The Subnational Political Resource Curse: Allocations, Internally Generated Revenue and Spending Priorities in Nigeria

Toluwanimi Segun

Contents

Abstract

I argue that Nigerian states' interest in Excess Crude Account revenue is driven by a fiscal devolution stalled by allocation reliance. Allocations allow states to avoid accountability to the center and citizenry. The political curse theory predicts that allocation-reliant states reduce taxation in to reduce scrutiny and increase spending to induce apathy. In the literature also lies a silver lining: if taxes increase, increased participation may induce developmental spending. I model Nigerian state revenues and expenditures to determine whether they operate in line with these predictions. My strongest finding is that allocations displace local revenue. Findings are limited by data quality.

1　Introduction

Oil wealth comes with a caveat-depend on it excessively and be buffeted by oil market volatility (see De V. Cavalcanti, Mohaddes, & Raissi, 2014). The 2014 oil price crash revealed that Nigeria did not heed this warning. The country's expenditure forecasts are based on an assumed oil price so that the government was caught flatfooted when the crash began around June. Under duress, public officials eventually revealed how financially irresponsible governance was during the years of plenty: after a tussle with the President, State Governors shared oil profits stowed in a "rainy day" account called the Excess Crude Account (ECA) amongst themselves; they allegedly also hindered the growth of the country's Sovereign Wealth Fund (Federal Ministry of Finance, 2015).[1]

It does not seem like those hard-won funds were spent in the public's interest-reports detailing several state governments' inability to fund public investments and pay public servants' salaries have continued to arise into 2018.[2] A less dramatic iteration of the struggle for funds continues at the time of writing. The Federal Government (FG), state and local governments are about to convene to review the formula that determines the portion of revenues each tier of government gets.[3] It is expected that state and local governments will each demand a bigger share of revenues, reducing the amount held in the center (Fabiyi, Affe, Chiedozie, & Ajaja, 2019).

Nigeria's Economic Recovery and Growth Plan (ERGP) is a policy document that details the country's plan to implement sustainable growth over the medium term. It notes that Nigeria will seek to increase public investment, diversify economic outputs and reduce fiscal reliance on oil moving forward.[4] But as the ECA fiasco shows, state-center relations will influence the success of the reform program. The ability of state governments to successfully contest decisions made at the center indicates that state-center relations are bilateral-this is important for any federation. However, it also poses some less optimistic questions about state-*society* relations: If devolution of power incentivizes subnational officials to better respond to their constituents (Faguet, 2012), why did it take an oil price crash for said constituents to find about their governors' clamor for ECA

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[1]The Finance Ministry (2015) states: "[The] savings in the ECA would now have been higher but for the fact that a number of governors, against strong professional advice, actively kicked against continuous building up of the ECA and, indeed, pushed for its sharing. It is on record that States even took the Federal Government to court on this matter, and the case is still pending at the Supreme Court... [it] is also a matter of public knowledge that the [Sovereign Wealth] Fund would have generated more savings and investments if the same sort of opposition that blocked savings in the ECA had also not been at work" (n.p.).

[2]BudgIT (a civil society organization focused on promoting fiscal transparency) notes that, as at October 2018, as many as 12 states owed public servants' salaries. This occurred despite a bailout package of around N 1.8 trillion which the FG earmarked specifically for paying salaries. Furthermore, states allegedly advised workers to not disclose the situation to the public (Odunsi, 2018).

[3]The review is scheduled to begin on August 15th, 2019.

[4]Specifically, it seeks to increase the share of non-oil exports in total exports to about 34 percent in 2020 from 22 percent in 2016 (Ministry of Budget, 2017).

revenues?[5] The same premise implies that state governors should have spent these extra funds in the interest of citizens; this does not match with the reality of states owing public servants' salaries. Perhaps most pressing, why were state governors fighting for rainy day funds at all? They have power to collect certain taxes in their jurisdictions. Some proponents of decentralization suggest that, with fiscal devolution, they should rather be competing amongst themselves for citizens' incomes and investments by "reducing public sector waste, inefficiency, and corruption, and by providing infrastructure" (Faguet, 2012, pg. 163).

I argue that this behavior is evidence of a fiscal devolution stalled by an excessive reliance on federal transfers (allocations henceforth). An incomplete fiscal devolution implies that the state governors' performance incentives do not lie with the people. This allocation reliance is enabled by abundant oil revenues and the nature of the allocation formula, which allows for a fairly constant share of total revenues to be allocated to each state. Both factors driving allocation reliance are addressed in the budding subnational political resource curse literature; it is thus the primary framework for this analysis. This literature considers that when allocations form a large part of a subnational budget (i.e. allocation reliance is high), they are to the subnational unit what resource rents or foreign aid can be to national governments. Namely, when it receives an allocation windfall, a state government reduces costly local taxation (in this paper, internally generated revenues or IGR) in order to avoid citizen scrutiny and demands for accountability (*taxation effect*). It also increases spending on items that drive citizen quiescence, such as high salaries and lucrative procurement contracts (*spending effect*) (Gervasoni, 2010). Nigerian states thus sit in a grey area of accountability: on the one hand, successfully contesting the center for ECA funds, also able to challenge for a majority share of the revenue pool, on the other hand using allocations to create a buffer of political apathy between state government and society.

The empirical literature tends to test the stages of the taxation effect separately. The evidence on the displacement of internally generated revenues by allocations is mixed. Some studies find that allocations reduce internal revenue generation (Benin and Mogues, 2012; Gervasoni, 2010), but allocations have also been found to encourage IGR collection (Masaki, 2018). There is more convergence on the relationship between composition of subnational revenue and government responsiveness. Studies find that an increase (reduction) in IGR in the budget is positively (negatively) associated with government responsiveness, or on the demand side, citizen demands for accountability. "Responsiveness" here has been operationalized as an increase in the share of public investment in the budget (thus countering the spending effect) (Hoffman and Gibson, 2005), legislators spending more time delivering services in their constituencies (Elemo, 2012), the congruence between citizen and policymakers' preferences (Mahdavi, 2018), the provision of local drainage services (Poeschl, 2015), and increased

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[5]In this paper "subnational" is an umbrella term for both state-level/provincial governance and district or local governance; especially when discussing the literature (except where noted), I do not make any distinction. However, my own empirical investigation refers solely to state level dynamics.

quantity and quality of subnational education infrastructure (Gadenne, 2017). In some sense, these findings prescribe a way out of the political resource curse: complete the fiscal devolution by increasing states' reliance on local revenues. Results also support the first link of the spending effect hypothesis; oil windfalls to Brazilian municipalities resulted in increased spending, likely diverted to patronage and embezzlement (Caselli and Michaels, 2013), and increased transfers led to an increased payroll size in Argentina (Gervasoni, 2010).

This study represents an attempt to test for both tax and spending effects in the Nigerian subnational context. It is not the first to do so; Elemo (2012) found that increases in IGR in subnational units led to greater public investment and legislators spending more time on service provision in their constituencies. It however differs in data and methodology. While Elemo looks at data from 1999 to 2009, my dataset covers 1961 (one year after Nigeria received her independence) to 2016. The data is aggregated for all states; it also aggregated over components of IGR and subnational expenditure. The analysis is thus limited in important respects, and my conclusions are accordingly cautious. The nature of the data also informs the use of time series analysis, although there are precedents within the national political resource curse literature.[6]

In the initial analysis I use a parsimonious Vector Autoregression (VAR) to test for the dynamic interrelations between allocations, IGR, recurrent expenditure, capital expenditure and GDP per capita. I find that, in line with the taxation effect hypothesis, an allocation shock leads IGR to fall. An IGR shock increases capital expenditure and decreases recurrent expenditure, but the result is not significant. An allocation shock generates largely indeterminate responses from recurrent and capital expenditure, suggesting that rent distribution may occur through channels not reflected in the budget or in ways that are not systematically evident at the study's level of aggregation. I then use an Autoregressive Distributed Lag (ARDL) to further investigate the relationship between allocations and IGR. I find that the displacement of IGR by allocations is intensified in election periods, but the result is not robust. I also find that the variables have a negative long run cointegrating relationship with slow short run adjustment. Due to data limitations, I largely refrain from discussing the implications of my findings for the literature. I rather detail how these data issues limit the analysis.

Section 2 presents an overview of revenue allocation in Nigeria. Section 3 briefly reviews related literature in further constructing the argument. Section 4 presents the data and methodology, Section 5 the estimation and results. Section 6 discusses limitations and concludes.

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[6]Namely Haber and Menaldo (2011), Anderson and Ross (2014). Fadiran (2015) applies time series methods in studying the relationship between oil, institutional quality and economic growth in Nigeria.

2   An Overview of Revenue Allocation in Nigeria

The clamor for ECA funds reflects a Nigerian legacy of focusing on revenue sharing to the detriment of revenue generation efforts. In the short term at least, this over reliance has been fostered by the country's access to rents in the form of oil revenues. Consider in 1 how the Organization of Petroleum Exporting Countries (OPEC) price basket co moves with Nigerian federal oil reliance (oil reliance) and state allocation reliance (allocation reliance). The existence of strong alternative revenues-IGR- would dampen the high correlations visible on the graph.[7] As it stands, certain state governments are not able to survive without allocations from the center; in 2017 17 states did not generate up to 10 percent of their allocations (Economic Confidential, 2018).

