and what are the major continuity-ensuring mechanisms? What are the policy goals pursued by the state elite after independence and why the reform efforts failed to change the path-dependence of the economic extractive institutions anchored in natural resource rent, the defining character of rentier states, and setup a centralized state capable of delivering and sustaining normative developmental goals? How the political factors and fiscal institutions affect the fiscal outcomes and macroeconomic management? And why has the state failed even to sustain itself rather than fragmenting in 2011?

The Method of analysis used is the analytical narrative based on the dual approach combining qualitative and quantitative information. Hence, the method is sequential; it starts from the state institutions, as power subjects that can promote or undermine the politico-economic and socio-spatial networks, and looks forward to assess their impact on the policy process and policy outcomes. The dual approach largely assumes that the material distribution of people in relation to resources is exogenous. However; the organizations of social cleavages, political contestations and even open wars around territorial identity involving place have a long history in Sudan. Hence, in order to account for the resource-people networks, the analysis drew insights from Martin and Sunley's (2006) argument that in many important aspects, path dependencies and lock-in equilibriums are place-dependent processes, and as such have geographical explanations. This is in contrast to earlier literature that focused on cross-country studies and hence accorded geography no agency role in development, (Hall and Jones 1999, Acemoglu and Robinson 2001, Easterly and Levine 2002, and Rodrik et al 2004). Geography defined here as place (locale) and space, that is, the networking of locales. No doubt the socio-spatial networks are produced by the dynamics of 'social contentions and bargains and they also affect the working of these dynamics. Hall's (1993) three-tiered approach to policy learning is employed-to focus the analysis on the key components of the critical juncture/path dependency framework, which can be decomposed into an exogenous shock, ideational change and a paradigm change, i.e. the emergence of new self-sustaining and incremental development process, (Hogan and Doyle 2007).

The evidences, from the valuable though limited literature on the distributive politics in the LICs, suggest that the credibility of policy commitment tends to deteriorate in the natural resource–dependent economies dominated by powerful and fragmented groups. And that the patron-client system eventually evolves as major mechanism reproducing the elite's exclusionary power base and capture of the state leading to lower resource rent, (Karl, 1997; Lane and Tornell, 1996; Strulik, 2012; Akitoby et al, 2008; Szarowská, 2012 and Acemoglu et al, 2012). The political patron-client relationships are informal, and thus, like other rent-seeking behaviors, their ultimate effect on shaping the fiscal institutions, especially the budget process and the fiscal outcomes cannot be directly assessed. An indirect test is motivated by the distributive politics theories developed by Weingast et al, (1981) and Strulik, (2012), (see section 2.2). Both theories explain the causes of inefficient high spending, excessive deficit and high public debt in terms of political economy variables and are consistent with the prediction of the patron-client model that, the political elites use the public resources to benefit themselves and their supporters without consideration to the costs inflicted on the economy at large. In particular, Weingast et al (1981) hypothesized that, public expenditure, the size of the deficit and level of debt are inclined to increase in the number of districts represented and with demands of the clients a phenomenon that is termed government "fragmentation". Also, Strulik (2012) showed that powerful competing groups in a polity tend to appropriate too much- i.e. behave voraciously- if the polity is highly factionalized and the rules of law as well as the institutions protecting property rights are not effective. The hypothesis that follows is that, the appropriating groups will 'overreact' to a positive productivity shock such that the triggered increase in the speed of appropriation exceeds the gain in productivity. Both hypotheses are tested for Sudan, respectively, by Granger causality and cointegrated vector autoregression (VAR) methods. Tables (4) and (5) highlight the respective models and the results of the estimation.

The analysis of the dual approach revealed that the legacies of the Turco–Egyptian colonial rule, the Mahdist state and the Anglo-Egyptian Condominium rule all have played significant role in shaping the development pathway of Sudan after independence. But, the historic sunk cost of investment in irrigated cotton coupled with the positive pecuniary externalities accruing from the linkages with commercial and traditional agriculture: (small-scale sedentary farming, agro-pastoralism and nomadic pastoralism) have created an efficient 'lock in' in the extractive economy driven by increasing returns. Cotton production in the Gezira scheme, the fertile plain of 2.5 million acres south of Khartoum, became the major driver of the economic growth. The scheme was characterized by unique production relations based on the state-farmers' partnership and also laid the basics of an efficient public budgeting. For example, fiscal planning, comprehensive and centralized budget including internal and external audit have evolved with scheme since early 1930s. Subsequent development plans up to early 1980s focused on expanding irrigated agriculture including cotton by replicating the Gezera model.

However, the inherited state's economic institutions were overtime restructured around extractive political institutions that concentrated power and wealth in the hands of narrow and conflicting elite groups. This outcome was achieved by strengthening the overall authoritarian control of the state through greater centralization and bureaucratization of the rural communities. In particular, the Constitution introduced in 1973 endorsed state socialism; and the representation of local elites is recognized through Sudan Socialist Union, the only sanctioned party that also elects the President leading to gradual rollback of the native administration. In addition, the enactment of the Civil Transaction Act in1983 has standardized the management of land usufruct rights 'and restated the state's control over land. These changes had created institutional chaos in the rural economy by disrupting the internal balances of power among the agro-pastoralists and pastoralists communities, where the customary authorities and laws play crucial roles in the management and distribution of the local geographical assets. The successive droughts shocks of mid 1980s, which coincided with chaotic and weak native administration, featured a new critical juncture that set the country's historic capital accumulation model into decreasing returns to scale that eventually culminated in the collapse of cotton, the main source of revenue and foreign exchange earnings. The juncture was preceded by poor economic performance, the introduction of the Islamic Sharia laws in 1983 and the outbreak of the war in South Sudan in the same year. Following the onset of the drought, the local communities exhibited large differences in their responses. The localities that are historically characterized by diversified administrative and territorial economic structures, mainly in rain-fed traditional agriculture, tend to stagnate. The centrally controlled local government hierarchy failed to coordinate the transboundary movements of the agro-pastoralists, pastoralists and nomadic herders from lagging localities to others in pursuit of better opportunities, which led to unprecedented proliferations of boundary disputes, especially in Darfur and Kordofan. By 1987 these contestations over resources escalated into open civil war, adding to the already existing war in the south. The rural-based nature of the escalating civil conflicts and wars has led to serious erosion and weakening of the local agricultural markets 'linkages that are the sources of the increasing returns and comparative advantage of irrigated cotton.

The policy ideas expounded by the political elite in response to the crisis triggered by the droughts have focused on 'economic salvation' and soon after on 'national salvation'. Clearly salvation is about rescuing from the crisis that worsened the already dire economic situation rather than about applying results of innovation. The former reform idea was initiated by an elected government that prevailed over 1986 to 1989, and was based on the standard recipes of economic orthodoxy, while the latter reform idea was introduced by a National Salvation Revolution following the 1989 military coup and it reigned for about a decade advocating the universalism of Islam, as in the Mahdist state. The major objective is to reinvigorate Jihad in the context of broader Popular Arab and Islamic Congress (PAIC) party aiming, among other things, to impose military victory on the various fighting rebel groups in the country, (Burr and Collins 2003). Although both reform-ideas were integrated into the policy process, they failed to resuscitate the rural-urban market linkages underlying the Gezera project, the backbone of the economy, and or coordinate an alternative investment program geared to promote sustainable source of public revenues and inclusive growth. On the contrary the intensification of the war against the rebels especially in decade following the military coup has further accelerated the collapse of Gezera project resulting in the most turbulent period in modern history of Sudan. Thus, the exploitation of oil discovered by Chevron in 1974 became inevitable as alternative resource for the elite survival. But the high costs of protecting the oil pipelines connecting the oil fields, mostly in the south, to the export port against the rebels 'attacks necessitated the integration of the fighting groups into the ruling coalition, (Azam 2015). This adjustment had led to the factionalization of the PAIC into the National Congress Party, the champion of peaceful integration of the rebels and the People Congress Party that joined the opposition. However, this quick-fix, similar to previous reform ideas, failed to deliver a transformative juncture as South Sudan seceded in 2011 ushering the collapse of the oil boom prompting the search for an alternate revenue source.

Moreover, the results imply that, the growing pressures for spending on the patronage networks exercise a strong influence on the budget process, which not only undermined the credibility of fiscal policy and delayed reforms; but translated into adverse political incorporation as manifested by the rural-based wars and high violence that culminated in the secession of South Sudan. Overall, it appears that the evolution of the state in post-independence Sudan depicts the general pattern of extractive states dominated by narrow base elites as predicted by Acemoglu and Robinson (2001) and others for the ex-colonies.

Thus, policymakers need to simultaneously pursue political and economic reforms. Obviously, peace is the most important public good for Sudan; sustaining existing peace deals and resolving the ongoing conflicts are top priority. Political reform should sanction the rules of law and the system of meritorious professional civil service that are crucial for effectiveness fiscal institutions and the fiscal policy. No doubt the huge infrastructure gap created by the long civil wars and the structural shift of agriculture from irrigated cum rain-fed traditional mode of production towards rain-fed agriculture dominated by livestock requires clear prioritization of the agricultural infrastructure in the budget. The policymakers need to appreciate that the cost of distance looms high in Sudan and that before independence the share of infrastructure (roads, irrigation and improved water) in total budget was sustained at more than 60% for more than three successive decades in order to incorporate the cotton farmers.

The rest of the chapter is organized as follows: the next section, (section 2), outlines the analytical framework and the methodology. Section (3) accounts for the major policy-decisions that led to the setup of Sudan's public finance on the basis of state-controlled production of irrigated cotton, and section (4) describes the major development plans that contributed to the lock-in in cotton. Section (5) explains the factors that set the county's main extractive industry and source of revenue into circular and cumulative process of decline and indicates how subsequent policy ideas failed to mitigate the crisis and largely fed the process of decay. Section (6) analyses the historical budget data to evaluate the extent to which the budget choices made by the elites prioritized political patronage over macroeconomic stability, fiscal solvency and long-term growth. The final section provides the conclusions and outlines the policy implications.

2. The Analytical Framework and Methodology

2.1 The analytical framework

It is widely argued that, while the dual approach, critical juncture - path dependence, acknowledges the importance of the embedded structures,' the antecedent conditions', they were usually confined to the backdrop during the analyses of the critical junctures by emphasizing the driving power of the agency and contingency (Slater and Simmons, 2010 and Soifer 2012). Although structure is ambiguous and highly contested term in the broad social science literature (see Sewell 1992 and Capoccia 2015), it is narrowly defined here, following Martin and Sunley's (2006) argument, as crystallized networks formed by economic and socio-spatial interactions. These networks might be determined by contingent events or by the interactions of agents' choices in concrete space and time, and can be reinforced by positive or negative feedbacks. Thus, the general equilibrium framework implied by the path dependence ('lock in' in equilibrium driven by increasing or decreasing returns of the socio-spatial networking) and the critical conjure (delinking from equilibrium) is followed to conceptualize the role of structure and agent in the evolution of the economic and political extractive institutions in Sudan. Notwithstanding, the theories of endogenous institutional change, due to Thelen (2004) and Mahoney and Thelen (2010), criticize the dual model as displaying a "stability bias," which consigns change to exogenous shocks. According to these theories institutions are 'arenas of conflict' rather than equilibria. Also, researchers studying weak institutions argue that path dependence assumes institutional strength- namely, high persistence and enforcement of formal rules in a polity- which is highly inhibited in the LICs, where the politics of institutional weakness is the typical pattern. In such situations institutional change often takes the form of "breakdown and replacement" ((Levitsky and Murillo 2005 and Capoccia 2015). However, it is arguable that the conditions under which each of these theories applies need to be time and place specific. Moreover, whether the institutional changes are innovations down the old path or result in divergences can be tested by the dual approach. In this regard the knowledge of the mechanisms propagating the path-dependence becomes important.

2.2 The methodology

The Method of analysis used is the analytical narrative, in the context of the dual approach to account for the events that led to the development of Sudan's mono-export based on irrigated cotton. And to show how overtime the policy choices made by the elites failed to deliver efficient fiscal outcomes and set the underlying development pathway into a decreasing retunes loop that is difficult to alter. In this regard, it should be noted that the identification; the timing and level of significance of the changes that establish a critical juncture instigating powerful lock-in mechanisms present grave challenge. However, following the literature, the critical juncture is defined as accumulation of related events during a brief time period of structural fluidity and heightened crisis that lead to long-lasting path dependence, *(Capoccia and Keleman 2007)*. Most scholars invoke the concept to identify political break points or economic crises as triggers of the path dependence; defined as a process of cumulative causations, (Mahoney and Thelen 2010). Acemoglu et al (2008) define the critical junctures and their occurrence as including, "the early stages of colonization for former colonies; the aftermath of independence or the founding of a nation; the epoch of the collapse of feudalism for Western European nations; the age of industrialization (i.e., the nineteenth century) and the periods of significant ideological shocks such as the Reformation, the Enlightenment, or the rise of Islam, p 830". Hogan and Doyle (2007) claimed that the critical juncture framework can be unwieldy particularly in the study focusing on a single country. However, they proposed a critical juncture framework drawing from *definition of the juncture of Capoccia and Keleman (2007) and the* three-tiered *approach to policy learning of Hall (1993). Their method is adopted to focus the analysis on the key components of the critical juncture to be unpacked, which can* be described as consisting of an exogenous shock, ideational change and a paradigm change. In this context, a new paradigm refers to radical disjuncture that leads to break away from the old path dependent process. It should be noted that in the framework proposed by Hogan and Doyle (2007) new idea plays driving role in the paradigmatic change leading to shifts in the underlying structure.

