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# Ownership structure of oil revenues: Political institutions and financial markets in oil-producing countries

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## ABSTRACT

This study examines the impact of the ownership structure of oil revenues on financial markets and institutions, and the intermediating role of political institutions. Using the fixed-effects model and GMM for robustness, we analyse data from 82 oil-producing countries. We find several key results. Firstly, government ownership of oil revenues undermines the efficiency of financial institutions when the quality of political institutions is weak, but enhances their efficiency when political institutions are strong. Secondly, the impact of private ownership of oil revenues is negative on the depth of and access to financial institutions when the quality of political institutions is weak, but positive when political institutions are strong. We observe similar threshold effects for the depth of and access to financial markets in the subsample of developing countries. We conclude that oil-producing countries need solid political institutions to benefit from oil wealth and to boost financial development.

## 1. Introduction

There is a wealth of studies on the drivers of financial development but few of them focus on the link between natural resources, political institutions and financial development (see [Beck et al., 2003](#); [Acemoglu and Johnson, 2005](#); [Bhattacharyya and Hodler, 2014](#); [Dwumfour and Ntow-Gyamfi, 2018](#); [Asif et al., 2020](#)).

These studies examine an important channel through which natural resource wealth may benefit or inhibit the financial development efforts of countries endowed with natural resources. Most of these studies argue that natural resource wealth leads to a financial curse in countries with abundant natural resources (see [Khan et al., 2020](#); [Dogan et al., 2020](#)). This financial curse is attributed to market failures, (James, 2015), weak institutional quality such as property rights, poor contract enforcement left by the colonizers ([Beck et al., 2003](#)) and poor management of oil revenues by the government and private international oil companies ([Mohammed et al., 2020](#)).

This current study explores the ownership structure of oil revenue (government vs. private) investments on financial institutions and markets to explain whether oil revenues can spur or hinder financial institutions and market development in oil-producing countries. In particular, the study explores the channel through which the “ownership structure of oil revenues” could provide

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answers to the financial curse thesis and the intermediating role of political institutions.

In general, studies on financial development and natural resource wealth focus on the aggregate of natural resource revenues and how they promote specific sectors of the financial markets without disaggregating them into private and government ownerships of oil revenues for investments in the domestic economy (see [Bhattacharyya and Hodler, 2014](#); [Dwumfour and Ntow-Gyamfi, 2018](#); [Khan et al., 2020](#); [Dogan et al., 2020](#)). [Dwumfour and Ntow-Gyamfi \(2018\)](#) study the impact of natural resource revenues on banking sector development (credit to the private sector and bank stability) and [Bhattacharyya and Hodler \(2014\)](#) investigate the role of natural resources on the banking sector and stock market development (private credit, Deposit Banks, stock market capitalization and turnover ratio). These studies argue that natural resource revenues have a negative impact on financial markets at the initial stages of the resource revenues but have a positive impact on financial markets when political institutions are intermediated with natural resource revenues.

Quite recently, [Khanna \(2017\)](#) and [Mohammed et al. \(2020\)](#) examine the ownership structure of oil wealth (government and private ownership) on economic growth. However, these studies do not consider how the ownership structure of oil revenue impacts the financial system. In particular, [Khanna \(2017\)](#) proves that where the ownership of oil resources is controlled by the state, oil abundance reduces economic growth when political institutions are poor, and growth increases when the quality of political institutions is enhanced. On the other hand, [Mohammed et al. \(2020\)](#) show that government investment of oil revenues reduces economic growth when domestic financial markets are weak but increases economic growth when financial markets are strong. Their study also find that private investment of oil revenues increases economic growth with weak domestic financial markets, albeit a reduction in economic growth with a developed financial market.

The ownership structure of oil revenue provides a solid foundation under which oil funds could properly be managed. Therefore, disaggregating oil revenues into government and private ownerships for investment tend to foster financial development when political institutions are developed.

The study makes three key contributions to the literature. First, it quantitatively examines the impact of the ownership structure of oil revenues on financial markets and institutions. Previous studies (e.g., [Dogan et al., 2020](#)) focus on oil rent (revenue) as an aggregate oil revenue without separating it into the share of government and private oil revenues for investment in the domestic economy to boost financial development. How do these different investments (government and private sector) impact financialization? Secondly, the study focuses on the heterogeneous impact of government and private investment of oil revenues on different aspects of financial system development (depth, access, and efficiency). Thirdly, it contributes to the literature by taking a comprehensive analysis of the management of oil revenues and its influence on the financial system (both financial markets and institutions) than any prior study. The study also incorporates the role of political institutions in such a comprehensive approach which has not been considered by researchers like [Bhattacharyya and Hodler \(2014\)](#), [Dwumfour and Ntow-Gyamfi \(2018\)](#), [Dogan et al. \(2020\)](#), and [Khan et al. \(2020\)](#).

The study considers the depth, access and efficiency dimensions of the financial system because prior studies focus only on the depth while neglecting access and efficiency of either the banking sector or stock market development. Even though the depth of the banking sector or stock market development is important, access and efficiency make the financial markets and institutions resilient and stable. Therefore, investigating the impacts of investing government and private share of oil revenues on the depth, access and efficiency of financial market and institutions is essential for promoting financial development in oil-producing countries.