Deeper causes of allocation reliance are also rooted in oil. Its discovery in the then Eastern Region in 1958 caused the practice of returning mining rents to their origin to be discontinued in favor of sharing them through a federally managed account. The colonial administrators' overriding concern was that an exponential increase in oil revenues to any one region would upset the balance of national development. The so called derivation principle was thus dropped in favor of considerations of population and balanced development. This marked a shift in how regions approached their financing. Up till then, regions considered and implemented schemes to increase revenues with more vigor; invariably these involved increased taxation of economic activity (Uche & Uche, 2004).

Today, the FG receives half (52.68 percent) of (mainly oil) revenues accruing to the federation account.[8] State governments receive 26.72 percent, while local governments receive 20.60 percent. The disbursement is overseen by the Federal Accounts and Allocations Committee (FAAC). Between states, revenue is shared based on two kinds of principles. One ensures that a relatively fixed proportion is given to each state, i.e. share of revenues allocated is fairly constant over time. Most revenues are shared in this way. Such principles include equality, on which 40 percent of revenue is shared; population (30 percent) and landmass and terrain (10 percent). The other set of principles depend on state performance in revenue generation (10 percent), social development (2.4 percent), primary school enrollment (0.8 percent), health (3 percent) and water conditions (3 percent). Finally, 13 percent of oil revenues is shared between oil producing states according to their contribution (a reinstatement of the derivation principle). This disbursement does not go through the federation account (Emengini & Anere, 2011).[9] All budgetary allocations are shared without conditions.

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[7]This would hold unless IGR is also positively associated with the OPEC basket. It is not, the correlation between both variables is -0.36.

[8]The allocation formula has undergone a few changes since 1958. See Emengini & Anere (2011) for a review.

[9]Oil producing states are: Akwa-Ibom, Rivers, Delta, Cross River, Edo, Bayelsa, Abia, Ondo, Imo, Anambra, and Lagos State.

Figure 1: Oil Drives Allocation Reliance
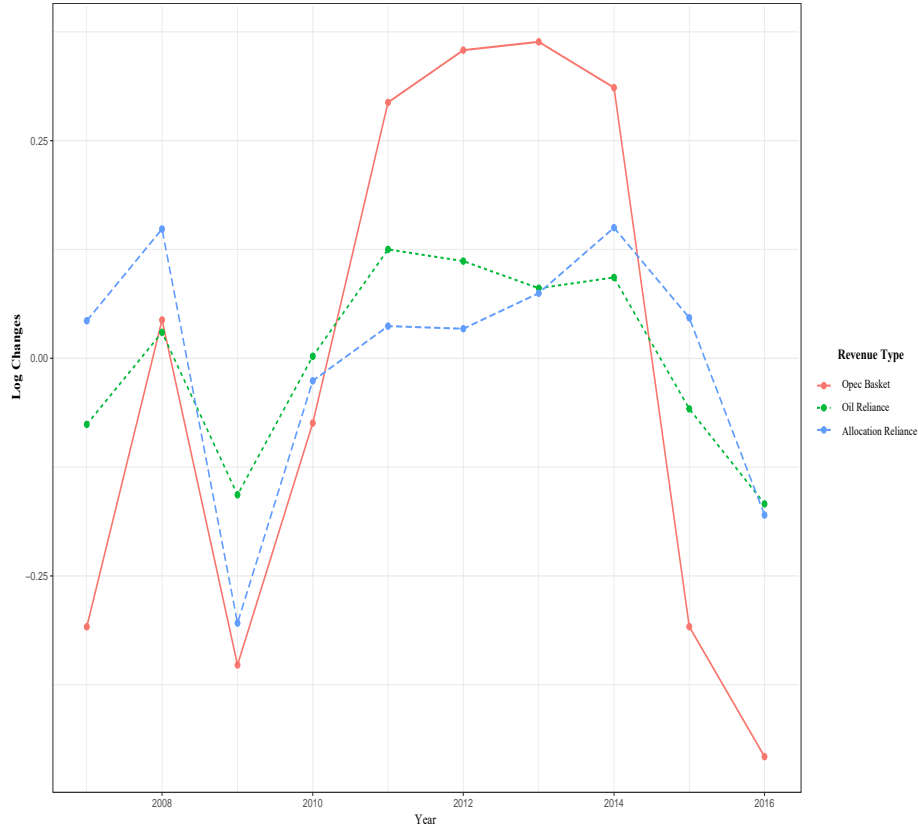
Federal oil reliance is calculated as oil revenues of total revenues; allocation reliance is allocations of total state revenues. Figure 1 shows all three variables scaled using natural logarithms and detrended to accentuate changes, running from 2007 till 2016. Detrending was done using the Hodrick-Prescott filter. The correlations are as follows: between allocation reliance and the OPEC basket, 0.72; between oil reliance and OPEC Basket is 0.91; between oil reliance and allocation reliance is 0.90. However, the correlation between the OPEC basket and IGR reliance (IGR of total state revenues, 2007-16) is -0.36.

The current formula retains the focus on even development espoused in 1958. Figures 2 and 3 show strong positive correlations between population and gross allocations in 2012 and 2016 respectively. From the above analysis, it is plausible that states which collect relatively more IGR may not be responding to the incentives in the allocation formula. Such incentives are overpowered by the non-performance formula component.

Figure 2: Allocations were Positively Correlated with Population in 2012
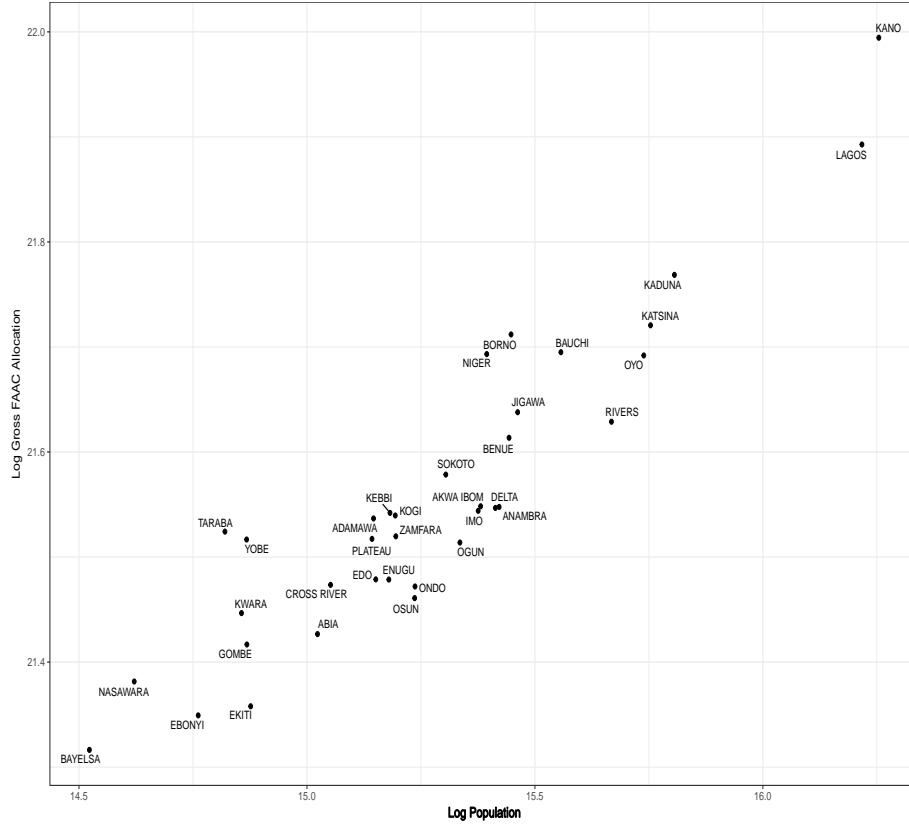
Figures for IGR, allocations and population in 2012 were obtained from the National Bureau of Statistics.

Figure 3: Allocations were Positively Correlated with Population in 2016
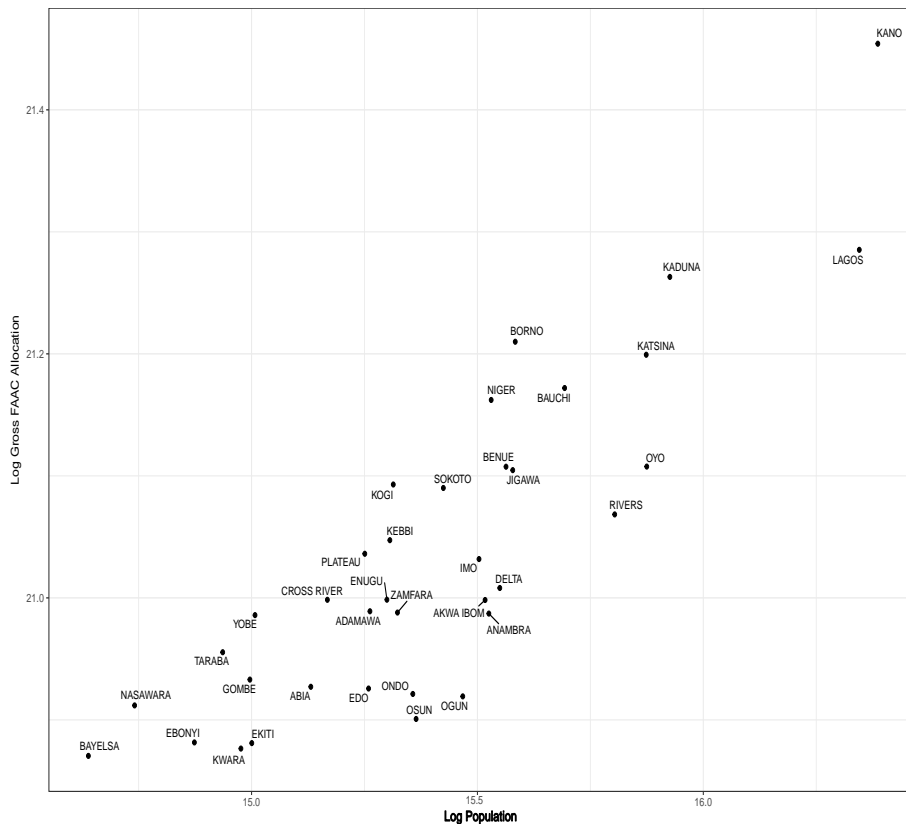
Figures for IGR, allocations and population in 2016 were obtained from the National Bureau of Statistics.