The crisis searched for here relates to the major events (abstracting from small accidents) that can trigger structural fluidity and institutional flux, which in turn, give rise to new alternative and path dependent process. The duration of the critical juncture must be brief relative to the duration of the legacy that it instigates*, (Capoccia and Keleman (2007).* As noted by these authors, treating a whole decade as a critical juncture with respect to an outcome observed a century later might be sensible, but the reverse is clearly not sensible. During crises, the different *ideas propagated by* different *political entrepreneurs* will act as either carriers or barriers to the needed policy changes. In this respect, Hall's (1993) identified three types of policy transformation. Respectively, these are: first-order policy change, which represents routine adjustments of instrument setting in the light of experience and new knowledge, while the overall goals and instruments of policy remain the same, e.g. experimenting with existing incremental budgeting. The second order change involves changing the instruments of policy without changing the policy goals e.g. strict commitment to medium term fiscal strategy framework. The first and second order changes preserve the continuity of the structure and hence accord agents and contingency high role in the policy change. The, third order change denotes intermittent moments of fundamental *disjuncture leading to break* away from the path *dependent policies. The* level of significance of the critical juncture leading to third order policy change is assessed in terms of the resultant long-lasting and self-sustaining structural change. That is, the exogenous shock is assumed to set the *dynamics* of the socio-economic and spatial networks into increasing or decreasing retunes loop. The analytic narrative tracks the observable implications of the dual model combining qualitative and quantitative information drawing from the relevant studies and secondary sources. *The proposed dual approach* nests the standard models of distributive politics as reproduction mechanisms of the path dependent budgetary and fiscal institutions. Variants of these mechanisms are also discussed in the literature on natural resource dependent countries, (Karl, 1997). Although Weingast et al's (1981) model provides political economy explanation for the inherent common pool problem of public budgeting in context of stable institutions; it is also relevant for elucidating the legislative bargaining behaviors and coalition building in weak states. It is expected that the pressures for oversupply of the goods needed for patronage exchange are more effective in fragmented polity dominated by powerful but narrow-base and conflicting elite. Weingast et al (1981), hypothesized that, the incomplete internalization of the social costs of public spending tends to worsen the higher the *number of represented* constituencies in the legislature; *and that this will translate into larger inefficient projects and higher spending;* a phenomenon termed the 'law of 1/n' and also government "fragmentation". In empirical literature the government size fragmentation is measured by variables such as the number of seats representing each electoral constituency in the legislature; the effective number of parties participating in the government; and, or, the fragmentation of the executive e.g. number of ministries and spending departments, (see e.g., Velasco, 2000; von Hagen and Harden, 1995 and Kontopoulos and Perotti, 1999). Due to data limits, the number of legislators over 1959-2013 is used to examine the effects of the government size fragmentation on causing fiscal biases, that are manifested in high spending, large fiscal deficit and excessive public debt. Since independence, nine political regimes aided with twenty elected or appointed legislative assemblies, (see table 2); together with over 1270 ministers have ruled Sudan inspiring ideology and legitimacy from sectarianism, secularism, socialism, *pan Arabism* and Islamism. Presumably, all legislative assemblies, elected or appointed, have *passed* laws including tax laws, approved budgets and *voraciously lobbied* for increased spending to improve the wellbeing of people as well as for sustaining the patron-client redistribution. Also, the large accumulative number of the ministers since independence, about 18% of all the civil servants at independence, clearly reflects the extent of elites' fragmentation and the *patron-client bargains.* However, the legislature size is used to test for the presence of the political *fiscal biases,* especially that the personal connections between the legislators and voters/constituencies are stronger in the context of patron-client system. The test is based on bivariate Granger causality technique in the context of cointegration and vector error correction modelling to better track the data. The existence of significant unidirectional causation running from the legislature size to the government spending, the deficit and public debt will confirm the perditions of the government fragmentation. Table (4) outlines the empirical model for testing the null hypothesis of no causality.

Moreover, it is expected that, a fragmented and conflict-ridden political system with little respect for property rights creates pressures for voracious behavior as described in Strulik's (2012) model, which extended Lane and Tornell's (1996). It is shown therein that powerful competing groups in a polity tend to appropriate too much- i.e. behave voraciously- if the polity is highly factionalized and the rules of law as well as the institutions protecting property rights are not effective. In Lane and Tornell's (1996) model growth falls due to declined savings, while in Strulik's (2012) extension it falls as a result of the very high discount rate owing to high uncertainty and low enforceability of property rights, especially when the natural resources elicit political contest to capture ownership. In post-independence Sudan experienced protracted civil conflicts and two major episodes of productivity growth driven by the inflow of foreign capital in the 1970s and oil windfall over 1999-2011. Many peace agreements for redistribution and power-sharing are signed, as featured in the Addis Ababa peace Act, 1972; the Comprehensive Peace Agreement, 2005; the Eastern Sudan Peace Agreement, 2006; and Darfur Peace Agreement, 2011. However, peace building is the most valuable public good for Sudan; it remains largely uncoordinated and basically sought by way of coalition building for elite survival (Ahmed, 2008; Simmons and Dixon, 2006; and Azam, 2015). As noted by De Waal (2014b), since independence, no peace agreement has been signed during periods of economic stagnation and shrinking budgets; which implies that the strategic choices of the contesting groups typify a 'voracious behavior". Thus, it is hypothesized that, the appropriating groups will 'overreact' to a positive productivity shock (or an increase in public revenues) such that the triggered increase in the speed of appropriation exceeds the gain in productivity (or the growth of revenues). The hypothesis is tested through a cointegrated vector autoregression (VAR) model; table (5) outlines the model. Similar method is used by Akitoby et al, (2008) and Szarowská, (2012). The VAR contains real spending per capita and real GDP per capita. The generalized impulse response, (GIR), functions, due to Pesaran and Shin, (1998), are used to interpret the results. The GIR functions are invariant to the re-ordering of the variables in the VAR, and hence allow meaningful interpretation of the on-impact response of each variable to a positive shock of the other. More than proportionate response of real spending to a temporary positive shock to real GDP per capita without positive feedback from spending shock on real GDP per capita would confirm the voracity effect. Significant results from the government size fragmentation and or the voracity effect models will be interpreted as evidence on the elite capture of the state and that patronage serves as major reproduction mechanism of their exclusionary power base.

3. The Rise of Modern Budgetary and Fiscal Institutions in Sudan

This section utilizes a range of observable implications in the lens of the dual approach to describe the critical juncture that set in motion a path-dependent process, which shapes the *political economy* of the *fiscal institutions of contemporary Sudan.* The Mahdist state is discussed in backdrop of the critical juncture. The approach is also used to explore the subsequent change in the path dependence of revenue structure in the next section.

The Turco–Egyptian colonial rule (1821 to 1885) was the first to introduce centralized extractive institutions and state-organized taxation in Sudan. The orthodox Sunni Islam adopted by Ottoman Empire was instituted as the state religion (a source of legitimacy) and increasingly used as a method of control and as a centralizing force with which to organize the Sudanese, (Hamid 1989). Taxes were almost confiscatory (a military operation) and often exceeded the market value of the taxable item; also the costs of collection were added to the tax bills, (Bjorkelo 1989). The extremely high taxes and harsh punishment for tax non-compliance provoked Sudanese resistance, which culminated in the rise of the Mahdist state in 1885, (Niblock, 1987).

Bait el mal, (literary the house of wealth) at Omdurman, the capital, emerged, from the start, as the most important fiscal institution of the new state. It also evolved as central agency performing quasi-public enterprises functions including money exchange bureaus and coinage. After the death of the Mahdi in 1885, his successor Khlifa Abdullahi was seriously challenged by the Mahdi's kin (*Ashraf*) led by Khalifa Sharif. The word *Ashraf* itself implies superiority, used in the context of the uprising to indicate the inferiority of the Khalifa and his tribesmen, the *Baggara* of western Sudan namely Darfur and Kordofan, (see e.g. Hamid 1989 and Abushouk 2006). Due to the growing suspicion about *Ashraf*, Khalifa opted for building new coalition based on his tribesmen, who were encouraged and sometime forced to migrate en masse to Omdurman and Gezira to rally support. Seven provincial *Bait el mals* were created and supervised by central *Biat el mal* at Omdurman, which reports on daily basis to the Khalifa and submits monthly budget as well. Also, to ensure efficiency the Khalifa appointed many foreigners in the administration of the funds (about 30% of the staff) including senior finance officials, (*Nakash, 1988)*.

The Khalifa's favouritism towards political supporters from Darfur and Kordofan exacerbated the contestation, which was organized around territorial identity involving the perceived superiority of the sedentary riverain tribes (*awlad al-bahr*, lit. sons of the river, and *awlad al-balad* lit. urban people) over the *awlad al-garib* (lit. the *Baggara* tribes).The Khalifa's policies of incorporating the western rural tribes into the ruling coalition have considerably disrupted the local systems of these agro-pastoralists and transhumant herders. The migration motivated by expected benefits from the incumbency as well as the forced settlement severely undermined the viability of the conventional productive pursuits of the western tribes resulting into repeated crop failures in 1890s, which contributed to the collapse of the Mahdist state in 1898. More important, these policies have left long-lasting political economy legacy of attaching ethnic and cultural supremacy dimensions to the representations of place identities in the politics of contestations in the contemporary Sudan (see e.g. Collins 2008 and Daly 2010).

It is argued here that, the *Condominium* policies adopted in the *inter-war*, particularly over 1922-29, have created distinctive patterns of tax policy and extractive industries that remained resistant to significant change *during the colonial period and well beyond independence*. The main actors, 'Sudan Political Service, (SPS)''s personnel, have profound impact on the territory and the implemented policies. Due to the dual authority over Sudan, the administration of Condominium policies did not lie in the Colonial Office. Instead, the Foreign Office selected its administrative personnel, using the system of the SPS advised by Cromer and Wingate; the British pro-consuls in Egypt, (*Collins 1972)*. By the early 1920s, the military officers were replaced by civil officers. The hyper-selectivity of the SPS's staff, coupled with the dual authority of the Condominium and the spectre of Mahdism, significantly influenced the attitudes of the British officers towards the administration of Sudan. They numbered about 393 and were largely drawn from families with imperial civil service or professional backgrounds. Indeed, three-quarters of them attended Oxford or Cambridge. After joining the service, they spent their entire careers in the country some serving for as much as 20 years in one district. Their unusually strong self-assurance stemming from long experience of administration in Sudan together with the similarity of outlook, sense of mission and their conservative views determined the course that the condominium would take, *(Daly 1986)*.

Two major policies adopted in response to a potential resurgence of Mahdism created a legacy that shaped the state fiscal institutions and political contestations through the Condominium and independence. One was the policy of low taxation. The British administrators believed that oppressive taxation during the Turco-Egyptian administration had given strong motivation to the Mahdist revolt. Instead of directly taxing subjects, the Government decided to generate revenues from the cultivation of cotton in Gezira. From the outset, land concessions were excluded and European settlement was not encouraged, (Moritz 1913). The heavy fiscal allocation to transport during 1899-1918 (about 78% of the budget[1]) opened the territory for trade and investment. Between 1919 and 1928 the bulk of fiscal allocation targeted the establishment of the Gezira project. This policy is not in line with the British precedents, because in Egypt and throughout colonial Africa independent farmers cultivated cash crops. The idea of the Gezira project was not without its critics. It was feared that the immense and costly project will discourage private initiatives and unnecessarily amass large pool of labor in one area, (Tingor 1987). More importantly, Egypt opposed the project on the counts (a) that it would compete with it for Nile water and (b) that it would compete with its own lucrative cotton crop. Nevertheless, after successful cotton experimentation inTokar and Gash Delta, the state decided to set up the project, the largest undertaking in the world during the interwar period. Under the Gezira system; the state, the tenants and Gezira Syndicate (marketing board) jointly shared the profits. This partnership was adapted from the ruling traditional (*Musharak*) system in Sudanese agriculture. The Government share from this enterprise surged from 3% of the total profit during I923-5 up to 15 % in I926-8; and by 1930s, cotton contributed about 60% of total Sudanese export, **(**Gaitskell 1959).

The second policy was motivated by a very sympathetic attitude toward Islam, which led to the exclusion of missionaries from the North. However, they were granted a modest presence in the non-Muslim South where they became the sole means for providing basic education for Southerners, (Daly 1986). The senior officers of the SPS perceived Northern Sudan as monolithic Arabized Muslims. Hence, the civilians who administered the North were trained in Arabic, instructed to respect Muslim peoples; and themselves were devotees to the Anglican Church, while South Sudan and part of south Kordofan were administered by a different arrangement under the *Closed District* Ordinances (CDO), effective in 1914-1946, (*Collins 1972)*. Notwithstanding the perceived homogeneity of Northern Sudan, it was multilingual, just within a 300 km radius of Khartoum, the capital, there live about 600 ethnic groups speaking 400 languages, (Fadlalla 2005). Hence, a standard official language between the state and its

[1]Funding during this period was effected by subvention paid by Egypt to cover Sudan's budget deficits, which was an exceptional case of cross-colonies fiscal subsidization designed to avoid the imposition of taxes in Sudan.

subjects needs to be forged. It is arguable that the insistence on Arabic as state official language owed its origin to the SPS's policy towards the choice of the official language.

Also, the fact that Sudan's political *Islam is not monolithic tempted the colonial officials to attune the accompanying* differences *in order* to influence the evolution and orientations of the Sudanese drive towards independence, (Hamid 1989); a process that Salomon (2004) described as local religion reform. The Mahdist followers, *Ansar*, were reengaged as neo-Mahdists, (Ibrahim 1980) and over time their interest was linked with Britain to pre-empt the Egyptian influences. The rival religious sect, the *Khatmiyya*, was preserved to sustain the religious-politico equilibrium. The colonial officials even engaged these contesting sectarian establishments in private cotton scheme and commercial projects, (Niblock 1987).Eventually, the Mahdi and Mirghani *dairas* (administrations) evolved as zone of influence through the distribution of financial and other forms of patronage to vast groups of supporters, (Tignor 1987).The major parties that dominated the post-independence political market followed the same sectarian lines with the Umma Party representing the *Ansar*, and the *Ashiqqa* Party (later the National Unionist Party NUD) representing the Khatmiyya, (Hamid 1989).

A third policy legacy related to the institutionalization of the native administration on tribal-territorial basis. It is known that the during the Mahdist state the tribal leadership was abolished and the tribal system was destabilized by the Khalifa's migration policy including forced sedentarization. The rain lands in the central and eastern regions of Sudan were seriously affected by these developments. From the outset of the colonial rule, it became obvious that state intervention was required to settle disputes between larger groupings concerning rights over water sources and grazing lands, (El Shazli et al 2002). Hence, the British colonial administrators created a new tribal society taking the tribal dar as the basic administrative unit, (*Robinson, 1976).* Subsequently, the state subjects' relations were regulated through rights in land based on the well-established patron-client and ethnic relationships. The Titles to Land Ordinance was issued in the first year of the Condominium. It legitimatized the private ownership of the continuously cultivated lands in the riverside areas. Outside the riverside lands as well as the 'unsettled areas were classified as government-owned and further divided into two categories: (a) government land subject to tribal usufruct rights, mainly in the central and eastern regions, and (b) government land subject to no right[2]. This categorization has remained almost intact until today.