The current study utilizes data from 82 oil-producing countries from 1990 to 2015. The study first employs a panel vector autoregressive (PVAR) model to estimate the coefficient of oil rent on government and private investment to compute the variable for the ownership structure of oil revenues. In addition, the fixed effects and two-step GMM models are used to estimate the effect of the ownership structure of oil revenues on financial markets' and institutions' development by intermediating the role of political institutions.

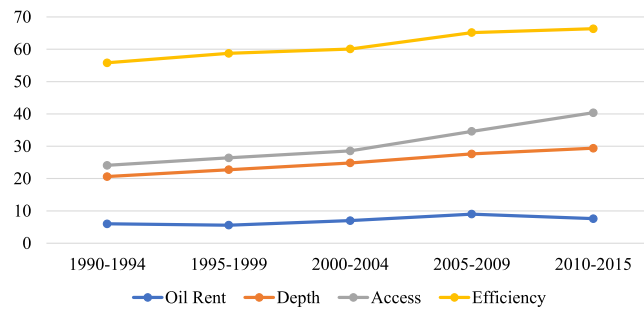
The finding from the study shows that government ownership of oil revenues has a negative influence on financial institutions' efficiency when political institutions are weak and enhances financial institutions' efficiency when the quality of political institutions is strong. Similarly, the study finds that private ownership of oil revenues for investment on financial institutions' depth and access are negative when the quality of political institutions is weak and strengthens when the quality of political institutions gets stronger. Finally, the study finds that private ownership of oil revenue improves with financial markets' depth when political institutions get weaker and reduces financial markets' depth when the political institutions get stronger in the subsample of developing countries.

These findings are distinguishable from the influential studies in the field such as [Bhattacharyya and Hodler \(2014\)](#), [Dwumfour and Ntow-Gyamfi \(2018\)](#), [Dogan et al. \(2020\)](#), and [Khan et al. \(2020\)](#) whose focus was on the aggregate impact of natural resource revenues on financial development. It is also distinct in the sense that it looks at all three dimensions of financial institutions and markets; that is depth, access and efficiency. Previous literature, on the whole, relies solely on the depth of financial institutions. Finally, the findings are unique because it provides very important information on the government and IOCs investment of their share of oil revenues on the financial development of the domestic economy.

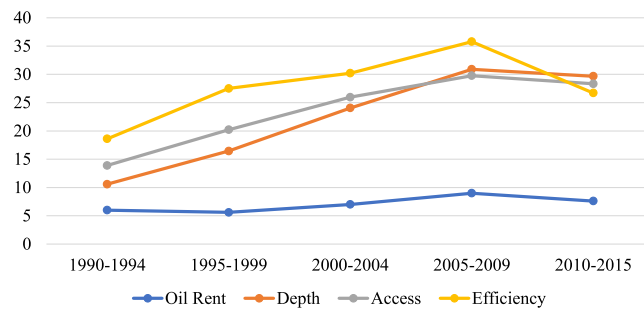
The study is structured as follows: Section 2 provides the stylized facts on oil revenues, finance, and political institutions. The theoretical and empirical discussion of the literature is in section 3. Section 4 gives details of the study methods, which include data sources, variables used, and the empirical specification of the econometric models. Section 5 presents the results and discussion of the findings and section 6 draws the conclusion and policy implications for the study.

### 1.1. Stylized facts on oil revenues, finance, and political institutions

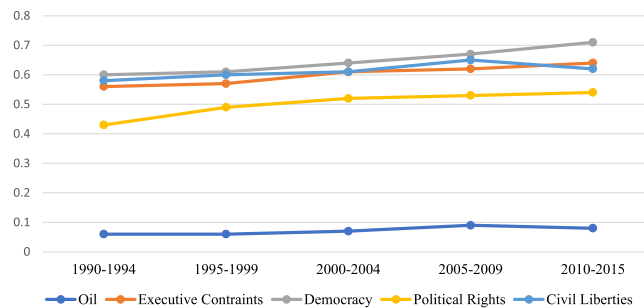
This section discusses oil revenues, financial market development, and political institutions. Data from the period 1990–2015 for all the variables are averaged on a five-year basis. [Fig. 1](#) shows the trends of oil revenues and financial institutions (depth, access, and



**Fig. 1.** Oil Revenues and Financial Institutions. This figure illustrates oil revenues and financial institutions indicators averaged over a five-years period from 1990 to 2015. Oil rent is obtained from world development indicators and financial institutions’ depth, access and efficiency data are obtained from IMF financial development index. The yellow line shows financial institutions’ efficiency, the ash line shows financial institutions’ access, orange line shows financial institutions’ depth while the blue tick line shows oil rent.



**Fig. 2.** Oil Revenues and Financial Markets. This figure shows oil revenues and financial markets indicators averaged over a five-years period from 1990 to 2015. Oil rent is obtained from world development indicators, financial markets depth, access and efficiency data are obtained from IMF financial development index. The yellow line shows financial markets efficiency, the ash line shows financial markets access, the orange line shows financial markets depth and the blue tick line shows oil rent.