There is a substantial disparity in IGR collection (Figures 4 and 5), which is accordingly driven by outliers. IGR comprises of Pay As You Earn taxes (a form of progressive personal income taxation), Direct Assessment taxes (self-reported personal income taxation for entrepreneurs), Road Taxes, revenues from Ministries, Departments and Agencies (MDAs), and other taxes. Pay As You Earn (PAYE) and Direct Assessment consistently form most of IGR collection in the years disaggregated data are available.[10] I assume in this

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[10]The contributions of each component of IGR are not recorded over my full sample period. In 2010, PAYE formed about 48 percent of IGR; Direct Assessment formed 3.5 percent. In 2011 PAYE: 60 percent; Direct Assessment: 4.6 percent. In 2012 PAYE: 72.1 percent; Direct Assessment: 2.1 percent. In 2014 PAYE: 56.7 percent, Direct Assessment: 4.3 percent. In 2015 PAYE: 43.2; Direct Assessment: 2.3 percent. In 2017 PAYE: 48 percent; Direct Assessment: 2.8 percent. In 2018, PAYE 55 percent; Direct Assessment: 3.7 percent. The variation in contribution is also driven by whether states reported the full IGR breakdown. In 2013 for example, Lagos state only reported their total IGR. Since Lagos regularly collects the lion's share of PAYE, PAYE appears to have only contributed 29.5 percent of total IGR

analysis that the trend has held since Nigerian independence; when speaking about IGR it is PAYE plus Direct Assessments I refer to.

Figure 4 shows IGR per capita and gross allocations as a percentage of total allocations in 2012, during a period of oil price stability.[11] Figure 5 shows the same variables in 2016, after the oil price shock. While gross allocations constitute less of the total gross amount in 2016, save Ogun with a significant IGR improvement, each state's share and IGR per capita distributions are essentially the same.[12] The most notable outlier is Lagos; an economic and financial hub, in 2016, the state collected 37 percent of all subnational IGR (BudgIT, 2017).

3 Allocations, Subnational IGR Collection and Spending

So called fiscal theories of the state are marked by their emphasis on the fiscal relationship between national and subnational governments as an important variable explaining political outcomes (Gervasoni, 2018), in this case, tax collection and public spending. These variables are regarded as political because in the fiscal theories' tradition, tax collection partly determines government responsiveness: since collecting taxes requires quasi-voluntary citizen compliance, leaders are incentivized to create avenues of political participation (Campbell, 1993). Furthermore, subnational governments may spend locally raised revenues more efficiently than allocations as the former induce greater scrutiny and willingness to punish government (Martin, 2016; Hoem Sjursen, 2018).

Different approaches have been employed in trying to explain how allocations from a higher tier government can affect subnational tax collection and spending. One formalization of the median-voter model suggests that federal allocations crowd out subnational tax revenue. "Assuming an initial optimal balance between local public consumption and private consumption, additional intergovernmental grants would be passed on by local governments to local residents as reductions in local taxes and fees, other factors remaining unchanged" (Mogues & Benin, 2012, pg. 1055). The 'flypaper effect' literature seeks to explain the puzzle of subnational units spending more in response to an increase in lump-sum grants than to an equivalent increase in their constituents' income levels. An explanation for this phenomenon relevant to this paper is the 'costly taxation' model. It predicts that administrative and compliance costs drive increased responsiveness of subnational spending to allocations: where collection costs are high, subnational units will show a greater propensity to spend out

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that year. Dropping Lagos, PAYE: 58.4 percent; Direct Assessment: 4.5 percent. Similar discrepancies from other states have less dramatic downward effects on the result but are present. The data are gotten from NBS statistical bulletins of various years.

[11]The Total Gross Amount is Gross Allocations plus the Net Share of (Oil) Derivation, Distribution from the Excess Crude Account and the Value Added Tax (VAT) Allocation. Jigawa and Ebonyi did not submit totals in 2012 and were dropped. Figures for IGR, allocations and population in 2012 and 2016 were obtained from the National Bureau of Statistics.

[12]Beyond the fall in oil prices, 2016 data included foreign exchange allocations, which were absent in 2012.

Figure 4: Lagos and Oil-Rich States Collected More IGR per Capita in 2012
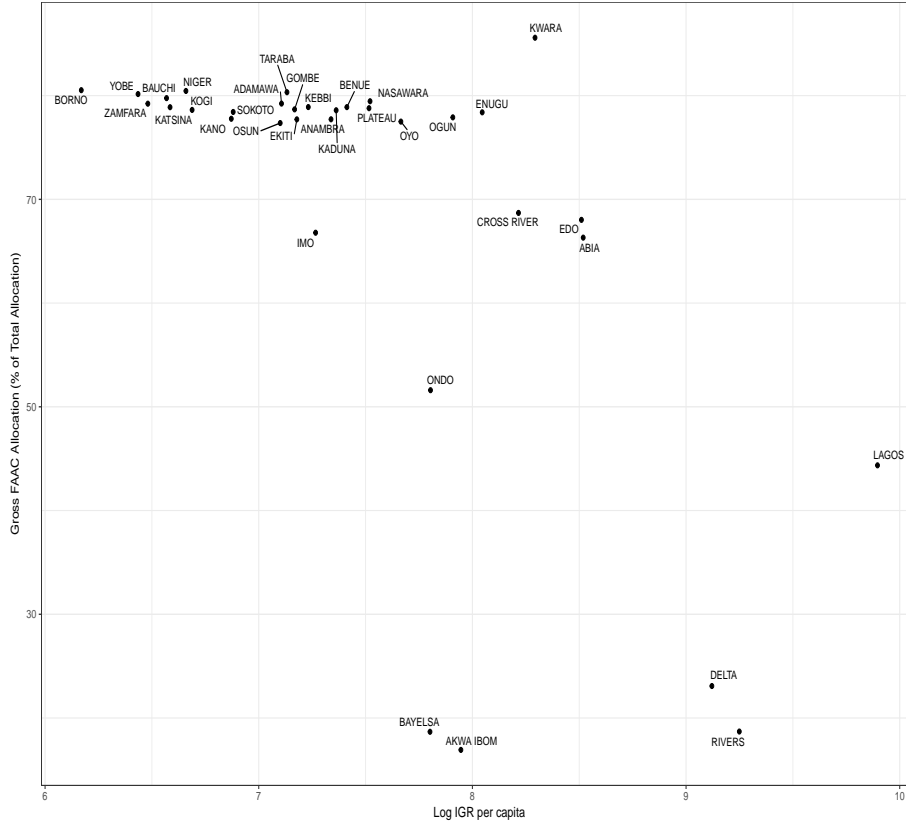
The Total Gross Amount is Gross Allocations plus the Net Share of (Oil) Derivation,
Distribution from the Excess Crude Account and the Value Added Tax (VAT) Allocation.
Jigawa and Ebonyi did not submit totals in 2012 and were dropped. Figures for IGR,
allocations and population in 2012 were obtained from the National Bureau of Statistics.