The entire ethnic groups were organized under well-defined tribal agglomerations with carefully demarcated tribal homelands (dars) and were upgraded to local councils in 1951. The agro-pastoral movements necessitated by ecological constraints were recognized and regulated by *strict enforcement of 'grazing lines', especially in Northern Sudan, to separate the respective domains of cultivation and grazing*. Also, range management was linked to water policy and were both administered at the local level. Watering points are distributed in such a way so as to influence the timing and direction of the nomads' movement, (*Eltayeb*, 1985). Each dar was presided over by *nazir* or chief, and is divided into several *khuts*, (lit. lines denoting sub-administrative unit of homogeneous ethnic groups) and is headed by *omdas*, below the *omda* were the *sheikhs* of the villages and nomadic camps. The *nazirs* were made client to the state and were usually backed financially and militarily to settle disputes and keep law and order, (*Robinson, 1976)*. The system of *the native administrative was completed in about two decades since inception in early 1920s and participation in it was not completely voluntary and* free from the state coercion. The Gezira Land Ordinance issued in 1921 (amended in 1923 and 1927) gave the government the authority to compulsorily rent land from its owners, who were also given preference in tenancy allotments. Private large scale sorghum

[2] Tribal usufruct rights were not legally registered and according to the 1930 Land Acquisition Ordinance were subject to withdrawal by the government whenever need arise for alternative public use.

production was licensed in demarcated land in the central and eastern clay plains. The control and administration of lands outside these demarcated uses were completely devolved to the local territorial levels.

The introduction of the Companies Ordinance in 1925 and the Partnership Ordinance in 1926, which remained until 2015, have created the legal framework including the incorporation of the sectarian establishments in the cotton and commercial enterprises. Also these business regulations significantly boosted private entrepreneurship particularly in the demarcated large-scale mechanized farming (el-Gadarif and later on Habila and el-Renk), which was critical for production of staple food, (sorghum) necessary to keep food price and hence the cost of labour low for the cotton projects. Plantation slavery was not practiced in Sudan; instead the *institution of wage labour was promoted*.

The decisions of the state administrators to invest in the cotton infrastructures (the dam and associated capital-intensive works including Gezira's railways), while encouraging inter-territorial food supplier-linkages by encouraging private entrepreneurship in sorghum production have led to cumulative and self-reinforcing development and unique development path of capital accumulation in Sudan. However, cotton production ultimately benefited the British textile industry; the state administrators viewed the realization and perpetuation of the Gezira project as goals in their own right, (Gaitskell 1959).

The overarching policy goal of the Sudan's Financial Secretary was to ensure the overall profitability of the scheme. The volatility of the international cotton market was a real concern. But, every time the actual cost of the project appeared out of proportion to what it might be expected to yield, the proposed size of the irrigated area was increased to reduce the relative cost of the project and make the overall budgets appear more favorable (Daly 1986; Gaitskell 1959). As a result of this strategy; land under cotton production continued to increase in Gezira, and in the Tokar and Gash Delta as well as in the Nuba Mountains. Each scheme was managed individually with its own independent board of supervisors. The principal departments such as the Departments of Agriculture, Public Works, Finance, Irrigation and the Board of Trade and Economics typically were represented in each scheme's board; also, the representatives of these institutions oversight the schemes' boards.

The empowerment of Sudan's Governor-General, after Egypt independence in 1922, increased the autonomy of the state administrators, and the state finance was institutionalized in the Department of Finance under the Financial Secretary who was made accountable to the Governor-General without reference to Cairo or London, (Daly 1983). But, the strengthening of the Financial Secretary coincided with the significant drop in cotton price due to New York Stock market crash and ensuing world depression in the 1930s. As was the case in the rest of the Empire, the state administrators resorted to planning in response to the crisis. The governors of various provinces and the heads of departments were encouraged to design development projects reflecting the local needs. However, this attempt furnished a list of projects rather than a plan with a strategy. The Finance Department was entrusted with the preparation, implementation and auditing of the central budget, which evolved as a formal method of fiscal planning. And it provided a comprehensive view of Sudan economy, despite the continued uncertainty created by the dual Anglo-Egyptian authority over the country and by the unclear linkages of the various regions of the country to one another, (Young 2013).

After the Second World War 1939-45, and as the case in other colonies, a process of long-term development planning was started. A General Development Account was created within the Finance Department and is entrusted with preparation of Sudan's first Five Year Post-war Development Plan (1946-51), which encompassed development projects focusing on both local and country levels. The most important local projects included the Zande Scheme, the most ambitious development project ever in southern Sudan; Jebel Marrah Scheme in Darfur; Nuba

Mountain Cotton Scheme and Jonglei Canal Project. Development projects at country level focused on the expansion of irrigated plantations and railways. In all colonies, the idea of development planning was introduced to reinvigorate colonialism in the post-war period by promoting legitimacy and central governability of people, (Cooper 1997).However, as a general rule, the Finance Department prioritized the projects that maximize the revenues of the central budget over those contributing to local development and self-sufficiency. Accordingly, similar system of Gezira state tenancies for cotton and Al Gedarif large scale food production types of models were introduced in the Nuba Mountain in order to boost export competitiveness in short-staple cotton market. The Zande scheme in South Sudan and Jebel Marrah scheme in Darfur for growing tea, tobacco, cotton and other tropical crops as well as manufacturing textiles were underfunded on the count that they were self-sufficiency oriented, far flung and risky undertakings with no historical baseline against which to compare their performance, (Young 2010).

Although the finance officials were concerned about Sudan's economic vulnerability due to the significant volatility of the cotton price; the argument maintained throughout the period 1922-1953 was that Sudan's cotton was cheap due to low cost of production including labor and was of highest quality and therefore would always finds ready buyers at a higher price, Gaitskell (1959).The SPS was hesitant about encouraging private initiatives. Plans for diversification away from cotton though small-scale food processing and production of other crops were made; but remained exploratory, (Young 2013).Outside the state-run and the SPS managed tenancy base system; the private sector was involved in large scale cotton production in the areas South of Sennar and on the West Bank of the White Nile below Kosti up toward Khartoum, (Niblock 1987). Sudan's export-oriented capital accumulation; based on state and private cotton production; was well linked with the large scale production of staple food, which was critical for sustaining external competitiveness. The concentration of investments in the cotton triangle formed by Khartoum—Kosti—Sennar due to Gezira scheme and in the clay plains of the eastern and central Sudan had led to sharp polarization of resources and people. In response seasonal labor migration, particularly for harvesting cotton and sorghum in the large-scale farms, was encouraged. Workers were usually drawn from Kordofan and Darfur; but most of them were able to keep their subsistence farms as their permanent mode of living. While the evolving rural-rural pattern of labor migration had lessened the pressures of urbanization given the very limited industrial base, it offered rural households only a very limited window for diversification through permanent wage employment due to the high in-kind component of wage payment. In most of the cases the migrants had to accept in-kind payment as they have not enough cash to support themselves until the time of their first payment; and labor contracts were often involved in the power relations of the contractors, the employers and the villages' sheiks, (Abdelkarim1986).

Redressing the challenges of the evolving spatial segmentation and inequalities was accorded high importance in the Second Development Plan 1951-56. Also, as independence and political competition loomed high, the general sentiment at the time of the designing the plan was to win allies amongst the rural constituencies that would eventually contest the vote, (Justin and al-Batthani 2010). Hence, unlike the previous plan, the second plan emphasized a more spatially inclusive form of development. The plan advocated comprehensive surveys in order to identify new projects for aligning the state resources to support the neglected peripheral localities and to provide a baseline against which to measure the progress of development. The major achievements of the plan, besides continuing investment in the capital intensive railways, was the expansion of low cost infrastructures, such as boreholes drilling; machine-excavated reservoirs and communication service as well as feeder roads networking these utilities, which opened up the rural area for trade and development, (Young 2013). Additionally, the Local Government Ordinance of 1951 introduced the local councils with the view of encouraging the increasing ties between rural and urban, traditional and modem Sudan. The administrative boundaries of the councils were largely fixed on the basis of the tribal dars, granted, judicial power, financial autonomy and taxing authority; and later on served as electoral districts, Vaughan (2010). Notwithstanding the focus of finance officials on profitability, the second plan initiated for investments in the long-term development of a better tax base.

Although the state institutions built by the SPS helped pave the way for a relatively harmonious independence; the British officials were heavily criticized for pursuing economic policy that sanctioned the state's dominance in the country's economic life; strangled a free economy and thwarted the growth of a professional and entrepreneurial middle class, (Daly 1986). No doubt, in principle, the colonial rule was meant to stifle rather than serve the 'national interest' except by fluke. But the question is why such policy failures during the colonial era have not triggered a process of change after independence? Why has the extant model of cotton-driven capital accumulation not been discredited *in favor* of a diversified agro-industrial development? Was the option of development through diversification of activities available?

4. Development Planning and The Lock-In in Irrigated Cotton

In the lens of the dual approach, the policies adopted in the period 1922-29 had left a profound legacy. The SPS succeeded in engaging various local elites through the administrative machinery and entrepreneurship in cotton and other activities and sharing with them a series of reciprocal interests (Niblock 1987). Contrary to the influential argument that the British colonial liberal heritage has promoted market economy after independence, (Weiner 1987and North 1981), the SPS opted for a state-socialist structure. It is argued that this outcome was due to the Fabian-socialist orientation of the SPS (Daly 1986 and Young 2013); however, the SPS resorted to the longstanding institution of partnership, which embedded elements of social socialism, as a viable mechanism for incorporating the cotton farmers. Both the patron-client systems and the partnership were *antecedent institutions* to which the SPS reacted.

4.1 Post- independence development planning (1955/56-1961/62)

Independence was an important juncture, but failed to deliver a transformative change based on inclusive socio-political power relations. The transitory self-rule (*1953-56)* was marked by intensification of sectarian rivalry between the two major parties, the Umma and the NUP. Moreover, the southerner troops mutinied in August 1955 driven by latent fears and suspicions provoked by *rising regional inequalities, (Hamid 1984).*The territorial and self-sufficiency oriented projects identified in the Second Development Plan 1951-56 were not pursued and even the recommended baseline surveys connected with their implementation were not executed.

At independence in 1956; the political contestation continued and involved the ideas of a federal Sudan with autonomous regions (to contain the separatist tendencies among the southern elites); an independent Sudan with closer economic ties to Britain (the Umma view); and an independent Sudan as part of Egypt (NUP'sview), (De Waal 2010). However, all contesting parties agreed on the state custodianship of the economic resources. The centralization of the fiscal institutions and budgeting were ensured by Sudan Transitional Constitution in 1956; which mandated the *Ministry of Finance*[3] *to* prepare the budget in consultation with line-ministries, which are five at the time. This provision, to date, survived various constitutional amendments. As from 1956 *the* dual track budgeting became the major fiscal *instrument at the disposal of finance officials. The first track related to the manipulation of the current annual government* expenditure and revenue*; while the Development Branch of the Department of Finance concerned with long*-term planning intended to incorporate new projects aiming to achieve financial and socio-economic goals. The inherited fiscal practices,

[3]*Department of Finance was upgraded to the* Ministry of Finance in 1954.

including in the transitional period, were based on decision rules using incremental budgeting and cost benefit type of methods. Each year, the budgeting process started from last year's cotton revenues (unit price times output) to forecast the total budget. In this process, the assumptions about the domestic cotton price paid to the tenants and the international cotton price were crucial for determining the budget and the position of the balance of payments as well as the benefits of including new development projects. During 1953/54-1955/56 cotton provided about 50% of the government revenues, the rest contributed by the government monopolies of railway transportation, sugar trade and import duties. Also cotton was major foreign exchange earner generating about 72% of the foreign reserves. Despite the importance of cotton, the downside effects of depending on it were seriously debated, (Young 2010). Yet, the expansion of the irrigated cotton as engine of economic growth triumphed. In 1956, the Managil scheme, (about one million acres extension to Gezira) was identified as top developmental priority by the New Schemes Program, NSP, (1956-61), prepared by the Ministry of Finance[4].

Nonetheless, the debate on irrigated cotton-driven growth continued in subsequent literature. For example, the books by Gaitskell (1959) and Barnett (1977) give opposing views on the Gezira Scheme. To Gaitskell (1959), the Gezira scheme was not just business; it was a monument of great material and symbolic proportions. To him it was a 'story of development', while for Barnett (1977) it was an 'illusion of development'.

If the cotton- driven growth is sub-optimal, why there insistence on the Al Managil extension, particularly since the type of diversification originated by the second development plan would address regional inequality and expand the tax base? The answer to the question is based on the claim that the key actors came to see their interest consistent with the existing development pathway and well served by the cotton- led growth. The Gezira cotton triangle itself was a result of a process featuring path dependence in the presence of strong increasing returns accruing from large fixed and sunk costs of the cotton project including the positive externalities emanating from associated socio-spatial networks. Increasing the state revenue would also raise the incomes of both the political and the cotton elites and fund the patronage system involved in the election.

The Ministry of Finance projected that the Managil could be financed from its own sources within ten years; but the decline of cotton price in 1957 compelled the Ministry to revise its calculation and advocate the search for donors to fund the project, an idea that was opposed by the politicians. However, the continuing recess in the global cotton market has led to government change in 1958, which was largely attributed to the sharp drop in the state revenues that deprived the political system of the money used to fuel its system of patronage, (De Waal 2010 and Young 2013).

4.2 The Ten Year Development Plan 1961/62–1970/71

The major justification for the military government of 1958 that lasted until 1964 was that the democratic government lacked the discipline necessary to develop the Managil Scheme, and to redress the growing demands for investment in the periphery, (Niblock 1987). The military staffed the Ministry of Finance with technocrats to boost its legitimacy claiming that it was putting fiscally responsible bureaucrats in power in the place of ineffective civilian politicians (Young 2014).

The Development Branch of the Ministry of Finance was upgraded to a Ministry of Planning in 1960, indicating the need to separate development planning from recurrent budgeting. The new Ministry crafted the Ten Year Plan for Economic and Social Development, 1961/62–

[4] There was extensive discussion on whether the ministry should plan or program; for example the under Secretary of the Ministry of Finance argued that the NSP as stands needs a strategic plan; but the idea was subsided.