**Fig. 3.** Oil Revenues and Political Institutions. This figure shows oil revenues and political institutions averaged over a five-years period from 1990 to 2015. Oil rent is obtained from world development indicators. The executive constraints and democracy variables are obtained from the polity IV database while the political rights and civil liberties are obtained from Freedom House. The thick blue line at the base is the oil rent, the yellow line is political rights, the orange executive constraint, the light blue line is civil liberties and the thick ash line is democracy.

efficiency), Fig. 2 indicates the trends of oil revenues and financial markets (depth, access, and efficiency), while Fig. 3 shows oil revenues and political institutions trends.

Fig. 1 indicates that oil revenues are low in the early 1990 s to late 1990 s with a corresponding low financial institutions development. However, oil revenues improve in the late 2000 s, leading to a corresponding increase in financial institutions’ development. Furthermore, the relationship between oil revenues and financial markets depicts an upward rise in financial market development when oil-rich countries gained slight improvement in their oil revenue mobilization. The increase in the efficiency of the financial markets is higher than depth and access because as oil revenues to international oil companies improve, the IOCs find ways to diversify their portfolio by investing in the stock market and related corporate and government bonds thereby making the financial markets liquid.

Additionally, there was a dip in oil revenues in 2014 due to fluctuations in international oil prices. Again, most oil-rich countries

that rely on oil money to finance their budget have to borrow to finance their budget which caused economic debt traps. This made some of the oil-producing countries resort to issuing more domestic bonds and Eurobonds to finance their budget deficit created by the decline in oil prices. In sub-Saharan Africa for instance, countries that have built stabilization funds (e.g Ghana) withdrew some funds to support their budget.

Fig. 3 indicates that in the early 1990 s an average of 6% of oil revenues as a percentage of GDP was recorded with a corresponding low political institution. With these averages, countries with good institutions could manage the revenues from the oil wealth while countries with bad institutions may not. As time go by, oil revenue improves with institutional equality also improving gradually. Eregha and Mesagan, (2016) argue that where political institutions are weak, there could be rent-seeking behaviour of political actors where contracts signed between IOCs and governments are shrouded in secrecy.

## 1.2. Theoretical and empirical review

### 1.2.1. Theoretical framework

The study hinges on the endowment theory of financial development and capital scarcity and the risk premium theory. Firstly, the endowment theory of financial development is proposed by Beck et al. (2003) who argue that the quality of political institutions as practiced by the colonizers is influenced by the resource endowment and the disease environment of the countries left by the colonizers. They argue that countries endowed with natural resources may create extractive industries which are likely to inherit disease environments. Beck et al. (2003) note that these countries exhibit weak property rights and contract enforcement, which negatively affect financial development. They also argue that the colonizers created institutions that do not favour free competitive and developed financial markets in an extractive environment because competitive markets may threaten the position of the extractors (colonizers). In contrast with settler colonies, the colonizers created institutions that protected property rights and foster financial development because the colonizers settled in those colonies. For instance, countries like South Africa and Australia have strong, competitive and developed financial markets because the atmosphere was suitable for the colonizers to settle whereas non-settler colonies such as DR Congo and others were left with weak and non-competitive financial markets environment.

Beck et al. (2003) argue that the differences in the endowment determine the nature of institutional arrangements in the respective colonies and this has long-lasting repercussions on those colonies long after the colonizers have left. The weak nature of political institutions in the extractive colonies makes post-colonial leaders exploit the weak political institutions left behind by the colonizers to their advantage and profit from the natural resource endowment. This is the case in DR Congo, Congo, Gabon, Nigeria, and Latin America. For instance, DR Congo continues to experience many years of civil and political wars due to the weak nature of political institutions left behind by their colonial masters. Their post-independence new rulers did not enact laws to protect the citizen's private properties, they rather took advantage of the weak political institutions to appropriate the nation's natural resources for their private gain (Beck et al., 2003).

Therefore, delineating oil revenues into ownership structure is key to ensuring sustainable management of oil revenues. This is because government opts to ensure that its share of oil revenues is well-utilized while ensuring that private sector (IOCs) contractual agreements in the oil sector are enforceable. Property rights and contractual agreements are enforceable in strong political-institutional environments. Bhattacharyya (2013) summarizes this succinctly by arguing that weak contracting institutions possess low financial development while states with strong institutions have well-developed financial markets.

Secondly, the "capital scarcity and risk premium theory" supports how a windfall from oil revenues are managed by countries with limited infrastructure and countries with abundant infrastructure. Van der Ploeg and Venables (2011) argue that countries with limited infrastructure and higher debt components can borrow with a world interest rate plus a risk premium. According to the authors, countries with oil revenues should use the revenues to accelerate the growth in consumption towards long-run value rather than increasing their investment in Sovereign Wealth Funds (SWFs) and vice versa. This theory reveals that in countries with a scarcity of infrastructure, domestic investment of oil revenues will scale up their infrastructure rather than accumulating foreign assets like SWFs. The focus of this study is on converting natural capital to physical capital, scaling-up infrastructure, and how the financial sector benefits or aids physical capital investment. Therefore, government and private investment in oil revenues may support financial markets and institutions' depth, access, and efficiency in oil-producing countries by intermediating the role of political institutions (Bhattacharyya, 2013).