of allocations. Beyond collection costs, allocations are preferable because sub-national governments do not internalize the cost of funding transfers (Aragon, 2013). There is also a substantial literature addressing the design of transfers as a determinant of incentives subnational units face. Here it is argued that when transfers are properly designed, they reduce incentives to use allocations in self-serving means (Bird & Smart, 2002). The political settlements literature notes that tax regimes in developing contexts reflect rent allocations meant to stably distribute power between elites; typically tax collection becomes more difficult when it substantially reduces elite income. The bargain manifests in toleration for high levels of tax avoidance and evasion (DiJohn, 2010). In terms of the microfoundations linking taxation and accountability, it has been proposed that rather than tapping into loss aversion, taxation signals government capacity to
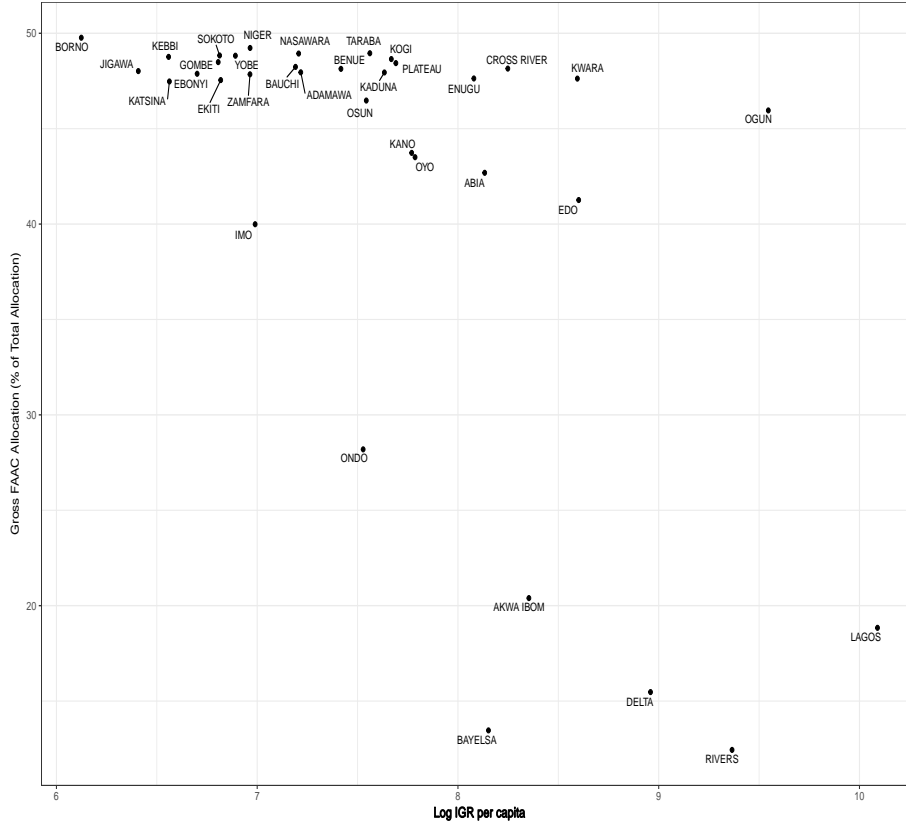
Figure 5: Lagos and Oil-Rich States Collected More IGR per Capita in 2016

The Total Gross Amount is Gross Allocations plus the Net Share of (Oil) Derivation, Distribution from the Excess Crude Account and the Value Added Tax (VAT) Allocation. Figures for IGR, allocations and population in 2016 were obtained from the National Bureau of Statistics

citizens; this is the driver for increased scrutiny/political participation (Weigel, 2018).

The political resource curse literature posits systematic differences in the behavior of (national) governments that are fiscally reliant on broad based taxation and those with access to resource rents, especially oil revenues.[13] Nigeria is arguably a good rentier state based on the criteria suggested by Beblawi (1987).[14] In such a state, rents: (1) heavily influence economic conditions, (2) are paid by external actors, and (3) are generated and owned by a few, of which

[13]This literature stems from the earlier rentier state literature, whose focus has traditionally been Middle Eastern state dynamics. The political resource curse literature tends to look at a broader scope of countries for more generalizable insights. See Ross (2015) for an excellent review. The political curse literature also looks at aid as a form of rent.

[14]The notion of rent was selected to relay a sense of discontent with the amount of effort

the government constitutes the majority (Beblawi, 1987). On the first point, the Nigerian economy is highly vulnerable to oil volatility. In 2013, while oil formed 11 percent of GDP, it made up over 95 percent of exports and 75 percent of government revenue. The oil price decline which started in 2014 led GDP growth to not only dip from its 20-year average of 7 percent in 2015, but to become negative in 2016 (IMF, 2017). Oil constituting 95 percent of exports satisfies the second condition. Finally, the government is the primary recipient and distributor of oil rents; it receives 48.5 percent of petroleum earnings directly and shares the rest with subnational units (IMF, 2017).

As argued in Diaz-Roseco (2016) and Gervasoni (2010; 2018), the political resource curse may also explain behavior of subnational governments who are reliant on allocations. To the extent that these transfers are large and relatively inelastic to performance, they represent rents. Nigerian states can thus be thought of as subnational rentier units since they are reliant on allocations and the allocation formula guarantees a fairly constant share of national income. Considering Nigeria's position as an oil producing state and the possibility to apply rentier hypotheses to subnational units, this paper primarily employs a political curse framework to analyze subnational taxation and spending.

The taxation effect hypothesis suggests that states will reduce taxation to discourage scrutiny when allocations are sufficient (Ross, 2001). On the one hand, leaders are compelled to create social contracts with their citizens to gain the compliance necessary for taxation, such taxation incites citizens into greater scrutiny of the government on the other. Since scrutiny can expose government misdemeanor and damage reelection prospects, taxation is costly.[15] When governments can bypass the creation of this social contract through access to allocations, they respond to incentives that are detached from public wellbeing and are able to purchase support from key constituencies where necessary (Paler, 2013). Direct taxes are thought to be most effective in inducing citizen 'voice' (DiJohn, 2010), perhaps because indirect taxes are included in the prices of goods and are thus "hidden" and may be systematically underestimated by the electorate compared to direct taxes (Sausgruber and Tyran, 2005). Thus, the taxation effect should be stronger in direct taxes. I expect that when Nigerian states receive substantial allocations they expend less effort in collecting taxes within their jurisdictions.

H1: *IGR will drop in response to an allocation windfall.*

The spending hypothesis asserts that a subnational rentier state's focus is the distribution of rents, usually via clientelistic networks, a substantial amount of which goes to patronage. These show up in state spending patterns as provision of public goods and employment. Such spending is aimed at inducing citizen docility; citizens economically dependent on the state are more politically acquiescent (Benli Altunisik, 2014; Ross, 2001; Gervasoni, 2010). Public investment

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invested in how oil-rich states acquired their funds. In other words, income would fall higher in the hierarchy of acquisitional effort than rents, the mere "reward for ownership of. . . natural resources" (Beblawi, 1987, pg. 383).

[15] Here the cost is to the politician, rather than administrative/compliance costs to the bureaucrat, as in Aragon (2013).

is budgeted as capital expenditure, which is thus expected to increase with an allocation windfall. Employment shows up in the staffing and remuneration of MDAs, which falls under recurrent expenditure in state budgets; with an increase in allocations such expenditure should go up.

H2: *An allocation windfall will cause both recurrent and capital expenditure to increase.*

What would happen if states were to receive substantial IGR? With an increase of IGR in the budget, the government would have an incentive to be better behaved since scrutiny will go up. An IGR increase would also represent enhanced fiscal autonomy. This would mitigate the so-called *governance-trap* (a situation where politicians and the electorate blame subnational fiscal woes on the center), further strengthening the incentive to spend prudently (Asatryan, Feld, & Geys, 2015). One consideration is that a switch to majority-IGR funding may simply represent a change in the primary pathways of clientelist networks. Since the size of the budget is positively associated with tax revenues, governments may have an incentive to favor those who are most profitable since their activities maximize their tax receipts. Recipients of favorable policies are thus set by the legislature via tax rates (Gordon & Wilson, 1999). However, since a broader tax base could mean lowered tax rates and a more even playing field, even those receiving targeted benefits may lobby for a broader tax base (Prichard, 2009). Thus, taxation may involve an inherent incentive to broaden the base, however weak. Recurrent expenditure is likely to go down since increased scrutiny reduces incentives to sustain a bloated public service. Recall that employment and remuneration are increased as a means of sharing rents. Capital expenditure (public investment) is expected to go up, in response to increased scrutiny and less room for blame-shifting.

H3: *An increase in IGR will increase capital expenditure and decrease recurrent expenditure.*

4   Data and Methodology

The sample includes annual observations from 1961 to 2016. The variables studied are: allocations (gross statutory allocations as a percentage of total state revenue), IGR (percentage of total state revenue), recurrent expenditure (of total state expenditure), capital expenditure (of total state expenditure). These measures take account of the importance of each variable in the budget, a norm in the taxation effect literature (Diaz-Rioseco, 2016). While the budget is set annually, FAAC allocates revenues monthly, and IGR revenues are recorded quarterly, but 2010 is the earliest these variables began to be recorded at these frequencies. Furthermore, state expenditures are only reported annually. The lower-frequency observations employed may not capture the dynamics as richly as higher-frequency variables, but such data are unavailable. These variables are gotten from the 2011 and 2016 Central Bank of Nigeria (CBN) statistical bulletins and are in millions of Nigerian naira. I include the annual growth rate of GDP per capita, obtained from the World Development Indicators (WDI),

to capture whether government revenues respond to changes in output dynamics (Tijerina-Guajardo & Pagan, 2003), and to control for increases in citizen income.

Importantly, the data are aggregated for all states across all variables. This is a limitation because it means my unit of analysis is a structure that does not exist meaningfully in policymaking (save in state-center negotiations). It is likely that such aggregation also masks heterogeneity in state dynamics; for the same reason it is also difficult to account for outliers. One particularly glaring outlier is Lagos, which singularly contributes a majority of IGR in years which disaggregated data is available (2010-2018), and likely did so well into the past. If the hypotheses above hold, it is likely that Lagos is also an outlier in state-society relations; in 2012, allocations formed 8.6 percent of its PAYE collection alone.[16] Indeed, Elemo (2012) found that Lagos outperforms other (selected) Nigerian states on all indices of state legislature responsiveness.[17]

The data lends itself to a time-series estimation. Time series analysis is also adequate for theoretical reasons, considering that the political resource curse describes "a dynamic process purported to unfold over time... [so that] it is best to employ evidence and methods designed to see whether that time series process actually occurred" (Haber & Menaldo, 2011, pg. 2). I estimate a multivariate recursive Vector Autoregression. A VAR is an n-equation, n-variable generalized autoregression (AR), which takes each variable and explains it by its own lagged values and past values of the remaining variables in the system (Stock & Watson, 2001). VARs assume endogeneity between all variables, that is, all variables influence each other. Lag length is selected by comparing results from Schwartz Criterion (SC), Hannan-Quinn Criterion (HQ) and Akaike's Final Prediction Error Criterion (FPE). They all select a VAR (1), which is in line with practitioners' rule of thumb for annual data.