1970/71, featuring Managil Scheme as main state's project. However, the plan was a major improvement over the previous plans. The planners benefited from the experience and learning that accumulated since the introduction of planning in Sudan in 1945 including from the new development theories due to e.g. Rosenstein-Rodan (1943) and Lewis (1954). They also benefited from the publication of the results of the population censes and national income survey conducted in 1956. The introduction of the macroeconomic tools that evolved with the global adoption of the national income accounting and measurements practice during the 1950s, better equipped the new staff to articulate a coherent framework to demonstrate the impact of the Managil Scheme at a national level (Wynn 1971, *Abdel Wahab 1976 and Young 2014).* Like the case of other LICs, the plan adopted the logic of the developmentalist state, by pursuing economic growth rather than equity and redistribution. Accordingly, it was believed that by spatially concentrating investments in the Gezira triangle (the modern sector) enough surpluses would be generated for investments in the rural territories, which were perceived to be a residual category that would diminish overtime, (Mirghani 1983). In order to make the spatial concentration (inequality) politically feasible, the government did not call for taxation to play a major role in raising state revenue (Poduval 1963). This approach to development policy continued to influence subsequent development plans. During the plan the GDP expanded by 30%, but at the cost of very high regional inequality, which further exacerbated the continuing open military conflict in south Sudan, (Niplock 1987). It is clear that improved economic position as such is not enough for pursuing the consensus reached at independence: federal Sudan with strong foreign ties, especially with Egypt and Britain. The slow acting elites during the democratic period, the rise of the military in 1958 and the escalation of civil war thwarted the hopes of forming a federal Sudan. The military regime was ousted by popular revolution in 1964, inspired by the slogans of the Sudanese left, demanding more inclusive government and economic reform through nationalization, particularly the banks. The elected government was dominated by the coalition of Umma and UND parties. Reform through nationalization was not pursued; instead the Ten Year Plan was instituted as a framework for disciplining public finance and the economy. At the time, the regional, sectarian, and ideological divisions were escalating while the continuing civil war in the south was driving the country to the verge of national disintegration, (Hamid 1984).

4.3 The Five Year Development Plan (1970/71-1974/75)

The May regime (1969-85), like the previous military rule, resorted to technocrats and sought to forge a new coalition based on progressive forces; farmers, workers, students and professionals in the face of the traditional sectarian parties (Umma and NUP).The ideological push of the reformists of 1964 revolution reached its apex in the early years of the May regime, (Tingor 1987).A Five Year Plan of Economic and Social Development (1970/71-1974/75) based on socialist style of planning, with technical support from the USSR, was introduced. However, after an aborted coup in 1971 staged by the Sudanese left in a bid to seize power, the May regime turned to the south Sudan elite to invigorate its power base. In 1972 Addis Ababa Agreement (AAA) was concluded with the southern leaders ending the civil war. The (AAA) provided for an independent budget for the south with revenues from regional taxes and central transfers. Additional resources were needed to fund the stalled development program and materialize a peace dividend; hence, the May regime resorted to borrowing from the international community. However, the (AAA) ushered a new phase of politics in south Sudan with patronage system guaranteed by the President, (Hammed 1984 and Leach 2011).

The Five Year Plan was important for mediating the elite conflicts and bargains; it was extended for two years and the goal of achieving national unity was integrated in the planning process. The amended plan emphasized agro-industrialization-led growth through domestic and foreign partnership. However, almost all authorized funding during the plan was infused into the inherited economic structure defined by state-led irrigated agriculture and the private large scale mechanized farming. Irrigated cotton was expanded in *El Rahad* and *El Suki* schemes away from the base of the traditional cotton elite. A miniature Gezira was replicated in the sugar production at *Kenana* and *Asalaya* Irrigation schemes. Also, oil was discovered by Chevron in 1974, but the prohibitive cost of the export infrastructure made its commercial utilization unprofitable at ruling price.

Outside irrigated agriculture, many politically motivated “white elephants" were created, targeting specific areas. While some of these projects were never completed, (e.g., Gado Weaving and Textile Factory, Port Sudan Textile Factory, *Hag Abdallah* Spinning Factory and *Babanosa* Pasteurized Milk Factory), the number of parastatals increased quickly and also evolved as an instrument of patronage through which jobs and other privileges were distributed to political supporters.

Although a Sixth Plan (1977/78-1982/83) featuring a miniature Gezira in wheat production was prepared, it was abandoned in its first year due to the significant drop in foreign financing, *(El-Shibly and Thirwall 1981)*. As a result an IMF- supported structural adjustment under Three Year Rolling Programs (1978/79-1980/81 and 1981/82-1982/83) was implemented. In 1983, the May regime abandoned the development planning and unity goals as source of legitimacy and resorted to political Islam in search for new base for coalition building and legitimacy. Since, the specter of Islamization had been, mistakenly or not, a perennial worry in the south, (Hamid, 1984); the second south Sudan civil war erupted. The economic crisis was not a direct cause of the conflict, though concerns about reduced transfers to the south Sudan were made, (Hamid, 1984).

The Ten and Five Year plans sanctioned the mono-export structure based on cotton. The rural-rural migration, form labor surplus traditional agriculture to labor deficient cotton sector became a distinctive feature of this model, (ILO 1976). The intra-rural movement of labor together with the rural-urban food market linkages and networks preformed a vital role in keeping wages and food price low, which evolved as source of competitiveness of the export sector. Also, due to the balanced and internally articulated model of export-oriented capital accumulation, Sudan remained immune to the famine that struck the Sahelian countries in 1963 as well as in 1974, (*O’Brien 1986*). However, the drought and famine that ensued in the consecutive growing seasons 1983/84 through 1985/86 forced the model away from its long run equilibrium.

5. The Onset of Decreasing Returns and the Era of Economic Salvation

The second juncture is related to the drought shock over 1983/84-1984/5 and also coincided with two major changes in the institutions governing natural resource management, which together have created a situation of institutional flux. Firstly, the long-standing institution of native administration mandated with local level natural resources’ management was effectively weakened by the Civil Transaction Act in1983[5]. Secondly, the Rural Water Corporation, which synchronizes the management of water; range and pasture, was dismantled in early1980s. At present, water management was affiliated with the Federal Ministry of Irrigation and Water Resources and Range and Pasture with the Federal Ministry of Agriculture and Forest.

The greater centralization of natural resources management and the shift of decision-making processes from the local to central level together with the continued adjustment of the regional boundaries (see table 3) have led to significant administrative chaos in the rural economy. The weakening, over time, of the local institutions that mediate people’s access to land, including their adaptive processes and production strategies provides explanation for why Sudan’s

[5]The native administration was gradually rolled back, first by replacing the Native Courts Ordinance, its judicial power, by a uniform Statuary law in 1971; second by constitutionalizing state socialism in 1973 and later on by passing the Civil Transaction Act in 1983, which re-stated state-ownership of all unregistered land.

effectively and efficiently responded to the Sahelian droughts in the 1960s and 1970s but not in the 1980s. In this regard, the theoretical and empirical finding in Nugent and Sanchez (1999) show that, the spatial distributions of sedentary small-scale farmers, agro-pastoralists and nomadic pastoralists together with the choices of the tribal and land management institutions spontaneously evolved as long-term responses to the local variability of rainfall including other ecological and socio-economic factors. In addition, the authors confirmed that, when the risk of drought and the local variability of rainfall are sufficiently high, it is optimal for a risk-averse household maximizing expected utility to diversify through greater plot scattering and/or high frequency of herds' movement, which in turn, demands more decentralized management of the land tenure. Hence, the centrally imposed *changes of* regional cum tribal boundaries *coupled with the* high mobility of farmers and herders, in response to mid 1980s droughts, increased the incidences of confrontational trespassing. The contestations that ensued since 1983 between herders and farmers, especially in Darfur and Kordofan, escalated overtime and were manifested in varied complex forms: inter-group conflict, banditry, rebellion and open civil wars.

Notwithstanding good rainfall in 1986-88, the agro-pastoral economy failed to produce enough food for itself; leading to the start of an era of humanitarian assistance, Operation Lifeline Sudan. By early1990s the civil war progressively came to incorporate concepts such as 'ethnic cleansing' and 'colonization', (El Shazli *et al 2002,* Babiker et al 2005*and Frey 2009).*Many agro-pastoralists who lost their herds, the wealth base, became migrants, particularly in Greater Khartoum and other big cities, or turned to the refugees' camps and others joined the rebellions. *Over 1984-2013 the ratio of urban* population *to total population increased by 20.3 percentage points up from 13% average in 1956-1983.* The bureaucratization of the local administration and the standardization of land usufruct rights, have not only raised the costs of public administration, but also fueled the local conflicts over land and natural resources. *This process significantly altered* the rural-rural patterns of labor migration and weakened the rural-urban food market linkages, which in turn, set in the process of decreasing returns to the spatial networks underpinning the irrigated cotton sector, and hence derailed the state's revenue from its historic path[6].

A series of salvation policies were proposed and implemented aiming to recover the economic deterioration following the decline of cotton and the related industries. A Four Year Salvation, Recovery and Development Program, SRDP, 1988/89-91/92, was proposed by the government elected in 1986. The SRDP was preceded by a One Year Action Program, with technical help of the IMF. The Action Program emphasized the usual structural adjustment measures; including price and foreign exchange decontrol, credit tightening, deficit reduction and divestiture of non-performing parastatals. The political elite were hesitant to apply the program because it involved laying-off civil servants and the removal of food and energy subsidies which were politically difficult in view of the unstable coalition dominated by the Umma and UND parties, (Bechtold 1991). A new National Salvation Revolutionary Government was formed by the military (1989 to date) after a coup that overthrew the elected government. Three Three-Year rolling National Economic Salvation Programs (NESP) were put in place in 1990-99.These programs advocated economic liberalization and privatization emphasized in the Action Program. However, the reform of irrigated cotton was not prioritized. Indeed, the revival of cotton requires the resolution of the civil conflicts and deep-seated structural reform of the rural economy to reestablish the eroded inter-peripheral labor market as well as food market linkages.

[6] The central ruling elite's slowly recognized the negative impacts of abrogating the native administration as evident by the belated efforts to reinstate it in the 1990s in a new form (see table 3).

The decline of cotton had significantly weakened the economic base of the private cotton elite the historical source of funding the Umma and UND parties. The Salvation Revolution coalesced with the National Islamic Front (NIF), an urban based political party formed in 1976, on the idea of the 'Civilization Project' viewed as a return to true Islam, (Al-Affendi 1991). The proposal also include building broader Islamic association in the context of a Popular Arab and Islamic Congress (PAIC) party, aiming among other things, to revive *Jihad* and control the local armed conflicts, Burr and Collins (20030. Moreover, the ruling elite opted for *el-Tamkeen* policy (lit. empowerment), that is a new channel for patronage distribution seeking to consolidate control over the state. The policy was designed to purge the civil service, security, armed forces and other key institutions of political opponents, (Mann 2014). It was estimated that between 1989 and 1999 about 73.6 thousand were replaced, which was more than 2.2 times the number replaced by successive governments between 1904 and 1989, (Elzobier 2014, Chap. 5). Also the privatization component of the three successive NESPs between 1990 and 1999, which was claimed by the political elite to increase the efficiency benefits and the public finance imperatives was exploited to expand the economic and political power of the cronies; a process that Suliman (2007) called privatization by invitation. Despite the application of the NESPs, the socioeconomic conditions continued to deteriorate. The intensification of the war against the rebels has further destabilized the rural economy accelerated the collapse of Gezera project resulting in the most turbulent period in modern history of the country.

Fortunately, the high demand for energy driven by the rise of the Asian Drivers (China and India) in the 1990s significantly raised the value of Sudan's oil discovered by Chevron in 1974, (Gaafar 1995 and Large and Patey 2011). However, the high costs of protecting the oil pipelines connecting the oil fields, mostly in the south, to the export port against the rebels 'attacks made the integration of the fighting groups into the ruling coalition inevitable. In turn, this adjustment had led to the factionalization of the PAIC into the National Congress Party, the champion of peaceful integration of the rebels into the governing coalition and oil-sharing arrangement and the People Congress party that joined the opposition (Azam 2015). Oil has generated an alternative source of resource rent as well as new challenges. Oil revenues averaged 15.2% of GDP during 2000-13, compared to 16.5% contributed by cotton in 1956/7-1983/4; bet oil was accompanied by a classical case of Dutch disease. The misalignment of the real exchange rate from its equilibrium increased to 39.8% during the oil era over 1999-2009 up from 4.1% average for 1970-1999[7]. As shown in Konandreas (2009) about 41% of the factories have closed in 2001-07, which clearly reflects the negative effects of the exchange rate appreciation on the production structure. More importantly, during the oil boom the ruling *elite resorted to* visible and quick-fix solutions to boost legitimacy; examples include doubling the roads network and the construction of Marawi hydroelectric dam.

After the loss of 75% of its oil, diversification by reviving agriculture has become once again a major policy goal. Although an Agricultural Revival Program, with an estimated cost of USD 5 billion is announced in 2007-2011, the recovery of the Gezira scheme, which costed about USD 4 billion, continues to present great challenges. It is clear that, rehabilitation of the Gezira scheme requires not only more investments and deep seated restructuring of the rural economy; but also serious efforts to resolve the persisting civil war in Kordofan and Darfur and Blue Nile states, where the majority of the rural people live. Subsistence on the infrastructure of the cotton enclave without resuscitating the cotton networks is the option of last resort for reproducing the status quo. It is no surprise that on the eve of the south's secession, some advocates of the ruling party proposed engineering a big bush by concentrating investments (to be attracted from sisterly oil-rich Arab states) within the infrastructural space networked by the cities of the irrigated cotton triangle, (see Downie and Kennedy, 2011 and De *Waal 2014a*). However, the

[7] Year-on-year percentage change calculated from data provided by the ERF's project on the Research Initiative on Arab Development.

proposal reflects the virtual disregard of rural development as in the previous development plans and recovery programs.