### 1.3. Empirical literature

There is a wealth of studies on the resource curse thesis, which broadly focus on the relationship between natural resource abundance and economic growth. Recent literature on resource curse thesis extends to financial development. This helps in understanding why some resource-rich countries grow or develop less relative to some resource-poor countries. We, similarly, examine the availability of resource curse in financial markets' and institutions' development by intermediating with the role of political institutions. This section's presentation and discussion focus on the recent extensions of the resource curse thesis to financial development. In particular, the study looks at the ownership structure of oil revenues and the role of political institutions in mitigating the negative impact of oil revenues on financial development.

#### 1.3.1. Natural resource revenue and financial development

There is a wealth of studies that examine the link between natural resources and financial development (see Kurronen, 2015; Dwumfour and Ntow-Gyamfi, 2018; Asif et al., 2020; Khan et al., 2020; Dogan et al., 2020; Mlachila and Ouedraogo, 2020; Jiang et al.,

2021; Umar et al., 2021). Specifically, Kurronen (2015) reveals that the banking sector tends to be smaller but the use of market-based financing is more common in resource-dependent economies. The study concludes that while the financial sector formation is according to the needs of the resource sector it is unfavourable to businesses that tend to reinforce the resource curse. Dwumfour and Ntow-Gyamfi (2018) discover that the resource curse on financial development is present in lower-middle-income countries but not in the North African region. Beck (2012) shows that liquid banks in natural resource-rich countries offer fewer loans. The study shows that these firms use less external finance and a smaller proportion of them use bank loans even though they have similar demand for bank credit as compared to their counterparts elsewhere. The author argues that this could be due to credit constraints, which might bring about the financial curse.

Furthermore, Asif et al. (2020) find a positive relationship between natural resources and financial development in the short run while a negative relationship results in the long run in Pakistan. Similarly, Khan et al. (2020) find that natural resource undermines financial development in 87 emerging countries. In using the nine indices of financial development created by IMF, Dogan et al. (2020) find a negative relationship between natural resources and financialization. They observe that the curse is more pronounced in financial markets than in financial institutions in 8 oil-rich countries. Mlachila and Ouedraogo (2020) find strong evidence of the financial curse in commodity price shocks in 68 commodity-rich developing countries. Canh and Thong (2020) document that an increase in natural resource rent has a positive effect on financial market depth but a negative effect on financial institutions' access and efficiency. Jiang et al. (2021) find a negative effect of the resource curse on financial development in China. Umar et al. (2021) indicate that during periods of oil boom banking efficiency declines, credit infection worsens, and profitability of default surges. Their findings validate the natural resource curse and explain why countries with more natural resources experience financial development curse. Based on this empirical literature hypothesis 1 is plausible.

**H<sub>1</sub>:** Government and private ownership of oil revenues for investment in the domestic economy negatively impact financial institutions and markets development in oil-producing countries with weak political institutions.

### 1.3.2. Natural resource revenue, political institutions, and financial development

This section looks at the literature in two ways. Firstly, the link between political institutions and financial markets and institutions. Secondly, the interaction between natural resources and political institutions on financial markets' and institutions' development. Some studies highlight the link between political institutions and financial development (see Atkinson and Hamilton, 2003; Iimi, 2007; Herger et al., 2008; Huang, 2010; Mavrotas et al., 2011; Adams et al., 2019a, 2019b). For instance, Atkinson and Hamilton (2003) document a situation where weak institutions exist, natural resource abundance tends to affect financial development when the government uses the resource revenues for consumption instead of investment, especially in countries with low levels of genuine savings. Also, Iimi (2007) notes that the powerful elite uses resource windfall for their benefit instead of infrastructural development to benefit all citizens. Iimi argues that the curse could be felt more in public institutional management as compared to private institutional management when state institutions get stronger. In a related study, Herger et al. (2008) indicate that through political institutions there could be a negative effect of colonial history on financial development. Huang (2010) notes that political institutions exert a positive effect on financial development while Mavrotas et al. (2011) opine that natural resource revenue can be a curse or blessing depending on a resource-rich country level of political institution. Adams et al., 2019a, 2019b reveal that strong political institutions support petroleum revenue management policies in Ghana. Adams et al., 2019a, 2019b observe that oil and gas MNCs are agents of globalization that promote the resource curse.