The reduced form VAR is specified as follows:

$$X_t = \mu_0 + A(L)X_{t-1} + u_t \tag{1}$$

where μ_0 is a constant, $A(L)$ is a first order lag polynomial, X_t is a k-dimensional vector of endogenous variables, and u_t is a k-dimensional vector of reduced form innovations, assumed to be vector white noise. I also include an election dummy (0 for no election, 1 for an election year and the year preceding).[18]

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[16]Lagos collected N172,435,519,871.65 in PAYE and received N3,220,338,357.04 in allocations in 2012.

[17]Including (self-reported) measures of: how effective state legislature represents constituents and women respectively; how much time legislators devote to constituency work, how important legislators think constituency work is, how much weight constituents' views are given in decision making, how willing legislators are to oppose party members when constituents' preferences differ with the party position, and how strongly legislators feel about a legislator losing her job if she is found ignoring constituents. Other states were Katsina, Ekiti, Kano, Oyo, Sokoto.

[18]Elections in Nigeria tend to be held early in the year, so I expect politicians to start lowering IGR collection in the preceding year. In 1999, the elections were held in February; elections were held in April from 2003 to 2011, in March in 2015. I refer to elections and the

The endogenous variables are correlated, so the reduced-form innovations are correlated across equations. I thus convert equation (1) into its structural form by pre-multiplying it with the kxk matrix A_0. This matrix houses the contemporaneous relationships between endogenous variables. $Be_t = A_0 u_t$ describes the relationship between structural shocks e_t and reduced-form innovations u_t.

The structural form VAR is specified as follows:

$$A_0 X_t = A_0 \mu_0 + A_0 A(L) X_{t-1} + Be_t \tag{2}$$

I use the recursive method to identify the model; thus, u_t is made orthogonal via a Cholesky factorization. This implies a causal ordering of variables applied to A_0, i.e. the first variable does not react contemporaneously to shocks to others in the system; the second variable reacts to the first, but not others, and so on. The B matrix is an identity matrix. There are $k!$ possible orderings in total. For the baseline model, assuming that expenditures are set at the start of the year and their actual evolutions do not deviate significantly from expectations, while allocations and IGR continue to be updated as they are shared each month, I order recurrent and capital expenditure first. I place allocations before IGR. Allocations are distributed at the beginning of each month, while IGR collected is totalled at the end of each month. Furthermore, while allocations should respond to IGR as per the formula, a key assumption tested here is that increased allocations reduce IGR effort, dampening the first effect. GDP comes last as Nigeria does not use automatic stabilizers. There is no theoretical basis for putting one type of expenditure before another, so I estimate an alternate VAR with capital expenditure before recurrent expenditure.

Results from a VAR estimation are interpreted graphically using impulse response functions (IRFs). They illustrate responses of endogenous variables to a one standard deviation increase in one of the VAR-equation shocks holding other shocks constant. Since past values have been accounted for, errors are referred to as shocks as they represent unexpected movements in the variable (Stock and Watson, 2001).

5   Estimation and Results

I test for stationarity using the Augmented Dickey Fuller, Phillips Perron, Kwiatkowski-Phillips-Schmidt-Shin and Zivot-Andrews unit root tests. GDP per capita growth rate is stationary at levels. All other variables are detrended using a one-sided Hodrick-Prescott Filter.[19] The VAR (1) is estimated using OLS.[20] I apply an asymptotic Portmanteau Test for autocorrelation in the residuals. With a p-value of 0.8343, the null-hypothesis of no autocorrelation cannot

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year preceding as election period.

[19]Lambda set to 6.25. The VAR is highly parameterized ($k + pk^2$ coefficients), so I use the HP filter to maximize the number of observations (as opposed to differencing).

[20]Farzanegan and Markwadt (2009) and Farzanegan (2011) note that even in the presence of cointegration amongst I (1) variables, unrestricted VARs perform better in forecasting than Vector Error Correction Models. The norm is however to use the latter. I explore the possibility of cointegration later in this thesis.

be rejected. The Breusch-Godfrey test also suggests no autocorrelation in the residuals with a p-value of 0.1448. The roots of the characteristic polynomial lie within the unit circle, so the VAR process is stable.[21] Impulse responses are presented in the Appendix. 95 percent confidence intervals are generated by bootstrapping, repeated 500 times.

IGR responds negatively to an unexpected increase in allocations (see Figure 7). The initial impact is significant; the response decays quickly to the base-line. The finding aligns with that of Gervasoni (2010) who found a significant negative effect of federal allocations on internal revenue generation in Argentine provinces. Benin and Mogues (2012) found that transfers depress both IGR level and growth rate in Ghanaian districts. However, Masaki (2018) found that in Tanzanian local governments where both collection capacity and the political costs of collecting taxes are low, transfers facilitate internal revenue generation. Local government taxes tend to be smaller scale fees than those of state governments; while Nigerian states may not have a high collection capacity, it is not evident that political costs of tax collection are low. The response is robust to placing capital expenditure before recurrent expenditure in the causal ordering (see Figure 10).

Recurrent expenditure has a fast decaying negative response to a one standard deviation IGR shock. The response is insignificant. Capital expenditure has a fast decaying positive response to an unexpected increase in IGR. The response is insignificant (see Figure 8). Hoffman and Gibson (2005) found that an increase in the amount of taxes constituents pay is positively associated with the amount of IGR local governments in Zambia and Tanzania devote to public service expenditure. Gadenne (2017) found that increases in tax revenues led to increased spending on education infrastructure in Brazil. While the response directions for capital and recurrent expenditure are in line with theoretical expectations, they could be driven by Lagos' fiscal policy. Lagos' IGR has constituted a large amount of total IGR collected in the last decade at least; the state is IGR-reliant and spends more on capital than recurrent expenses.[22]

Recurrent and capital expenditures' responses to an allocation shock are largely indeterminate. They both do not deviate much from their baselines and are insignificant (see Figure 7). These responses do not align with the spending hypothesis, which suggest that both recurrent and capital expenditure should go up. It appears that the spending effect does not hold in Nigeria. This could reflect the preference for more direct distribution of rents, which may not show up at the level of aggregation under study. It could also be a function of population size; at nearly 200 million, setting up a distributive state is more difficult than in Middle-Eastern countries where the spending effect was first hypothesized. Smaller sized states may show such an effect according to this line of logic, and this is something that further research can clarify. In any case, the finding is in line with McGuirk (2013) who did not find a spending effect on

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[21]Roots are 0.2569, 0.2569, 0.1583, 0.1583, 0.1402.

[22]For example, approximately 66 percent of Lagos' 2018 budget was apportioned for capital expenditure (BudgIT, 2018).

a cross section of 15 African countries, including Nigeria.[23]

5.1 In Search of a Transmission Mechanism for the Taxation Effect

The result above provides support for the first part of the taxation effect hypothesis: an increase in allocation reduces IGR collected. The second part, suggesting that politicians reduce taxation to discourage scrutiny, remains to be shown. The norm in the literature is to use experimental methods to test that taxation increases citizens' willingness to scrutinize and/or punish leaders (for example, Paler, 2013; Martin, 2016; Armand, Isabel Costa, Coutts, Vicente, & Vilela, 2018; Hoem Sjursen, 2018). An exception is McGuirk (2013) who used instrumental variable regression on a cross-country representative household survey sample of sub-Saharan African countries. He tested for the effect of resource rents on respondents' perceptions of tax enforcement stringency and demands for accountability. He found that increases in resource rents reduce perceived tax enforcement and increases in perceived tax enforcement increase the demand for accountability. He also found that the effect of rents on perceived tax enforcement strengthens towards (national) elections.

This idea has its basis in the political business cycle literature. This literature however offers opposing predictions for the movement of direct taxes prior to elections (the theory is agnostic to a country's oil production status). It considers that the median voter in a developing country holds less capital than the average capital stock, and that most citizens work in the informal sector. Thus, voters bear a larger burden of consumption tax *vis a vis* capital gains tax, and only a few pay income tax. The model suggests that citizens in developing countries will accordingly prefer lower indirect taxes to lower direct taxes. A self-interested ("desk") policymaker prefers high indirect taxes during non-election periods to provide firms with low company income tax but lowers indirect tax as elections near, to increase chances of reelection. To meet the intertemporal budget constraint, the policymaker will also increase direct taxes towards elections (Ehrhart, 2013).