To replace the lost oil, the ruling elites encouraged gold prospecting. At present an estimated one million prospectors have joined the gold rush. G*old* emerged from the scratch as *Sudan's* most important *export* earner in 2012 accounting for 40% of exports and expected to contribute one third of total export in the medium term. Gold mines are scattered across the country, about 80% of gold production was contributed by small scale miners and prospectors. Although, mines in Darfur, Blue Nile and South Kordofan states produce limited quantities of gold, they have also been sites of conflict between the government and the rebellions, (Kumar 2015). The government adopted a policy of large scale gold purchases through the Central Bank almost all financed by money printing. As a result the CPI inflation has surged from 13.2% in 2010 up to 36.9% in 2013-14, (Elbadawi and Suliman 2015). In addition, the shift towards labour-intensive gold production increases the risk of the Dutch disease by inducing labor movement from agriculture towards the booming gold sector, particularly that crop agriculture is already declining. As seen in figure (2) the yield per feddan of sorghum and millet had dropped by more than *half* between 1956/57 and 2006/07, while the cultivated area increased almost six folds. Moreover, the area and yield of sesame (a cash crop) exhibit similar pattern. In the case of irrigated cotton, the yield is rather stable (about 500 kg per feddan), but the cultivated area dropped by 60% between 1960/61 and 2006/07 reflecting the process of decreasing returns in socio-spatial networks of cotton production. The various policy programs implemented to mitigate the crisis triggered by the drought in mid 1980s failed to deliver long-lasting structural change to stimulate the historic export crop of the country.

The main narrative of this chapter suggests that, despite the appeal of the state builders to the universalism of Islam, especially during the Turco–Egyptian rule (1821 to 1885), the Mahdist (1885 to 1898) and after independence in 1956, the very universal principles authorized by the concept were *simply* bypassed. Instead, coercion and personalized institutions for sharing reciprocal interests were largely used in the process of the state-building. During this process the elites developed various mechanisms for rent recycling such as allocation of access to natural resources together with the distribution of public projects and jobs and the transfer of privileges through discretionary economic policies or denial of these transfers. Overtime, the greater centralization of the reciprocal patronage networks contributes to the undermining of the state capacity to effectively respond to the successive droughts shocks in mid 1980s leading to the eventual collapse of cotton, the main source of revenue and foreign exchange earnings. The assessment of the extent to which the political patronage including rent-seeking behaviors dominate the fiscal institutions leaving little room, if any, for effective fiscal policy presents grave challenges. However, it is generally claimed that responsible fiscal policy is, at least, based on credible budget, mitigates the harmful effects of business cycle and is solvent in the long-run. The next section reviews this claim for Sudan using historical data on the budget.

6. The Politics of the Budget

It is known that the budget process is highly political and can be capture by vested interests with strong incentives and means to appropriate public money for private interests. Accordingly experience around the world suggests that sound budgetary and fiscal rules should be in place to gear public finance to deliver at least its classic objectives (economic stability, operational efficiency and efficient resource distribution), (Rodrik and Subramanian 2003). The evidences for Sudan in terms of the major principles of responsible fiscal management (i.e. credible budgeting; effective countercyclical fiscal policy and long run fiscal solvency) show the following:

First, systematic evaluations of the budgetary process are not available for Sudan. The first full assessment of the public financial management (PFM) system for the country covering the entire PFM cycle from budget planning, budget formulation, budget execution, accounting, reporting, audit, and oversight was conducted by the World bank for the period 2005-2007. The overall rating of the country in terms of 28 performance indicators (PI-28) and 3 donors indicators is very poor averaging about C, (D is the lowest score). It is known that the credibility of the budget in terms systematic implementations of the budgets as approved is a major attribute of responsible fiscal policy. As seen in figure (3) the credibility of the budget in terms of the PFM indicators PI-1 to PI-3 over the last three decades is very low. In terms of PI-1, there were clear systematic differences between budgeted amounts and actual outturns. Also there were high within year variances in the composition of expenditures-outruns. For example, between 1970/71 and 2013 actual expenditures exceeded budgeted amounts on salaries, goods and services including centralized items by an average of 3.7%, but fell short of budgeted amounts in development spending by an average of 26.2%. On the revenue side, there have been repeated episodes of revenue shortfalls of more than 40% on an annual basis. Wide deviations between actual and budgeted revenue usually translate into expenditure rationing and increase budget volatility. In bad times much of the spending cuts occurred in the share of social services (education and health) that is so crucial for long term development and well-being. For example, the share of social services in total public spending fell from a peak of 22.6% in 1965/66 to 1.5% in 2013, (see figure 4). These biases not only confirm low credibility of the budget, but are also a very anti-developmental bias.

Since political independence in 1956 Sudan has instituted the centralization of the budget preparation, approval and implementation including auditing. Subsequent constitutional amendments enshrined these rules and in 2005 specialized fiscal rules are introduced aiming to strengthen the management of the oil sector. However, the budget continued to be operated with only partial regard to these guidelines. Due to the weak performance in terms of these key procedural steps Sudan was ranked at the bottom end of the budget institutions index constructed for 46 African countries by Gollwitzer, (2010).The index assessed the quality of the budget in terms of five categories: centralization, rules and controls, sustainability and credibility, comprehensiveness, and transparency. And each category consists of several individual performance indicators (34 in total). Sudan's overall score is 0.058 compared to 0.457 score of the best performer, (Gollwitzer, 2010, table A-II-2 p.55). Indeed the structural shift of public revenue source from the broad-based cotton production and agricultural tax to oil, which is a point resource, has contributed to this overall poor rank.

Second, when the correlation-based testing for countercyclicality[8] proposed inter alia by Agenor et al, (2000) and Talvi and Vegh, (2005) is applied to ascertain the contribution of the fiscal variables in dampening the business cycle, the result suggests that these variables tend to move procyclically, (see also figure 5). The contemporaneous correlations between the log difference[9] of spending, tax revenues and the deficit in relation to GDP are, respectively, 0.498 and 0.498 and 0.062, all are statistically significant except the last coefficient. Also, the correlations at lag 1 are all positive and significant for spending and tax revenues. Commodity taxation, which accounts for 68% during 1957/58 -2010, appears as a major driver of procyclicality of revenues. Also the taxing capacity, measured by tax-to-GDP ratio, is volatile and declines over time, (see figure 6). It is known that, assuming away the direction of causation, effective countercyclical fiscal policy requires procyclical revenues and strong countercyclical expenditure and fiscal deficit. As seen, Sudan does not fulfill this condition. Moreover, a measure of the fiscal impulse, defined as the ratio of spending to revenue is used to further examine the net effect of these variables on the business cycle, (Agenor et al 2000).

[8] Generally countercyclical fiscal policy should increase public spending when output is below its potential and vice versa. But due to the complexities of measuring potential output, the co-movement of the cyclical components of spending and the GDP is utilized.

[9] The variables are detrended using the first difference; the Hodrick-Prescott filter gives similar results.

The estimated correlations contemporaneously and up to lag 2 are, respectively, 0.696 and 0547 and 0.223 and all are positive and statistically significant indicating that the fiscal impulse measure is procyclical and plays no role in short-run macroeconomic stabilization. Such procyclicality suggests that the institutional arraignments for tax and spending are largely uncoordinated, which in line with predictions of the patronage literature and partially explains Sudan's deplorable rank on the quality of budget institutions shown in Gollwitzer, (2010).

Third, the contribution of the budget to the sustainability of public finances emerged as a major concern especially in the context of reaching the decision point for accessing the Heavily Indebted Poor Countries' facility for debt relief. Although there is no consensus about the suitable theory for assessing public finance sustainability, the method suggested by Trehan and Walsh (1988) is used. As argued therein, if real revenues, real spending and real debt are random walks, then, a stationary deficit (including interest payments) is sufficient to guarantee that the government fiscal policy has been sustainable. The Augmented Dickey–Fuller testing procedure is used for this purpose. The test confirms that, real revenues, real spending and real debt (in domestic price) have unit roots. However, with Augmented Dickey–Fuller statistic of (-2.292) the deficit (including interest payments) is non-stationary indicating that this series has a non-zero mean and that the inter-temporal budget constraint does not hold, confirming the eventual insolvency of the public sector. Also the debt sustainability analysis by the IMF, (2012) revealed that, Sudan is in debt distress. This outcome suggests that the high procyclicality of the fiscal variables also contributes to the insolvency of the government. In good times the tax yields are largely spent, while spending continues to grow in bad times even as revenues drop, which underscores a distorted fiscal structure.

Last but not least, there is evidence of large budget leakages and embezzlement. For example the latest Auditor General reports showed that in 2012 the unlawful earmarking (*Tagneeb*) was about SDG 1.09 billion and that SDG 175 million were embezzled which combined amounted to 4.0% of the total revenues. This figure excludes the frauds in banking sector, which are usually not disclosed. Also the 2012's report pointed to high cost overruns in two hydroelectric projects (Merowe dam related public works and the heightening of Al-Roseires dam), although the amount was not disclosed. The 2013's report indicated that the embezzled money is on decline, but earmarking is not. In this regard, it has been shown that, out of the 237 auditable public entities, fifty entities have not submitted their accounts, six refused to submit even when requested and ten continue earmarking funds. The size of budget leakages and embezzlement, in percent of total revenues, was found lower than in 2012 (3.8%), yet it is a concern. Despite the growing misuse of public resources, the auditor's recommendations are rarely implemented in full, for example, as indicated in 2013 report, only 26% cases reported for the financial year 2011 are successfully sued.

Weak budget institutions are usually associated with 'extractive states' or 'natural states' according to the doctrines developed, respectively, by Acemoglu and Robinson 2001 and North et al (2006) for the transition of emerging states to democratic states with inclusive institutions[10]. In this regard, the system of the patron-client networks becomes crucial for identification and hierarchicalization of power relations. Political patronage has been used for long time by the private sector in absence of state institutions to provide solution to the collective action problem, and is increasingly utilized in different ways by the successive politician elites with varying impact on the budget. The Khalifa used the system to build the Mahdist state. During the Condominium rule, the system was deemed essential for ruling Sudan. As proclaimed by Kitchener, it was through these elites that "we may hope gradually

[10] According to North et al (2006) the institutions of the more developed countries emerged as a result of the transition from 'limited access orders (LAOs)' or 'natural states', to 'open access orders' (OAOs). The move from LAO to OAO involves transition through three broad stages along a spectrum of LAOs that include fragile, basic, and mature states and is characterized by high degree of separation of economic organizations from the political organizations.

to influence the whole population" (Salomon 2004). In the post-independence period the system enmeshed into the formal public institutions of governance, (Holt and Daly, 1988). The various arrangements discussed for Sudan include; land licensing and absent landlords, (Young 2013), nationalization to weaken political opponents (Tingor 1987), privatization favoring party cronies (Suliman 2007), peace coalitions (Leach 2011, Ahmed 2008 and De Waal 2014b) and intermediation as well as empowerment (Al-Affendi 1991, Mann 2014 and Elzobier 2014) and more recently outsourcing of public services. The political patronage is informal, and its effects on the budget can only be assessed indirectly. As noted in section (3.2), the government size fragmentation and the voracity effects can be used as indirect tests.

Between 1953 and 2013 the legislative branch took various forms, (table 2); however, seats allocation through election or appointment is largely based on geographical constituencies. As from 1971 the system of governance moved from two-tier to three-tier system: central, state and local authorities (see table 3). In 1991, the legislative branch was composed of the National Assembly and the States Council. The state governments, in the second tier, were largely outpost of the central government and subject to strong supervision and control, while the localities evolved as multi-purpose territorial administrative units and remained highly diversified. The second tier of the system is usually formed through various amalgamations of the localities and overtime remained financially dependent on the federal government as reflected by figure (8), the state spending mimics that of the federal government and is dominated by recurrent expenditure. In addition, figure (9) reveals that, over (2000-2010) the geographical distribution of the federal transfers are largely unrelated to the state needs (measure, e.g., by poverty rate) and the state revenue generating capacity. In fact, the transfers are negatively correlated to poverty rates, with Pearson correlation coefficient of -0.52, significant at less the 5% as well as with state own revenue (-0.41) but statistically not significant. Also, expenditure leakages at the state level are substantial (World Bank, 2011). These results show lack of incentive to devise non-distributive program, which is consistent with the prediction of the patronage literature.

Moreover, figure (7) indicates clear association between the legislature size, spending, fiscal deficit and public debts adjusted for means and ranges. Further testing using bivariate Granger causality method shows that there are significant positive short-run and long-run unidirectional causalities running from the size of the legislature to spending as well as significant positive long-run unidirectional long-run causality running to the fiscal deficit and foreign debt, (table 4). These outcomes suggest that the *politicians* have incentive to increase the share of *discretionary expenditures* in order to dispense patronage to needed allies.

The extent to which the strategic choices of the contesting groups and the pressures for peace building typify a 'voracious behavior' is tested through a cointegrated VAR model. The model includes; real spending per capita, real GDP per capita, two step dummies and is estimated with restricted linear *deterministic trend*. Table (5) highlights the empirical model and the major results. As seen, lambda statistic is significant at less than 10% implying that the null of no cointegration can be rejected. The normalized coefficients showed that, the long-run elasticity of real spending per capita with respect to GDP per capita is 0.84 and the trend coefficient is 0.014, both significant at less than one percent. As noted earlier, the generalized impulse response, (GIR), functions, due to Pesaran and Shin, (1998), are used to interpret the results. The GIRs of real spending per capita to a positive 'productivity' shock, measured by one standard error shock to the real GDP per capita, is shown in figure (10). It clear that, in response to a given shock to real GDP, spending rises on-impact by 36% higher than the innovation in real GDP and the dynamic effects are also quite large and overtime revert to a base-level value greater than that of real GDP confirming the voracity effect. The robustness of this result to changes in ordering of the variable in the VAR is checked by one standard error shock to real spending per capita; *and figure (11) portrays the outcome. It is evident that* the on impact response of real spending is quite large, and has no effect on real GDP per capita. Overtime the response of spending to own innovations dominates and reverts to steady-state level value of 0.0657, which is above the base-level value of real income (0.0552) [11]. This 'non-Keynesian effect' indicates that the government expenditure programs are largely driven by political redistribution considerations rather than being motivated by genuine corrective economic policy, which corroborate the voracious behavior. Although the main models of distributive politics assume away the problems of agency loss due to the direct connection between voters and politicians; the principal-agent problem of the bureaucracy may have worsened due to the lack of transparency. The agent (civil service) may tend to use their private information to overestimate spending and pocket the difference; and, or, to collect and earmark revenues. As noted earlier, *the Auditor General Reports documented substantial budget leakages in recent years. Also* the World Bank's (2011) tracking study of the state-level health expenditures shows that, according to the facility-level data only 27.0% out of the 45.4% of total health expenditure allocated by the state to the facility level are actually received. *Reforming the civil service is debated as a major development problem in Sudan, (UNDP 2014). In this regard, Sudan can learn from its own history. During the Mahdist state, the Khalifa managed to balance loyalty and professionalism; about 30% of the finance officials were foreigners, no doubt appointed on merit. Endorsing* the system of meritorious professional civil service would seem like a rather viable means of initiating a long needed return to fiscal sustainability and political reform.