The second wave of the literature looks at the interaction between natural resource revenues and political institutions on financial market development (see Bhattacharyya and Hodler, 2014; Dwumfour and Ntow-Gyamfi, 2018; Khan et al., 2020; Kassouri et al., 2020; Mlachila and Ouedraogo, 2020). For instance, Bhattacharyya and Hodler (2014) show the extent to which the resource curse on financial markets could be averted through the quality of political institutions. They find that strong political institutions can lessen the degree of resource revenue curse on financial development in democratic countries. Dwumfour and Ntow-Gyamfi (2018) reveal that without proper political stability in North Africa, resource revenues will place a curse on financial development. They find that in the SSA region, institutional quality variables such as corruption, political stability, and voice & accountability have a significant and negative impact on financial development. In effect, they indicate that strong political institutions check corruption, and reduce credit provided to the private sector while proper regulatory quality helps to improve credit to the private sector. Furthermore, Khan et al. (2020) note that institutional quality has a positive effect on financial development and helps to turn the natural resource curse into a blessing in emerging and developing countries. Similarly, Kassouri et al. (2020) find that proper democratic credentials mitigate the financial curse in oil-exporting countries. Finally, Mlachila and Ouedraogo (2020) show that the financial curse is mitigated through the quality of governance. On the basis of the wealth of studies documented, hypothesis 2 has been developed.

**H<sub>2</sub>:** The negative impact of government and private ownership of oil revenues for investment in financial institutions and market development is mitigated in oil-producing countries with strong political institutions.

In summary, the literature highlights the important need for natural resource revenues for financial development. While few studies document a positive relationship between natural resources and financial development, other studies find a negative relationship depicting the natural resource and financial curse hypothesis. Similarly, the impact of political institutions on financial development has also been mixed with some studies depicting a blessing while others are depicting a curse. Finally, the interaction between natural resources and political institutions on financial development shows that at a higher level of political institutions the curse on the natural resource is dissolute. There is little evidence on how natural resource management affects financial development. Finally, the moderating role of political institutions on natural resource management on financial development in oil-producing countries has not been examined in the prior literature. Specifically, this study adds to the existing literature by focusing on government and private investment of oil revenues and their interaction with political institutions on financial development.

**Table 1**  
Definitions of financial markets and institutions.

Item	Financial Institutions	Financial Markets
<b>Depth</b>	The composition of financial institutions depth includes; Private -sector credit (% of GDP), Pension funds' assets (% of GDP), Mutual funds' assets (% of GDP), and Insurance premiums, both for life and non-life (% of GDP).	The depth of the financial markets captures the following. Stock market capitalization to GDP, stock market traded to GDP, International debt securities government (% of GDP), international debt securities of nonfinancial corporations (% of GDP), and total debt securities of financial corporations (% of GDP).
<b>Access</b>	This comprises financial institutions bank branches (commercial banks) per 100,000 adults and ATMs, per 100,000 adults. These measures are only limited to banking institutions because data for other financial institutions are not available.	Percentage of market capitalization outside of the top 10 largest companies and a total number of issuers' debt (domestic and external, nonfinancial corporations, and financial corporations).
<b>Efficiency</b>	These measures are limited to banks. They comprise net interest margin, lending-deposits spread, non-interest income to total income, the overhead cost to total assets, return on assets and return on equity.	Stock market turnover ratio (stocks traded/ capitalization). This is a measure of the liquidity of the stock market.

This table presents the six definitions of variables for both financial institutions and markets. The first column shows the depth, access and efficiency measures of financial development. Column 2 provides the measures of financial institutions in terms of depth, access and efficiency. Column 3 shows the definitions of financial markets depth, access and efficiency. All the data for these variables and their definitions are obtained from [Sahay et al. \(2015\)](#) and [Sviryzdenka \(2016\)](#) broad measures of financial development.

#### 1.4. Methodology

##### 1.4.1. Data and variables

The panel for this study consists of a cross-sectional dimension of 82 oil-producing countries with data covering the period 1990–2015. The data is from several sources, which include the International Monetary Fund (IMF, 2017) Investment and Capital Stock Dataset, 1960–2015. This provides data for government and private investments in fixed capital formation. Oil rent and other control variables data are from World Development Indicators (WDIs) of the World Bank. The financial markets and institutions' data are from an Index of financial development proposed by [Sviryzdenka \(2016\)](#) in a paper titled "Introducing a New Broad-based Index of Financial Development" and [Sahay et al. \(2015\)](#). These papers provide a detailed methodology of how the financial development index (depth, access, and efficiency) is constructed for about 183 countries in less developed, emerging, and developed financial markets for the period 1980–2015. Political institutions data is obtained from the Polity IV database and Freedom House. The financial openness data is obtained from [Chinn and Ito's \(2008\)](#) measure of capital accounts openness as the study's indicator of financial openness.

##### 1.4.2. Financial institutions and markets

[Sahay et al. \(2015\)](#) and [Sviryzdenka \(2016\)](#) provide broad measures of financial development, which are nine sets of variables to capture financial development for 183 countries. These measures are much broader than the traditional measures of financial development such as credit to the private sector as a percentage of GDP and stock market capitalization as a percentage of GDP. In this study, six broad measures of financial development are used (Financial Institutions and Financial Markets). [Table 1](#) presents their definitions.