Since McGuirk was able to directly test for the link between accountability and tax enforcement, the notion of the taxation effect ramping up towards elections featured as an ancillary test; here I test for its presence as a proxy-if present, it suggests that leaders perceive this link between tax and demands for accountability/increased scrutiny and try to avoid triggering it. The inter-

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[23]When I estimate the IRF with 68 percent confidence intervals, capital expenditure goes up slightly, while recurrent expenditure goes down slightly (result not shown). Perhaps Nigerian states behave like oil-rich Brazilian municipalities described by Caselli and Michaels (2013). They found that oil transfers led to increased public investment, but without proportionate increases in citizen quality of life. In my model, GDP per capita's response to a capital expenditure shock is negative and insignificant (in Appendix). Caselli and Michaels labeled the gap between spending and outcomes as "missing money" and presented evidence that funds were being diverted to patronage and embezzlement. I am aware that this hypothesis does not necessarily follow from the results; showing convincingly that there is a case of missing money diverted corruptly in Nigeria is beyond the scope of this paper.

pretation of an increase in IGR collection is not as straightforward: in Nigeria, indirect taxes are collected at the national level. This reduces the likelihood that an increase in IGR collection (if obtained) occurs as a counterbalance to reduced indirect taxation. The possibility that the Federal Government is colluding with state governments to offset reduced indirect taxes is also low because state governments do not remit IGR to the center.

To test for this "ramping up" effect in Nigeria, I employ an Autoregressive Distributed Lag (ARDL) to the unfiltered data. The Augmented Dickey Fuller, Phillips Perron, Kwiatkowski-Phillips-Schmidt-Shin and Zivot-Andrews unit root tests reveal that the data are integrated of different orders (I (0) and I (1)), with some disagreement on whether variables are stationary at levels at the 0.05 significance level (see Table 1). ARDL is useful in a case like this, as it allows for different orders of integration.

Variable	ADF	KPSS	PP	ZA
Allocation	-2.9	0.15*	-3.8*	-4.52*
$\Delta Allocation$	-5.3*	0.031*	-9.9*	-9.9*
IGR	-3.2	0.12	-3.5*	-4.17
ΔIGR	-6*	0.043*	-8.8*	-8.46*
recurrent expenditure	-2.7	0.077*	-3.1	-3.46
$\Delta recurrent expenditure$	-6.3*	0.051*	-8.5*	-8.65*
capital expenditure	-2.7	0.086	-3.2*	-3.6
$\Delta capital expenditure$	-5.8*	0.045*	-8.6*	-8.75*
GDP per capita (growth rate)	-4.8*	0.098*	-5.2*	-5.46*

Table 1: Test Statistics for Stationarity Tests.

*Note: * denotes stationarity*

I use the unrestricted Error Correction Model transformation of the ARDL (hence many terms are in growth rates), to facilitate cointegration testing (Giles, 2013). This works for my purposes because it is likely that variables such as GDP per capita growth rate, inflation and urbanization are not as relevant for the growth rate of IGR (than they would be for the level) (Mogues & Benin, 2012), enabling me to focus on state public finance variables.

A visual inspection of the IGR variable indicates the presence of structural breaks. The Bai and Perron (2003) method for endogenously detecting multiple structural breaks detects two breaks, in 1976 and 1984. These dates are significant in Nigerian history: 1976 saw an extensive decentralization where 301 local governments were created with powers to raise revenues within their constituencies. Furthermore, 10 percent of the nation's revenue was earmarked as local government allocations (Olowu, 1986). In 1984 Nigeria was subjected to a coup d'etat of a civilian government; it was also in the throes of the 1980s

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oil glut.[24] I thus construct a dummy variable for 1976 and 1984 respectively. I test for serial correlation in the residuals using the Durbin-Watson test. With a p-value of 0.75, I cannot reject the null hypothesis of no autocorrelation in the model residual.

The results (2 and 3) show that during nonelection years, the change in allocations is associated with a 0.339 percentage point decrease in the IGR growth rate, consistent with the taxation effect hypothesis. During elections, the effect intensifies to a 0.619 percentage point decrease, suggesting that "as rents increase, the rational leader disengages his citizenry by lowering [personal income] tax enforcement" (McGuirk, 2013, pg. 309).[25] I also run the unrestricted ECM including the lags of recurrent and capital expenditure. This is also a test of the "spend-tax" hypothesis, which suggests that governments use taxes to smooth consumption and meet the intertemporal budget constraint (Carneiro, 2007). Both put significant upward pressure on IGR growth rate; the taxation effect and intensification during elections remain. However, this effect is *not* robust, when I run the cointegration model 3 Model (4) the directions are the same, but effect size is a lot smaller and insignificant.

5.2 Cointegration Testing

One advantage of having a long time series is I can check for the presence of a long run cointegration relationship between variables of interest.[26] This is done through a Bounds test, using critical values from Pesaran et al. (2001). Since the taxation hypothesis is significant in my model I perform a Wald test on the coefficients of IGR_{t-1} and $allocations_{t-1}$, testing if the coefficients are zero in Figure 2 Model (1). The F-statistic is 6.4, with k=4. The figures for a 99 percent level of significance with an unconstrained intercept and no trend line are lower bound: 3.74, upper bound: 5.06. The F-statistic is greater than the upper bound, suggesting the two time series have a cointegrating relationship at the 99 percent level of significance. This implies that a linear combination of the levels of allocations and IGR is stationary and represents the long run relationship between the variables. I thus regress IGR on allocations (Figure 3 Model (3)). In the long run, an increase in allocations leads to a 0.22 percentage point decrease in IGR. The residuals from this model then enter a restricted ECM (Figure 3 Model (4)), as z_{t-1}. The coefficient is negative and significant (as expected when a cointegrating relationship exists). It implies a slow adjustment: in a year, a disequilibrium in the long run relationship is corrected by 0.395 percentage points.

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[24]It is called the 1983 coup, but it occurred on December 31st, 1983. Thus, it substantively unfolded in 1984.

[25]While the interaction is not significant, I argue that with a coefficient around half of the isolated effect of allocations on IGR and a significant combined conditional coefficient, the result is worth interpreting.

[26]This section draws heavily from Giles (2013).

Table 2: Interaction Results

	Dependent variable:	
	ΔIGR_t	
	(1)	(2)
IGR_{t-1}	−0.418***	−0.530***
	(0.119)	(0.136)
allocations$_{t-1}$	−0.145	−0.200*
	(0.098)	(0.105)
Recurrent Expenditure$_{t-1}$		0.605**
		(0.298)
Capital Expenditure$_{t-1}$		0.525*
		(0.312)
$\Delta allocations_t$	−0.351***	−0.365***
	(0.124)	(0.124)
Election Period	−0.928	−1.309
	(1.992)	(1.951)
1976 Dummy	−10.044***	−9.143**
	(3.350)	(4.143)
1984 Dummy	3.742	3.247
	(2.983)	(3.804)
$\Delta allocations_t * ElectionPeriod$	−0.266	−0.248
	(0.185)	(0.181)
Constant	23.415**	−27.549
	(8.957)	(29.498)
Observations	54	54
R^2	0.575	0.613
Adjusted R^2	0.510	0.534
Residual Std. Error	6.162 (df = 46)	6.011 (df = 44)
F Statistic	8.888*** (df = 7; 46)	7.749*** (df = 9; 44)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3: Long Run Cointegration

	Dependent variable:	
	IGR$_t$	ΔIGR_t
	(3)	(4)
allocations$_t$	−0.220**	
	(0.109)	
z_{t-1}		−0.395***
		(0.122)
$\Delta allocations_t$		−0.417***
		(0.114)
Election Period		0.222
		(1.983)
1976 Dummy		−10.464***
		(3.310)
1984 Dummy		4.614*
		(2.585)
$\Delta allocations_t * ElectionPeriod$		−0.036
		(0.208)
Constant	34.730***	4.737**
	(7.383)	(2.188)
Observations	56	55
R^2	0.070	0.554
Adjusted R^2	0.053	0.498
Residual Std. Error	10.099 (df = 54)	6.201 (df = 48)
F Statistic	4.048** (df = 1; 54)	9.932*** (df = 6; 48)
Note:		*p<0.1; **p<0.05; ***p<0.01

Figure 6: Marginal Effects of Allocation on IGR by Election Period
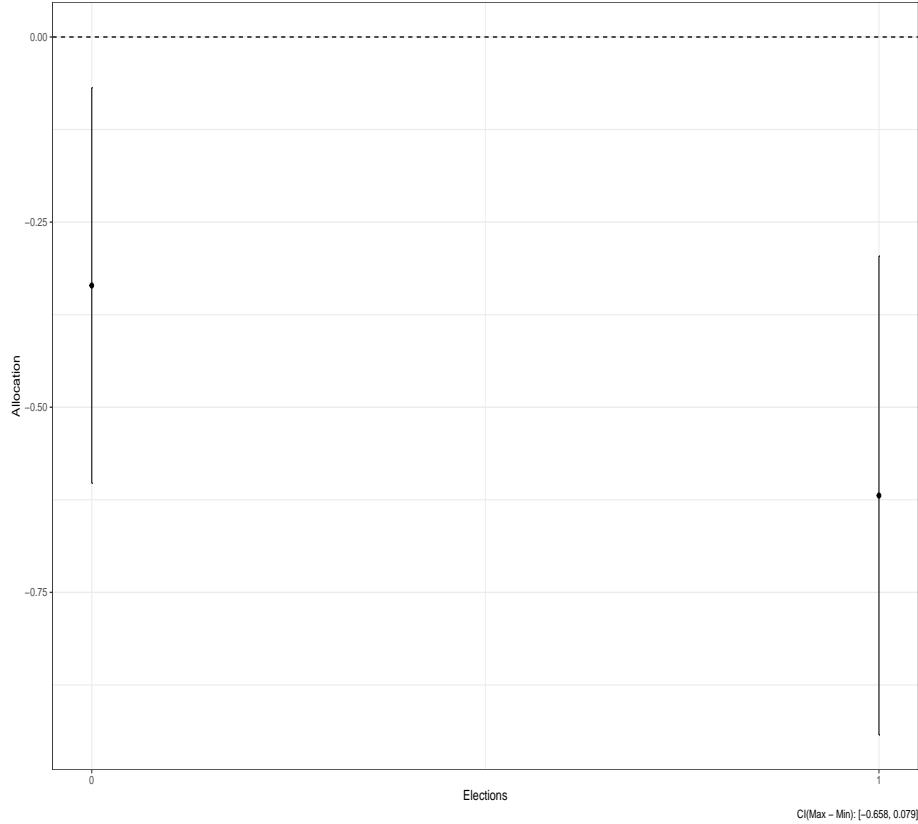
This figure shows the conditional coefficient of allocations on IGR during elections (=1) and non-election periods (=0), including 95 percent confidence intervals around point estimates. The standard errors for the conditional coefficients are calculated using Esarey and Sumner (2017).