Overall, the evidences suggest that the predictions of political patronage model have been all too well fulfilled in the case of Sudan. The combined consequence of the government fragmentation and the voracity effect translates into weak fiscal intuitions and fiscal policy outcomes with serious negative repercussions on economic growth. It is known that the distribution of public funds through political patronage creates oblique and non-transparent budget process. Although Sudan has recently established a budget planning process, (World Bank, 2007), serious political reform is needed to enhance the value-increasing patronage networks and institute the *external consultation without which* the budgetary process would remain largely ritualistic. In addition, empowering the Auditor General office including through implementing its recommendations should provide effective budget oversight.

7. Conclusion and Policy Implications

Forging a coherent framework for appreciating the effects of the political institutions on fiscal institutions and macroeconomic management presents grave challenges. However, this chapter draws from the critical-juncture/path-dependence framework to identify the major policy changes in Sudan and assess their impacts on restructuring the source of public finance and how, in turn, this affects the major fiscal outcomes. The results suggest that Sudan has experience two critical junctures that significantly determined the structure of public finance and molded the subsequent developmental choices including the macroeconomic management. The consolidation of change agents around new ideas played crucial role in the first juncture that set the path of Sudan's economic extractive industry. The Mahdist state (1881-1889) is highlighted in background of the first juncture. Although short lived, this state had left enduring legacy involving trio variables: political Islam, place and ethnicity, which set the main axes of the partisan cleavages and social contestations even in the contemporary Sudan. Since the endowment of natural resources (land and water) has no significant causal connection to the formation of political elite preferences, place was used, at that time, to symbolize 'tribal' superiority and inferiority.

[11] This outcome contrasts with the conventional Keynesian effect where a positive shock to government spending, particularly during bad times, effectively increases the real GDP in the short-run and contributes to long-term growth by raising the productivity in the economy.

The Anglo-Egyptian Condominium featured the first juncture associated with transformation of agriculture from subsistence to market production. Commercialization took two forms; cash crops for export and staple food for local market, while sustaining the traditional agriculture as source of food and cheap labor. The extant institutions particularly, the partnership and the patronage arrangements, were effectively deployed in the creation of 'the state' and the elite class. Irrigated cotton is produced by the state in partnership with the tenants, which was a unique arrangement in the colonies, (Gaitskell 1959; Daly 1986 and Tignor 1987). Existing patron-client relationships were legitimatized as 'native administration' mandated with natural resources' distribution and management together with responsibilities for dispute settlement. The resulting structure of state socialism survived into the present day Sudan. Since mid 1970s, however, the shift towards policies of greater centralization of power and standardization of the lower-tier of the state's administrative institutions, without regard to the functional and territorial differentiation, have contributed to the undermining of the institutional arrangements underlying the territorial dynamics in the traditional agriculture.

The second juncture is triggered by successive drought shocks in mid 1980s and compounded by the structural fluidity of the indigenous native administrative institutions caused by power centralization to reach the crisis proportions. It is known that successive droughts, and the ensuing preference for more diversified farm-holding and herds' mobility, tends to trigger preferences for dramatic changes in the indigenous communal usufruct rights to land favoring move overlapping rights of access, (see Nugentand Sanchez, 1999). However, after the abolition of the native administration in 1983, the lack of creditable alternative institution to mediate and coordinate people's changing adaptive processes and production strategies has led to unprecedented proliferations of boundary disputes that escalated into open civil war in Darfur and Kordofan. Since the rural areas became the site for civil wars and conflicts, the resulting violence and insecurity has significantly eroded the rural-rural cheap labour exchange and rural-urban food market linkages, which are the major external source of increasing returns of cotton, the historic source of public finance and foreign exchange earnings. The chosen policy programmes to redress the process of declined expounded different ideas of national salvation, but all failed to revive cotton production and or promote alternative sustainable source of public finance and inclusive growth. Since independence no clear reform ideas are introduced aiming to change the inherent development path. In particular, the fiscal and budgetary reforms are rare. Even the notable attempts made focused on increasing revenues and are initiated in response to the structural shift in revenue source as manifested in shift from cotton, to oil and later on to gold. While ideas, in terms of the analytical framework, played important role in consolidating the change agents to create the path, they failed to engineer a new economic paradigm that could help avoid the process of the path destruction.

The patron-client relationships developed as the main mechanism that reproduced the legacy of the political extractive institutions. The prioritization of vested political interest and the neglect of the underlying fundamental economic forces have translated into high political fiscal biases, high procyclicality and insolvent fiscal system. In addition, the gradual centralization of patronage networks to reinvigorate the exclusionary power base of the successive ruling coalition has, overtime, undermined the crisis management capacity of the state, which explains the collapse of irrigated cotton, various other agricultural activities and later on the secession of South Sudan.

The narrative of the chapter suggest that Sudan ranks toward the fragile end of the spectrum of 'natural states' in accordance with the doctrine developed by North et al (2006) and others. The capture of the state and policy-making process becomes strategic in the processes of elite bargaining and coalition building, which not only undermined credibility of economic policies including the fiscal policy, but failed to deliver self-sustaining systems of basic social order. Hence, political reform should focus on sanctioning the state independence from the elites' capture including through drafting permanent constitution to promote competitive and inclusive political system. The fixation of essential rules to structure the state's fiscal institutions away from party politics is a critical component of the technology of commitment and is inevitable for anchoring the public policymaking process. In addition the formalization of the land usufructs rights, as an integral part of a long term decentralization plan aiming to enhance the territorial dynamics would broaden the access to state patronage and contribute to more inclusive growth. Although, in principle, territorial development policies are considered inconsistent with the benefits of agglomeration, (World Bank, 2009); Sudan featured a case where the relationships between the national and local institutions of the state are historically conflictive. The greater centralization of power has disrupted the balances of power among the rural communities and undermined the ability of the local institutions to enhance the value of the local geographic assets.

Moreover, improving the civil service is an absolutely necessary requirement for effective policy implementation. In the 1950s and 1960s the politicians appreciate the role of autonomous and professional civil service in increasing state revenues and the incomes of private cotton elites. Also, at the time of the Mahdist state, the Khalifa balanced loyalty with professionalism by outsourcing 30% of finance bureaucrats. Reforming the civil service away from politics and patronage networks is key to achieving effective and independent state policy and efficient delivery of public services.

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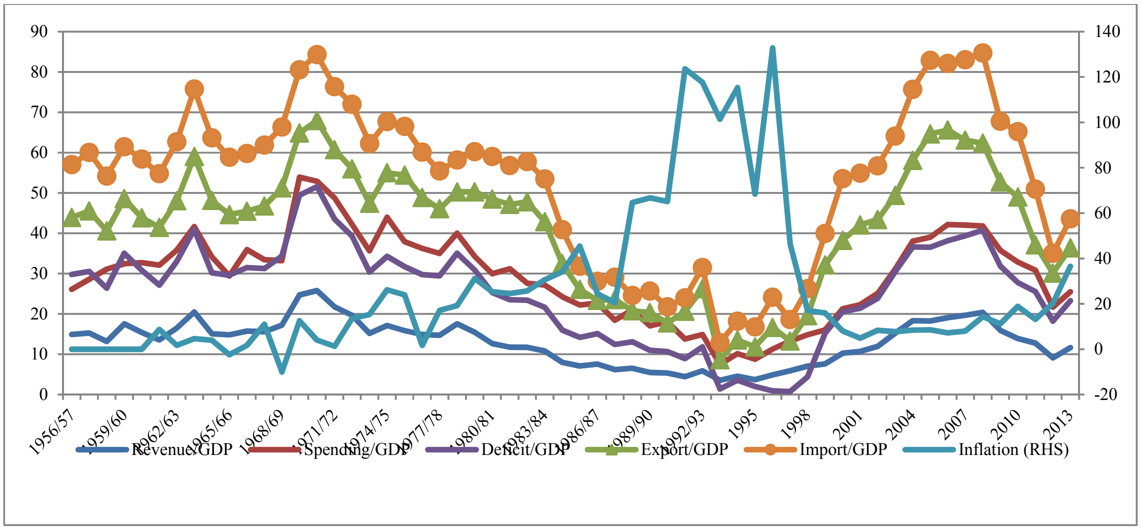
Figure 1: Public Revenue, Spending and the Deficit



Source: Ministry of Finance and National Economy Economic Survey's and the Bank of Sudan's Annual Reports and IMF Sudan statistical annex

Figure 2: Production, Area and Yields of Major Crops

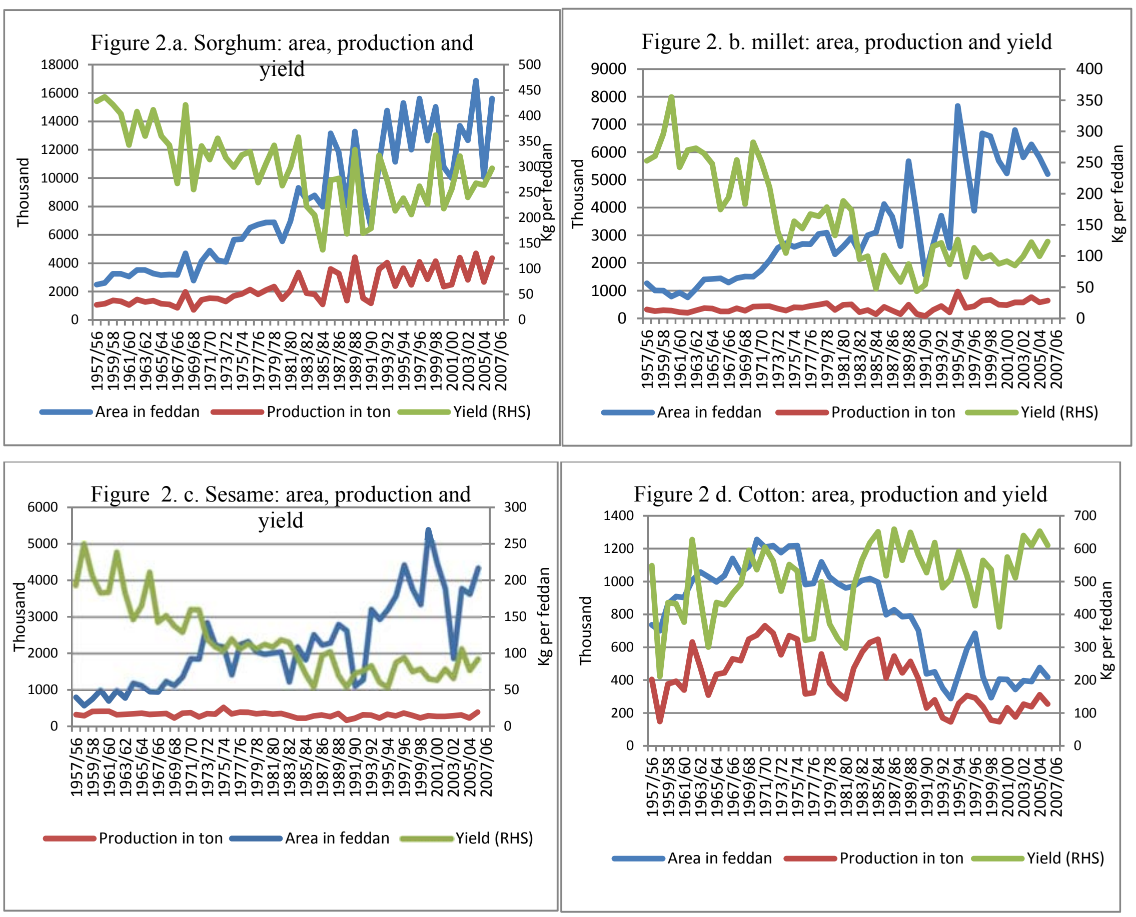
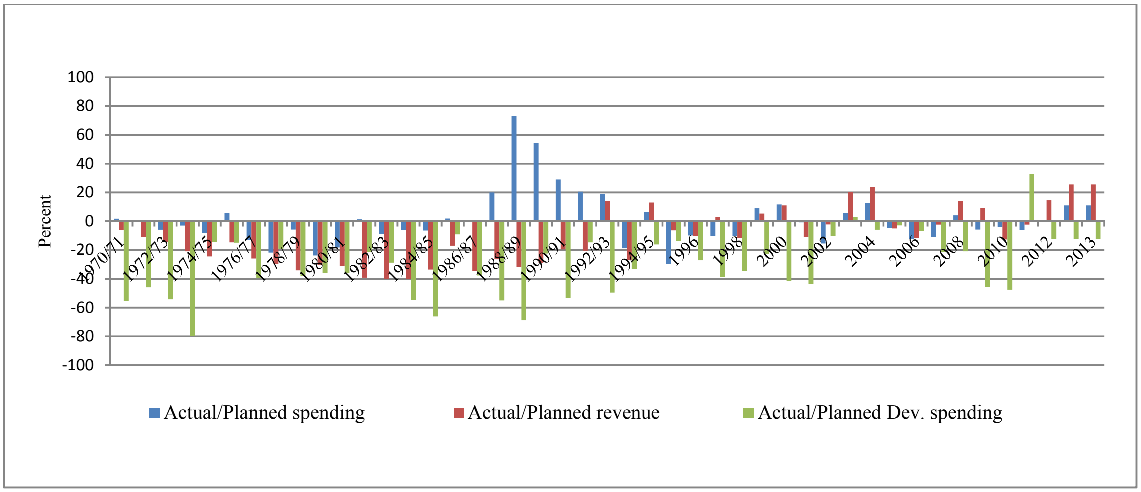
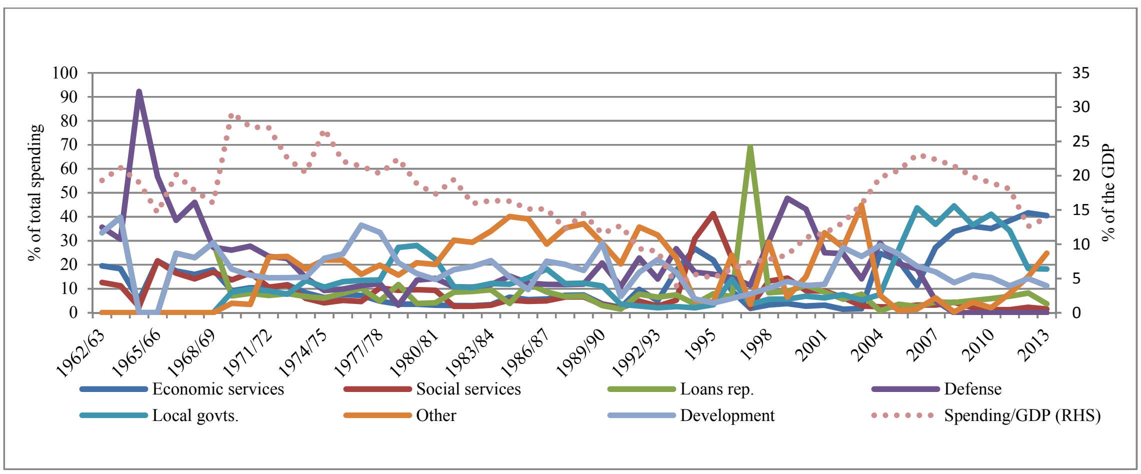