##### 1.4.3. Ownership structure of oil revenues

The ownership structure of oil revenues are the shares of government investment of oil revenues and the share of private investment of oil revenues. The computation of these shares are done by using data for oil rent and fixed capital formation for government investments and private investments as well as other control variables such as inflation and GDP growth rate in a panel VAR model discussed in [section 1.4.2](#) below. [van der Ploeg \(2011\)](#), defines the rent of a commodity as the economic profit accruing from paying out all the factors of production and considering the opportunity cost of production, essentially above the marginal costs. The inflow of oil revenues increases the liquidity position of financial institutions and markets thereby making more funds available for proper financial intermediation ([Beck, 2012](#)). This in effect can facilitate the development of financial institutions and markets in oil-producing countries.

##### 1.4.4. Political institutions

Political institutions are those institutions that create, enforce, and apply laws within a country. They include the executive, legislature, judiciary, bureaucracy, forms of representation, the electoral process, pressure groups, political parties, etc. This study employs four political institutions measures which are discussed below:

- **Executive Constraints:** This is the limit of the executive arm of government due to checks and balances from parliament, judiciary, and civil society organizations. This means that in countries with better checks and balances, the government cannot influence state institutions that are mandated with the management of oil revenues. The data is obtained from the Polity IV index by Marshall, Jaggers, and Gur (2019), which ranges between 1 and 7 with lower values indicating weak executive constraints "less limitation" on the chief executive officer (President) in year  $t - 1$  and higher values indicating strong executive constraints "substantial limitations" on the chief executive officer in year  $t - 1$ . This is rescaled to lie between 0 and 1 with values below 0.5 being weak

executive constraint, values between 0.5 and below 0.8 as moderate executive constraint, and values above 0.8 being strong executive constraints.

- **Democracy:** Democracy is the extent to which citizens have the freedom to freely choose their leaders and participate actively in political activities. The data is taken from the Polity2 index, which ranges between – 10 and 10 and takes negative values for non-democratic governments and positive values for democratic governments. This is rescaled between 0 and 1, with – 10 for 0 values and + 10 for 1. This is from the Polity IV project by Marshall et al. (2019).
- **Political Rights:** This gives the citizens the right to participate in political activities such as exercising their franchise, holding public office, and other political activities. This data is from Freedom House. We coded 1 for all values ranging between 1 and 3 and coded as 0 for values from 4 to 7. Smaller values of political rights denote greater rights while larger values denote worse political rights.
- **Civil Liberties:** This refers to the freedom of speech guaranteed to citizens from arbitrary government interference, especially by denial of government power. These are codified in countries’ constitutions; this information is from the Freedom House. It ranges from 1 to 7 with smaller values depicting good civil liberties and higher values depicting bad civil liberties. In this study, we coded 1–3 as 1 and 4–7 as 0. The essence of this choice is that countries with lower values are considered to have strong civil liberties and countries with higher values are considered to have poor civil liberties.

1.4.5. Control variable

Some of the factors that account for financial development include income, education, inflation, foreign direct investment, and financial openness. GDP per capita controls the income level of countries since income is an important determinant of financial development (Kurronen, 2015). Countries with higher income levels are more likely to develop financial markets through improved financial access, efficiency, and depth of the financial markets. Secondary school enrolment is used to indicate the level of education as more educated people are more likely to understand complex financial market issues and participate in financial markets than less educated ones (see Bhattacharyya and Hodler, 2014; Kurronen, 2015; Dwumfour and Ntow-Gyamfi, 2018). Inflation describes the consumer price index and interest rate for the stability of the economy, and foreign direct investment represents foreign participation of companies in the local economy and this facilitates financial market developments (Kurronen, 2015). The financial openness is taken from Chinn and Ito (2008). Financial openness liberalizes the financial sector thereby enhancing liquidity inflow and leading to the development of financial institutions and markets. The financial openness index measures the degree of a country’s capital account openness computed by taking the first principal component of four dummy variables that measure the existence of multiple exchange rates, restrictions on the current accounts, capital account transactions, and requirement for the surrender of export proceeds. The low value of the index indicates low openness and a high value implies high financial openness.

1.5. Computation of ownership structure of oil revenues

This section provides insights into how the ownership structure of oil revenues is derived. Mohammed et al. (2020) provide a vivid computation of the ownership structure of oil revenues which this paper adopts. The government investment of oil revenues (GOR) is derived by using existing oil rent data, government investment (health, education, and infrastructure) and private investment of oil revenues (POR) using the fixed capital formation data from the IMF. Mohammed et al. (2020) argue that the ownership structure of oil revenues forms physical capital management of oil wealth since it is about converting natural capital to physical capital. Prior study such as Khanna (2017) argues that ownership structure of oil revenues focuses on controlling rights of government and IOCs but this current study computation of GOR and POR focus on the proportion of the oil revenues invested by government and what is invested by IOCs in oil-producing countries.