6 Limitations and Conclusion

6.1 Limitations

Unavailability of disaggregated data significantly limited the study. IGR and recurrent expenditure are composite measures that may not adequately proxy taxation and employment/remuneration. Considering that taxation and employment are themselves proxies for governance, I consider these results tentative evidence at best. Furthermore, states are de facto treated as equivalent whether or not they receive oil derivations. Rentier state literature typically treats oil-rich units differently from allocation reliant states based on differences in their ability to extract income in their jurisdictions, and their overall

fiscal independence from the center (Diaz-Rioseco, 2016). While Nigerian states are all able to extract income locally, Figures 4 and 5 suggest that there may be a positive relationship between receiving oil derivations and IGR. The states for which allocations did not contribute up to 60 percent of total allocations in 2012 and 30 percent in 2016 received substantial amounts of oil derivation funds, except Lagos which did not become an oil producing state until 2017. It instead received substantial VAT allocations. This data also suggests that oil rich states may collect more IGR than their non-oil counterparts. Even states for which derivation funds are not as hefty, such as Edo, Abia and Cross-River tend to be in the upper range of IGR per capita generation. The literature tends to focus on a spending effect for such states (Gervasoni, 2010). Anecdotal evidence suggests that some oil-rich states have been better able to pay salaries in the wake of the oil-price crash; it is however not clear whether that is a function of a distributive regime, as some oil-states are better positioned than others.[27] The data is also aggregated at an awkward level; the entire state corpus is not a body that exists meaningfully in many policymaking scenarios. With these limitations, it is difficult to generalize to both studies on the national level since they study Federal Government actions and subnational studies that explore individual and multiple state dynamics. I would have also liked to test on different time periods to see whether the results hold over different political eras, considering, for example, that "[post]-independence (1960 – 1999), Nigeria's military leadership repeatedly curtailed subnational entities' power to tax." (Elemo, 2012, pg. 4).

Lack of data also prevents responding more convincingly to alternative or conflicting explanations. One such argument is that payroll size/employee remuneration may well measure a government's willingness to improve service delivery, as providing adequate resources is necessary for service delivery. Indeed, this argument has been made in the context of Lagos' development. The provision of resources was instrumental in the reform of Lagos tax administration and resulted in significantly improved tax collection. Specifically, the change from the Lagos revenue board to the Lagos Inland Revenue Service came with greater autonomy, including the ability to attract higher quality staff through better pay (de Gramont, 2015). As it is, I am left to piggybacking the results of others in responding to this argument. Gervasoni (2010) found that the size of the Argentine public payroll is a positive function of federal allocations and resource rents. He also found that economic development is negatively associated with the size of the payroll (while controlling for population, federal transfers and resource rents). An adequate response to this argument would be to also regress economic development on the size of the payroll (for all states). However, specifically in the Lagos case, the tax reform occurred partly because

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[27]One sign of state ability to pay is their offering to help: other states, as in Rivers (Azubuike, 2018) and local governments, such as Delta (Ngwodo, 2018), Edo (Ebegbulem, 2018); or paying early, as in Cross River (Odunsi, 2017). The share of remunerations in revenue allocations is also telling; in Ondo state remunerations can account for 90 percent of allocations (Akure, 2018; Ojo, 2018). However, states like Bayelsa (Willie, 2018) and Akwa-Ibom (Ukpong, 2018) have at some point struggled to pay.

of a rift with the FG which involved cutting off allocations for Lagos' local governments in 2004 (de Gramont, 2015). Thus, a decrease in federal allocations contributed to increased spending on tax administration and eventually increased tax collection- consistent with the rentier model. So, in deciding between conflicting arguments, context-which I have not been able to provide-is important.

6.2   Conclusion

In this study I argue that Nigerian states' interest in ECA revenue (to the detriment of national macroeconomic goals) is driven by a fiscal devolution stalled by a strong allocation reliance. This allocation reliance is enabled by abundant oil revenues and the nature of the allocation formula, which allows for a fairly constant share of total revenues to be allocated to each state. Allocations allow states to exist in a grey area of accountability, where they are neither fully bound to the center or the people. The political resource curse theory provides predictions for how such states should behave: they should reduce taxation in the presence of allocation revenues, possibly in order to reduce scrutiny of their government, and increase spending to make citizens politically indifferent. In the literature also lies a silver lining: if taxes increase, increased scrutiny means that states may spend more on economic development.

I model Nigerian state revenues and expenditures with a recursive Vector Autoregression to determine whether states operate in line with these predictions. I find that IGR declines with an allocation shock, and that IGR shocks lead capital and recurrent expenditure to increase and decrease respectively, although the latter result is insignificant. I also find that government expenditure does not respond significantly to an allocation shock; the impulse responses are largely indeterminate, suggesting the spending hypothesis is not applicable in the Nigerian context. I find that in election years the tax effect strengthens; this may suggest that governments reduce taxation to discourage scrutiny. However, the result is not robust. Finally, I find evidence of a negative long run cointegrating relationship between allocations and IGR. Overall, the strongest evidence in my findings is for the first link of the taxation hypothesis: when states receive sufficient external funding, they are less likely to tax citizens. The findings however suffer from significant data-induced limitations.

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8 Appendix

8.1 Tables

Table 4: Descriptive Statistics

	IGR	Allocations	Recurrent Expenditure	Capital Expenditure	GDP pc growth
Minimum	0.8777	37.59	37.06	15.97	-0.3340191
Median	20.2922	67.90	60.33	41.79	0.0065205
Mean	20.1247	66.40	60.50	51.80	-0.0006948
Maximum	42.4317	96.81	87.30	146.20	0.2199304
Standard Deviation	10.37539	12.45572	11.52795	29.50611	8.109317

Table 5: Correlation Matrix

	IGR	Allocations	Recurrent Expenditure	Capital Expenditure	GDP pc growth
IGR	1.0000000				
Allocations	-0.2640842	1.0000000			
Recurrent Expenditure	0.62234961	-0.05344975	1.0000000		
Capital Expenditure	-0.4382960	0.33784976	-0.71824102	1.0000000	
GDPpc growth	0.11098175	-0.06239693	0.10949572	-0.29390710	1.0000000

8.2   Impulse Responses

Figure 7: Shock: Allocations Responses: Recurrent, Capital Expenditure and IGR
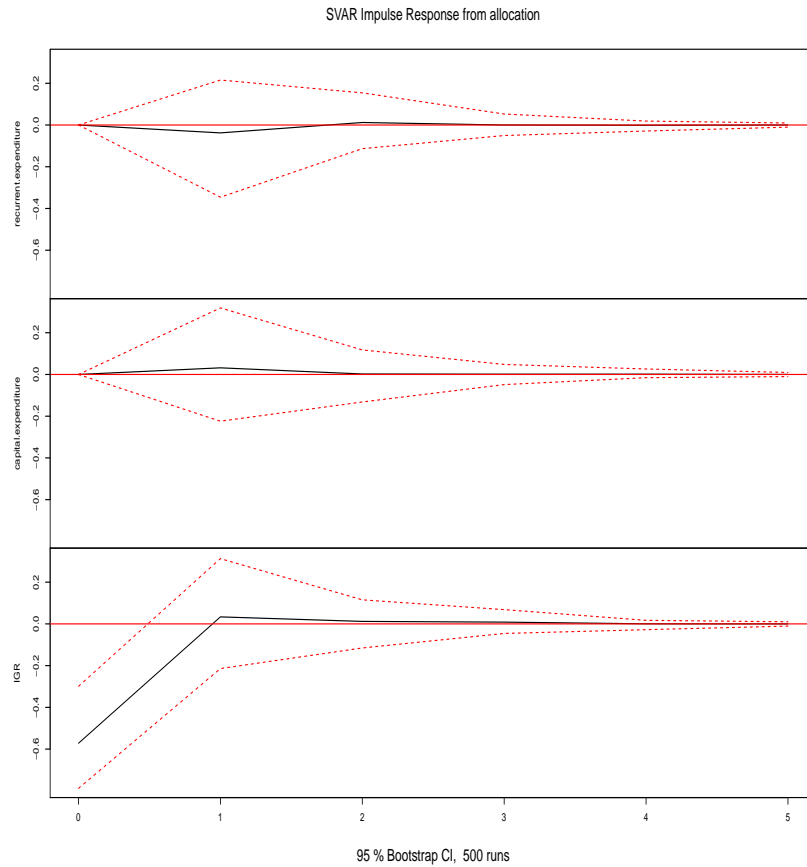