Figure 3: Deviations of Actual Revenue, Spending and Development Spending from Budgeted Amounts



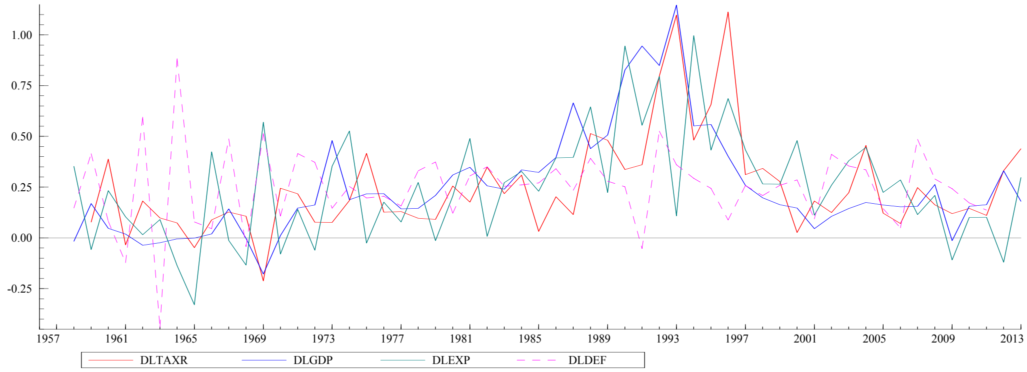
Source: Ministry of Finance and National Economy Economy's Surveys and the Bank of Sudan's Annual Reports

Figure 4: Public Spending by Major Components



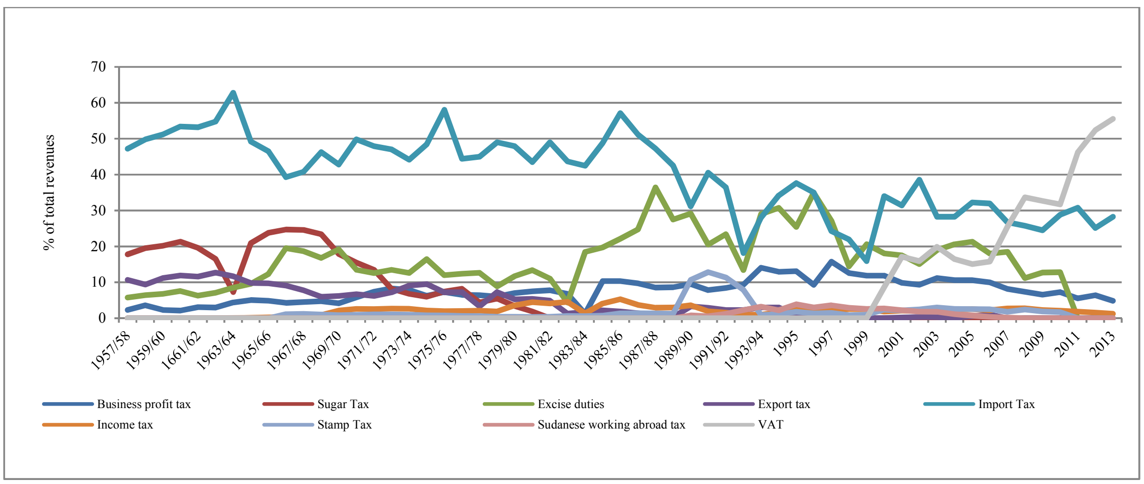
Source: Ministry of Finance and National Economy Economic Survey's and the Bank of Sudan's Annual Reports

Figure 5: The Log Difference of Revenue, Spending, the Deficit and the GDP Adjusted for Means and Ranges



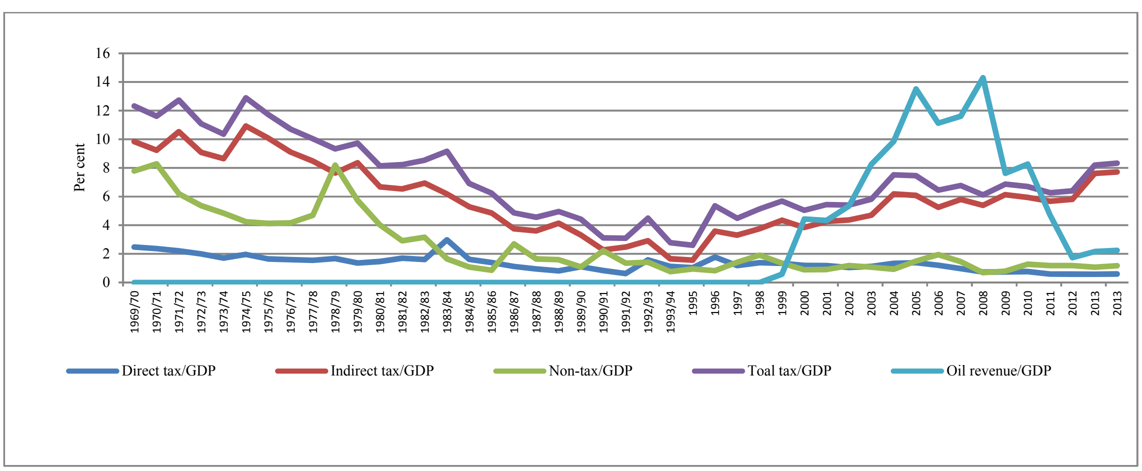
Sources: Ministry of finance and National Economy Economic Survey and the IMF

Figure 6a: Tax Yields as Percent of Total Revenue



Source: Ministry of Finance and National Economy

Figure 6b: Sources of Revenue as Percent of GDP



Source: Ministry of Finance and National Economy

Figure 7: The Size of the Legislature and the Evolution of Spending, the Public Deficit and Debt

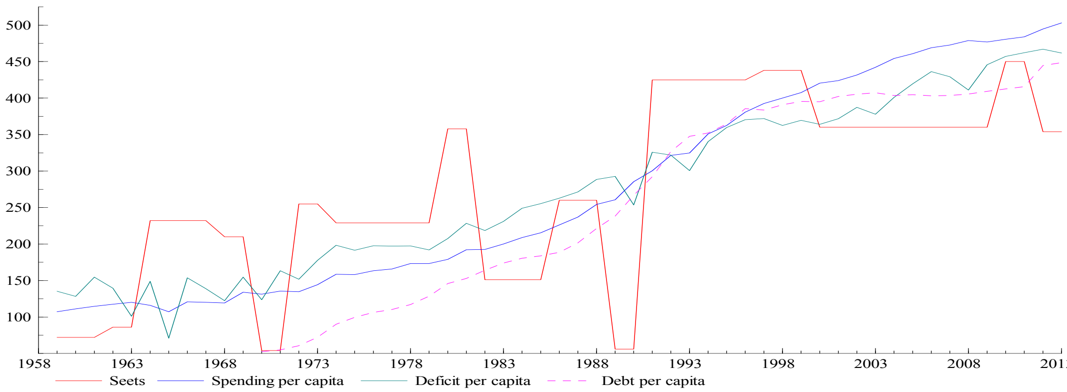
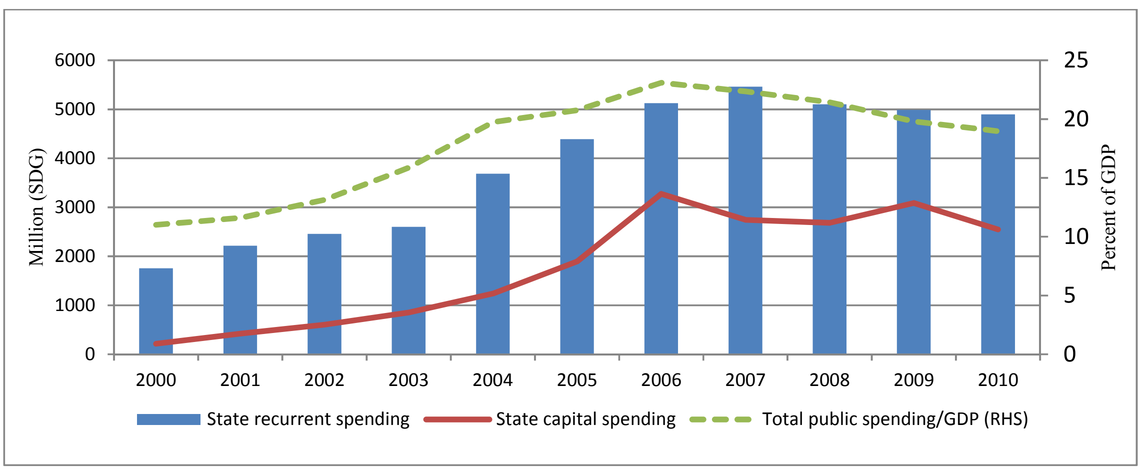
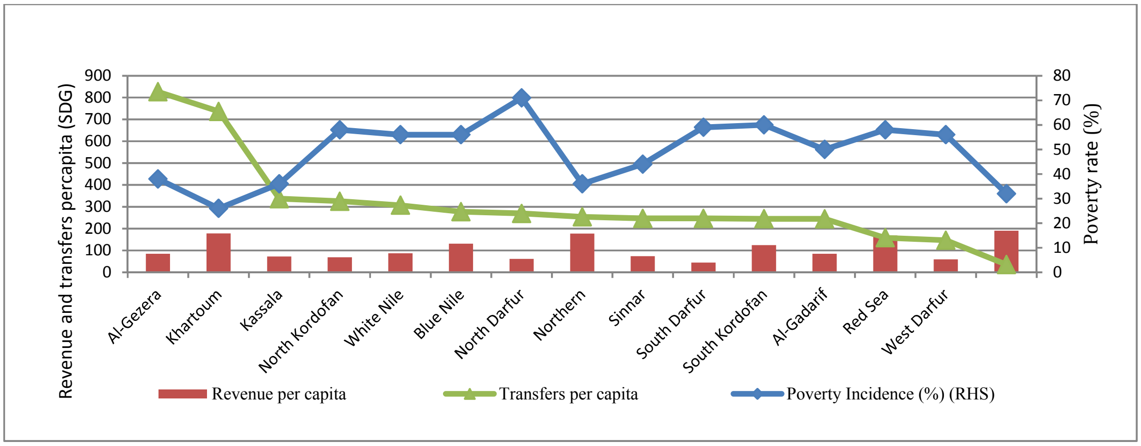


Figure 8: Federal and State level Expenditures



Source: the World Bank (2014) Sudan: State-level Public Expenditure Review

Figure 9: Federal Transfers, State's Poverty Rate and Average Per Capita Revenue, 2000-2010



Source: Ministry of Finance and National Economy

Figure 10: Generalized Impulse Response(s) to One S.E. Shock in the Equation for the Real GDP Per Capita

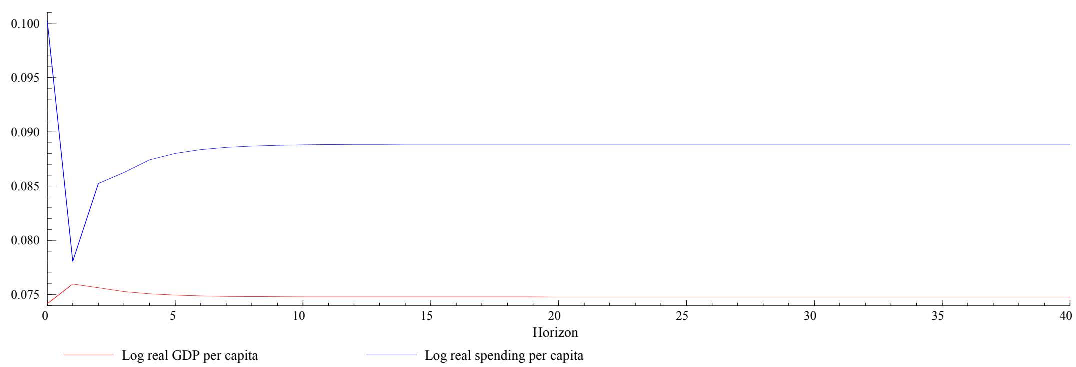


Figure 11: Generalized Impulse Response(s) to One S.E. Shock in the Equation for Real Spending Per Capita