Following Mohammed et al. (2020), the Panel Vector Autoregressive (PVAR) model is used to predict the ownership structure of oil revenues for government investments and private investments. This model allows us to carry out casual interpretations of the variables, solve endogeneity and heterogeneity problems. The general, PVAR model is written compactly as follow:

$$y_{it} = \sum_{t=1}^n \beta_t y_{it-1} + \mu_{it} \tag{1}$$

where y is k \* 1 vector of k variables, β is a k \* k vector of parameters to be estimated and μ<sub>it</sub> is a composite term that is made up of time fixed effects (v<sub>t</sub>), unobserved country effect (γ<sub>i</sub>), and random error term (ε<sub>it</sub>), t is time and i is an individual unit, which represents countries in this study. The general PVAR in equation (Eq.1) in specific terms for the predictions are expressed as follows;

$$GI_{it} = \sum_{t=1}^n \alpha_{gi} GI_{it-1} + \sum_{t=1}^n \alpha_{pi} PI_{it-1} + \sum_{t=1}^n \alpha_{oi} OilRent_{it-1} + \alpha_f inflat_{it} + \alpha_{GD} GDP_{it} + \mu_{it}^{GI} \tag{2}$$

$$PI_{it} = \sum_{t=1}^n \beta_{gi} GI_{it-1} + \sum_{t=1}^n \beta_{pi} PI_{it-1} + \sum_{t=1}^n \beta_{oi} OilRent_{it-1} + \beta_f inflat_{it} + \beta_{GD} GDP_{it} + \mu_{it}^{PI} \tag{3}$$

$$OilReent_{it} = \sum_{t=1}^n \theta_{gi} GI_{it-1} + \sum_{t=1}^n \theta_{pi} PI_{it-1} + \sum_{t=1}^n \theta_{oi} OilRent_{it-1} + \theta_f inflat_{it} + \theta_{GD} GDP_{it} + \mu_{it}^{Oil} \tag{4}$$

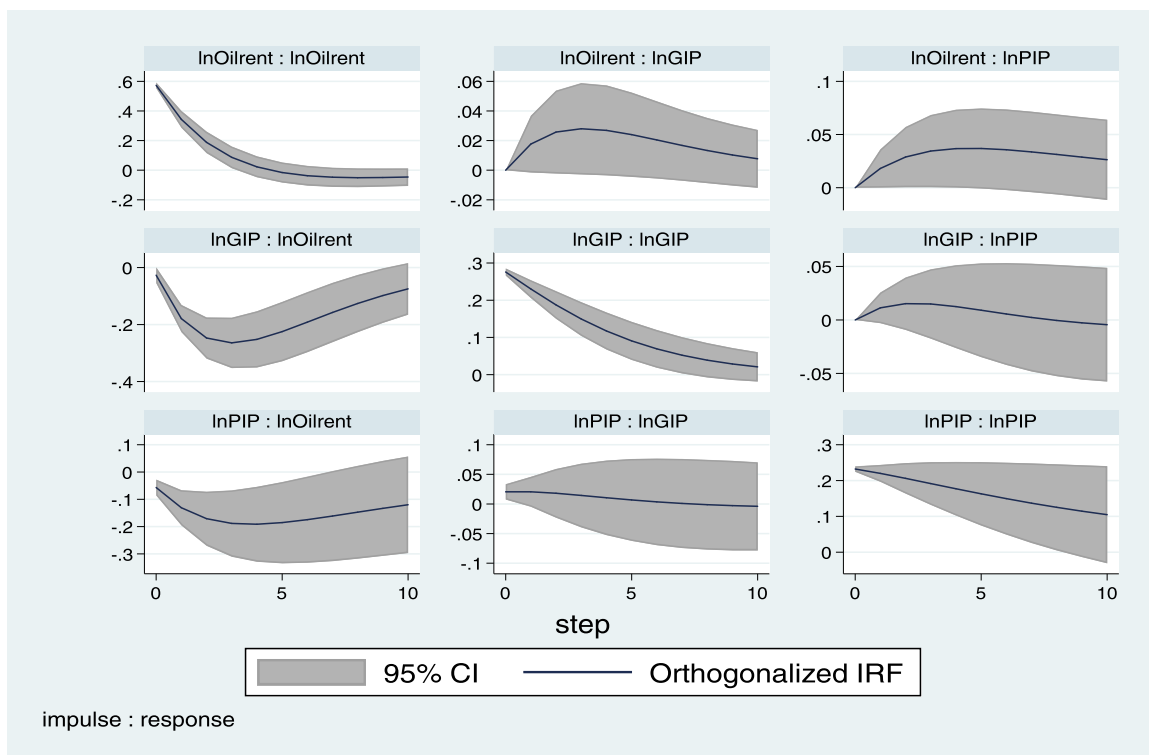


Fig. 4. Impulse response functions (IRF) computed from estimated PVAR. This graph shows the impulse response function computed using 95% confidence interval after estimating the PVAR. It uses 1000 replications to bootstrap the results. It is estimated at 10 years depicting a long-run effect of the variables for oil rent, government investment and private investment of fixed capital formation. The data is obtained from World Development Indicators and the IMF.

According to Mohammed et al. (2020) these three Eqs. (2, 3, and 4) are jointly estimated, where GI denotes government investment, PI is private investment, OilRent represents the oil rent, inflat. is inflation and GDP is real GDP per capita. The alphas ( $\alpha$ ) are the coefficients to be estimated in the government investment equation, betas ( $\beta$ ) are coefficients to be estimated in the private investment equation and thetas ( $\theta$ ) are coefficients to be estimated from the oil rent Eq. (4). Inflation is used to proxy macroeconomic stability such as the role of interest rates on the investment climate.