SVAR Impulse Response from allocation

95 % Bootstrap CI, 500 runs

31

Figure 8: Shock: IGR Responses: Recurrent, Capital Expenditure

SVAR Impulse Response from IGR

95 % Bootstrap CI, 500 runs
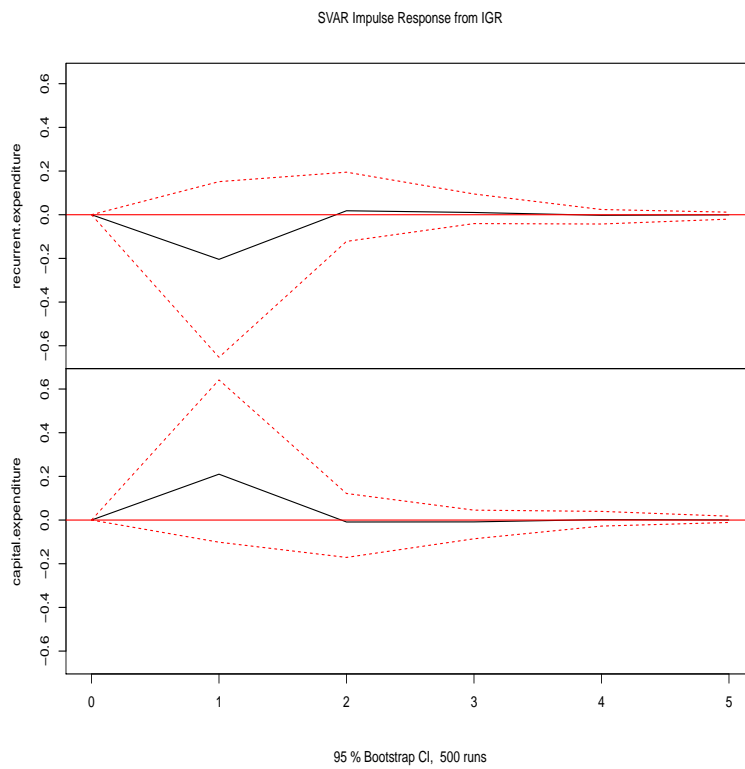
Figure 9: Shock: Capital Expenditure Response: GDP per capita growth

SVAR Impulse Response from capital.expenditure

95 % Bootstrap CI, 500 runs

33
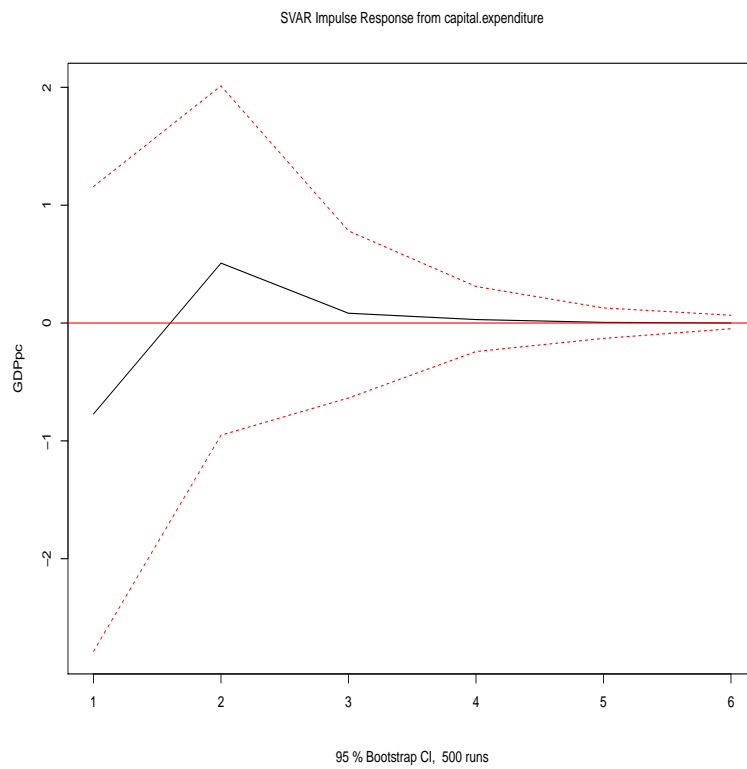
Figure 10: Shock: Allocations Responses: Capital, Recurrent Expenditure and IGR

SVAR Impulse Response from allocations

95 % Bootstrap CI, 500 runs
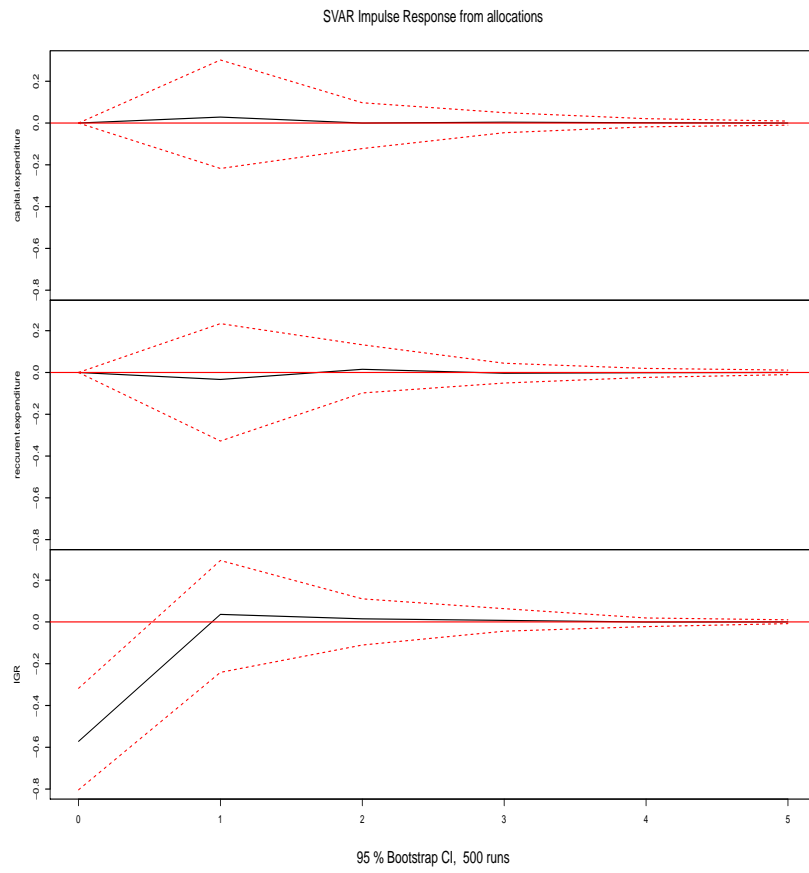
Figure 11: Shock: IGR Responses: Capital, Recurrent Expenditure

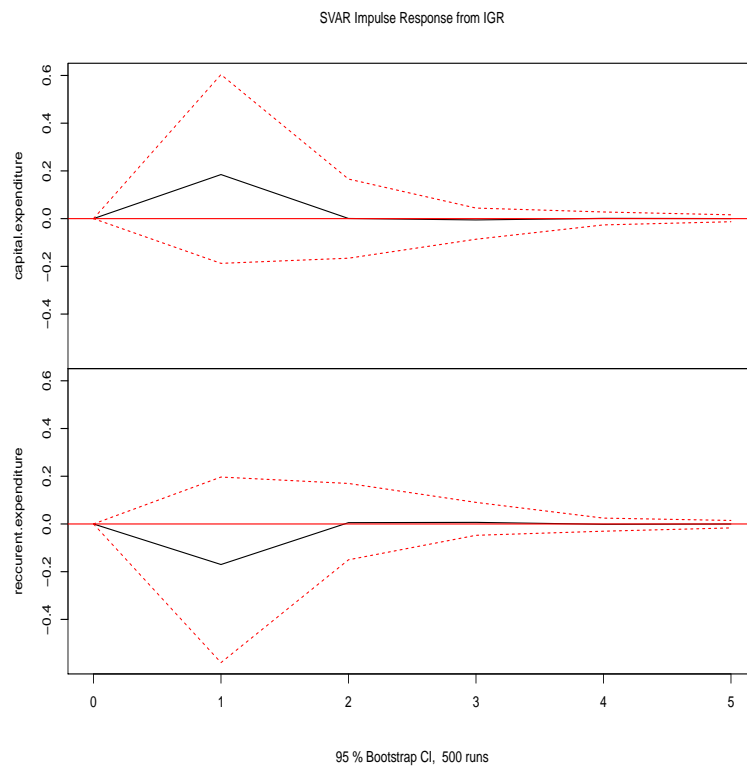SVAR Impulse Response from IGR

95 % Bootstrap CI, 500 runs

35

Figure 12: Shock: Capital Expenditure Response: GDP per capita growth (alternate order)

SVAR Impulse Response from capital.expenditure

95 % Bootstrap CI, 500 runs

36