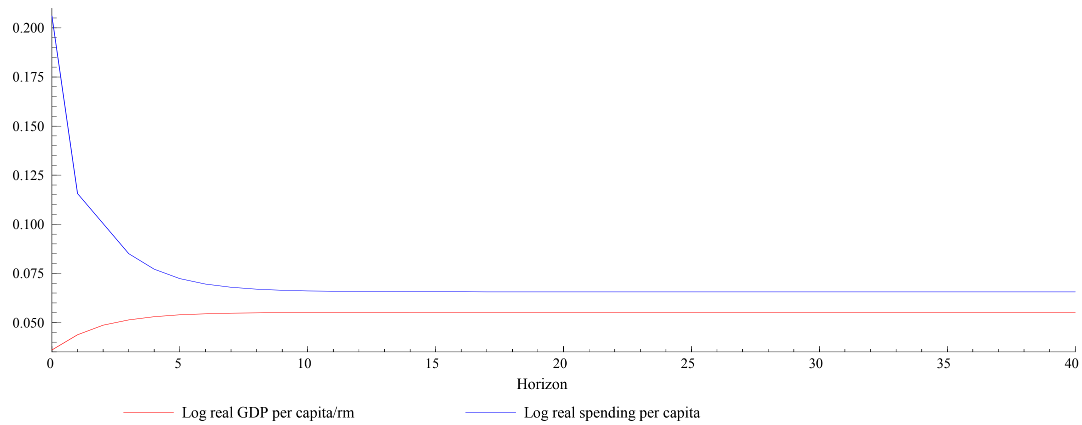


Table 1: Selected Macroeconomic Indicators

Event	Variables					
	Years covered	Minimum	Maximum	Mean	Std. Deviation	Variance
A. The first war 1955-71						
Inflation	10	-10.03	12.61	2.849	6.385	40.773
Expenditure (%GDP)	10	11.20	25.40	18.04	3.799	14.440
External debts (% of GDP)	10	9.00	18.33	12.083	2.904	8.434
Fiscal deficit (% of GDP)	10	-4.97	1.16	-2.343	2.139	4.576
Real GDP growth	10	-3.58	6.92	1.910	3.762	14.155
No. of legislators	10	54	232	141.85	80.678	6508.9
B. The first peace 1972-82						
Inflation	11	1.67	31.14	21.887	8.367	69.998
External debts (% of GDP)	11	18.30	77.47	42.451	19.925	397.009
Expenditure (%GDP)	11	17.32	26.98	21.691	3.039	9.186
Fiscal deficit (% of GDP)	11	-9.68	-2.92	-5.455	1.963	3.854
Real GDP growth	11	-5.93	16.67	5.156	7.484	56.013
No. of legislators	11	72	232	157.82	77.374	5988.8
C. The second war 1983-2004						
Inflation	22	4.87	132.82	50.271	43.446	1887.557
Expenditure (%GDP)	22	3.91	19.74	11.474	4.288	18.385
External debts (% of GDP)	22	54.52	219.72	125.236	43.149	1861.794
Fiscal deficit (% of GDP)	22	-8.30	-.37	-3.131	2.957	8.744
Real GDP growth	22	-6.28	14.22	4.379	5.031	25.315
No. of legislators	22	16	438	312.45	140.475	19733.3
D. The second peace 2005-13						
Inflation	9	7.20	36.21	18.181	10.911	119.044
Expenditure (%GDP)	9	12.59	23.09	19.000	3.645	13.288
External debts (% of GDP)	9	58.07	95.50	71.778	12.411	154.024
Fiscal deficit (% of GDP)	9	-5.29	-1.05	-3.315	1.384	1.915
Real GDP growth	9	1.41	11.30	5.856	3.531	12.469
No. of legislators	9	354	450	378.67	40.52	1642.0

Source: Calculation based on Ministry of Finance and National Economy Economy's Surveys and the Bank of Sudan's Annual Reports

Table 2: The Legislative Assemblies in Sudan 1959-2013

Political system	Legislative assembly	Period	Seats	Method of election	Financial authority
Democratic	First parliament	1953-58	97	Election	Yes
Democratic	Second parliament	1958	222	Election	Yes
Military	Constitutional development committee	1958-61	72	Appointment	No
	Central Council	1962-64	86	Appointment and election	Yes
Democratic	*First Constitutional Assembly*	1964-67	232		Yes
	Second Constitutional Assembly	1968-69	210		Yes
Military	Revolutionary Council and *under secretaries of ministries*	1969-71	54	Appointment	Yes
	First People Council	1972-73	255	Appointment and election	Yes
	Second People Council	1974-76	229	Appointment and election	Yes
	Third People Council	1977-79	229	Appointment and election	Yes
	Fourth People Council	1980-81	358	Appointment and election	Yes
	Fifth People Council	1982-85	151	Appointment and election	Yes
Military	Transitory Military Council	1985	151	Appointment	Yes
Democratic	*Constitutional Assembly*	1986-89	260	Election	Yes
Military	Revolutionary Council and *under secretaries of ministries*	1989-90	56	Appointment	Yes
	Transitional National Council	1991-96	425	Appointment	Yes
	Second National Council	1997-99	438	Election	Yes
	Third National Council	2000-2004	360	Appointment and Election	Yes
	Fourth National Council	2005-2009	360	Election	Yes
	National Council	2010-2011	450	Election per the CPA, 2005	Yes
	National Council	2012-13	354	Withdrawal of South Sudan representatives due to Secession	Yes

Source: Karar, (1991) and Sudan National Council's website.

Table 3: The major features of the fiscal, monetary and territorial fiscal arrangements in Sudan (1821-2013)

Political system	Fiscal institution arrangement	Monetary institution arrangement	Territorial fiscal institution arrangement
Turco–Egyptian colonial rule 1821-1885	Annual budget including annual forecast of expenditure and revenue	No independent monetary institution. Copper is the dominant currency	Local administration based on seven provinces. Shaykhs and traditional tribal chieftains are authorized to impose tax and distribute land
Mahdist state 1885-1898	Monthly budget with no forecast of expenditure and revenue. Tax is set at 10% and expenditure are allocated according to Muslim jurisprudence	Biat el Mal issued legal tender and run exchange bureaus	Local administration based on seven provinces. Each province is governed by Amir with separate treasury subject to central control. Private land ownership and usufruct rights are discouraged
Anglo-Egyptian rule 1898-1956	Annual budget based on balanced budget rule and five year plans	No independent monetary institution. Egyptian pound is legal tender	1. Nine provinces were created. The Native administration was endorsed by the Courts Ordinance in 1925. Tribal dar (Nazara) was the basic administrative unit, and presided over by Nazir. Nazara was sub divided into Khuts, presided by Omdas; below Omdas were various Shaykhs and tribal chiefs. Nazirs, were authorized to impose tax, distribute land and settle disputes. 2. The Local Government Councils Act (LGCs) 1951 upgraded tribal dars “the Nazara” to rural councils and introduced urban-based councils.
First democracy 1956-1958	Annual budget based on approve ent scheme five year plans	No independent monetary institution. Sudanese pound is legal tender as from 1957	1. Nine provinces with the LGCs in the lower tier.
Militarily rule 1959-1964	Annual budget based on ten year plan (1961/62-1970/71)	Sudan central bank	Nine provinces with centrally appointed Provincial Authority (the executive body) chaired by Provincial commissioner. The LGCs is lower tier. The Provincial Authority links the LGCs (which were dominated by native-leaders) to the central government.
Second democracy 1964-1969	Annual budget based on ten year plan(1961/62-1970/71)	Sudan central bank	Nine provinces with locally elected Provincial Authority. The LGCs were in the lower tier.
Militarily rule 1969-1985	Annual budget based on: (i)Five year plan (1973/74-1976/77); (ii)Six year plan (1977/78-1982/83), which amended into two three year rolling programs (1978/79-1980/81 and 1981/82-1982/83)	Sudan central bank	1. Nine regions with centrally appointed Regional Authority. The Native Courts Ordinance was abolished in 1971.A three-tier quasi-federal system is created with five regional governments and the community councils are in the lower tier, presided over by the local government councils. After the 1973 constitution, the lower tiers units were dominated by the representatives of Sudan Socialist Union. 2. In1983 nine regions with quasi-parliamentary regional systems were introduced. The three-tier community councils continued.
Transitory government	Annual budget	Sudan central bank	Nine regions with centrally appointed Regional Authority, with three-tier local popular councils.
Third democracy 1986-1989	Annual budget based on (i) Action Program 1987 (ii) Four year salvation program (1988/89-91/92).	Sudan central bank	Nine regions with locally elected regions Authority. The 1987 Native Administration (NA) Bill reinstated the NA in the lower tier.
Militarily rule 1989-2014	Annual budget based on: (i)a series of three year salvation programs during (1990-2002) (ii)a macroeconomic framework is introduced in 2008. (iii) Three year recovery program (2011-2014)	Sudan central bank	1. In 1991-94 nine states based on federal structure with sixty provinces, and a new form of NA is created in the lower tier. 2. In 1994-1126 states 3. In 2011-14 the federal system continued with 16 states and NA in the lower tiers due to secession.

Table 4: The Bivariate Granger Causality between the Legislature Size and the Major Fiscal Variables/[1]

	Seats-Spending equation		Seats-Deficit equation		Seats-Debt equation	
Regressors	(ΔLS_{t-1})	(ΔLE_{t-1})	(ΔLS_{t-1})	(ΔLFD_{t-1})	(ΔLS_{t-1})	(∂LFB_{t-1})
Seats (ΔLS_{t-1})	0.062 (0.403)	-0.082* (-1.790)	0.022 (0.289)	-0.209 (-1.071)	0.055 (0.354)	0.001 (0.015)
Total spending (ΔLE_{t-1})	-0.403 (-1.242)	-0.149 (-1.462)				
Deficit (ΔLFD_{t-1})			0.089 (0.981)	-0.188 (-1.617)		
Debt (ΔLFB_{t-1})					-0.001 (0..958)	0.126 (0. 774)
$ECM1_{t-1}$	-0.099 (-1.501)		0.011 (0.554)		-0.134 (-1.344)	
$ECM12_{t-1}$		0.025*** (3.788)		-0.350*** (-2.961)		-0.105** (-2.227)
Federal dummy (D_{71})	-0.082 (-0.214)	0.275** (2.286	-0.114 (-0.287)	0.790 (1.549)	0.088 (0.224)	-0.062 (-0.338)
Federal dummy (D_{91})	0.081 (0.155)	-0.892*** (-5.574)	0.025 (0.063)	-1.294** (-2.558)	-0.065 (-0.124)	-0,223 (-0.985)
Constant	0.139 (1.446)	0.009 (0.373)	0.022 (0.289)	-0.027 (-0.278))	0.200 (1.472)	0.008 (0.177)
Normalized cointegrating vectors/4	ECM2=LS - 1.770*LE (-9.888) ECM1=LE - 0.565*LS (9.912)		ECM1=LS - 4.555*LFD (-4.643) ECM2=LFD - 0.220*LS (-4.603)		ECM1=LS - 0.897*LFB (-12.634) ECM2=LFB - 1.114*LS (-12.659)	
R^2	0.067	0.533	0.022	0.350	0.053	0.176
Durbin–Watson statistic	1.981	1.993	1.941	2.042	1.916	1.926
F-Statistic	0.671	10.720	0.210	5.065	0.380	2.257
Number of observations	53	53	53	53	42	42

Notes: 1/. The variable definitions: S is the number in the parliament; E is real spending; FD is the real fiscal deficit, FB is the real foreign borrowing and (D_{71}) (D_{91}) are two step dummy taking the value of 1 in 1971 and 1991 and zero elsewhere. These dummies are introduced to account for the major changes in the federal system. All variables are in real terms and expressed in logarithms. The estimation is over the period: 1959-2013. According to the Augmented Dickey–Fuller all the variables contain unit roots, thus, the bivariate Granger causality test for each column equations is obtained from estimating the following error correction model;

$$\Delta S_t = \delta_1 + \sum_{i=1}^{p} \beta_i \Delta S_{t-i} + \sum_{i=1}^{p} \gamma_i \Delta E_{t-i} + \alpha_1 [S_{t-1} - \eta_i E_{t-i}] + D + \mu_{2t}$$

$$\Delta E_t = \delta_0 + \sum_{i=1}^{p} \beta_i \Delta S_{t-i} + \sum_{i=1}^{p} \gamma_i \Delta E_{t-i} + \alpha_1 [E_{t-1} - \eta_i S_{t-i}] + D + \mu_{1t}$$; i =1, 2 and t=1, 2… n.

Where Δ is the first difference operator, δ , β , γ , η and α are coefficients, D contains the dummies and μ are IID errors. The null hypothesis of no causality between seats and spending equations in the first column requires that; the estimated coefficients $\sum \beta_i = \sum \gamma_i = \sum \alpha = 0$. For the first equation in the first column seats will Granger cause spending if either β_i ; the error correction term (α) or both are also statistically significant. The reverse causation applies for the second equation if either γ ; the error correction term (α) or both are statistically significant. In this case, the causality is bidirectional, otherwise it is unidirectional.

The lag length of the vector autoregression model underlying the cointegration is determined by Aikaike's information criterion; which selects lag order 2. The cointegration analysis is performed by the standard Johansen procedure. In all cases the cointegration test confirms the existence of long-run relationship between pair of tested variable. The normalized cointegrating vectors are all statistically significant and reported in the second row from below in the table.

Table 5: The Results of Cointegration Test Among the Proxies of the Voracity Effect /1,2,3

Eiginvalues	0.27282	0.079562	0.0000
Null Hypothesis, Rank ($\alpha\beta'$) = r	r=0	r≤1	
λ-max	17.5222*	4.5598	
95% critical values	19.2200	12.3900	
90% critical values	17.1800	10.5500	
Trace-statistics	22.0820	4.5598	
95% critical values	25.7700	12.3900	
90% critical values	23.0800	10.5500	
Normalized Cointegrating Vector	RGDPC	*RSC*	*Trend*
	1	-0.8416***	-0.0137***
	(0.0000)	(0.2116)	(0.0038)

1/. Source: See table (2) and figure (1) for the source of variables. Two step dummies over 1984-85 2005-2011 are induced to account, respectively for the drought shock and Comprehensive peace Agreement. They take the value of one over the specified period and zero otherwise. The estimation period is 1959-2013.

2/. Asterisks ***; ** and * denote, respectively, significance at 1%; 5% and 10% levels. Numbers in parentheses are symptomatic standard errors.

3/. Using the standard notation, (see e.g. Pesaran and Shin 1998), the real GDP per capita (RGDPC) and the real spending per capita (RSC) can be represented by the following vector autoregression (VAR) of a general order k;

$$x_t = \mu + \sum_{i=1}^{k} A_i x_{t-i} + \varepsilon_t \quad ; t=1, 2\ldots T.$$

Where $x = (RGDPC \text{ and } RSC)'$ is the column vector of 2x1 dimension; A_i ; i =1,…..k are 2x2 matrices of unknown coefficients; μ represents 2x1 vector of unknown deterministic terms (including intercepts) and ε is IID disturbance term with zero mean and constant variance. Assuming that the variables contain unit root and using the first difference operator, $\Delta x = (x_t - x_{t-1})$ the above equation can be re-parameterized as follows;

$$\Delta x_t = \mu + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + \alpha\beta' x_{t-1} + \varepsilon_t \quad ; t=1, 2\ldots T$$

where $\Gamma_i = -\sum_{r=i+1}^{k} A_r$ and $\alpha\beta' = -(I - \sum_{i=1}^{k} A_i)$, α and β' are (2, r) full-rank matrices of the adjustment factors and cointegrating vectors respectively; with r being the number of expected cointegrating vectors.