Based on the coefficient estimate for oil rent ( $\alpha_o$ ) from Eq. (2), the series on government investment of oil revenues (GOR) is determined for each country by multiplying the oil rent coefficient ( $\alpha_o$ ) by government investments series. Similarly, in the case of the share of private investment of the oil revenues (POR), is computed by using the coefficient estimate for oil rent ( $\beta_o$ ) from Eq. (3) and multiplying it by the private investment series for each country.

The study considers this approach to be more appropriate because it is fitted as a causal model of investment that allows for a dynamic structure in the estimation process suggested by the investment theory (Mohammed et al., 2020). Moreover, it indicates a system where the key variables in the model (government investment, private investment, and oil rent are endogenous); and unobserved heterogeneity in the estimation in both country fixed effects and time fixed effects. Furthermore, it accounts for macroeconomic stability using inflation, which indirectly considers the interest rate effect on investment. Given the system approach, the causal framework and the fact that it controls the key factors for investment, the prediction of investment from a model based on oil rent provides a reliable estimate of investment (government and private), where all key drivers are held constant. The predicted proportions from the PVAR are proxies for the real shares of oil revenue investment by the government and the private sector which is used in the second stage of the estimation on the impact of ownership structure of oil revenues on financial markets by intermedating it with political institutions.

In line with Liaqat (2019), the PVAR model is estimated with a generalized method of moment (GMM) by using the lagged values of the regressors as instruments. After the estimation, the impulse response functions (IRF) are computed from the estimated PVAR results in Eqs. 2–4 above. The monte Carlo simulation is used to compute the IRFs confidence intervals. Besides, the key variables of interest like oil rent, government investment, and private investment. The study includes, exogenous variables like inflation and gross domestic product rate in the model. The Cholesky ordering is used in the estimation of the equations as well as bootstrapping the model by one thousand (1000) replications (Lof and Malinen, 2014). The motivation for doing this is that oil revenue is influenced by government and private investment in the upstream oil-sector which leads to the discovery of new oil wells thereby increasing future government and private share of oil revenues. Usually, the oil industry is capital intensive, which is heavily financed by the private sector especially where there is a production sharing agreement contract between the owners of the oil resource and the IOCs. Fig. 4 shows the impulse

**Table 2**  
Descriptive statistics.

Variable	Obs.	Mean	Std.Dev.	Min	Max
<b>Financial Institutions</b>					
Depth	2158	0.254	0.262	0.000	1.000
Access	2158	0.314	0.270	0.000	1.000
Efficiency	2158	0.616	0.185	0.000	0.913
<b>Financial Markets</b>					
Depth	2158	0.231	0.264	0.000	0.998
Access	2158	0.242	0.260	0.000	1.000
Efficiency	2158	0.282	0.337	0.000	1.000
<b>Political Institutions</b>					
Executive Constraint	2089	0.603	0.356	0.000	1.000
Political Rights	2158	0.506	0.500	0.000	1.000
Civil Liberty	2158	0.613	0.487	0.000	1.000
Democracy	2155	0.650	0.480	0.000	1.000
<b>Ownership Structure of Oil</b>					
Gov't Oil Revenue	2157	0.231	0.189	0.000	1.401
Private Oil Revenue	2156	0.801	0.433	0.016	4.192
<b>Control Variables</b>					
GDP per capita	2154	18,650.18	21,312.92	555.424	152,000
Inflation	1918	1.755	1.466	-3.305	10.076
Schooling	1631	4.289	0.475	1.891	5.064
Foreign Direct Investment	1941	0.637	1.460	-10.571	5.087
Financial Openness	2070	0.273	1.603	-1.910	2.360

This table provides the descriptive statistics of all the variables used in the empirical analysis. It provides the descriptive statistics for financial institutions and markets depth, access and efficiency. It also shows political institutions variables namely executive constraints, political rights, civil liberties and democracy as defined in section 4.1.4 above. The ownership structure variables are government oil revenues and private oil revenues. Control variables are GDP per capita; inflation, schooling, foreign direct investment and financial openness are all reported. The data is obtained from World Development Indicators, IMF, Polity IV index and Chin and Ito, (2008).

response functions computed from the estimated PVAR.

The results of the IRF indicate that oil rent due to government investment is approximately 0.031 which occurs around the second year of oil extraction. Similarly, the private investment occurs at year two with a value of 0.032 at the peak level of the orthogonal IRF at the top right corner of the graph. These coefficients aid in the construction of the ownership structure of oil revenues variables in this study.

Furthermore, Table A2 presents the results of the PVAR model while Table A3 of the appendix presents the stability test. The diagnostics of the preliminary (PVAR) results are discussed here while the full results are shown in the appendix. With the PVAR model fit, Hansen-J test for over-identification is performed, which is a specification test to determine the validity of the over-identifying restrictions. In the Table A2 of the appendix, the test results indicate that the model fits the data generation process (DGP) and therefore, is not misspecified. Secondly, the stability test presented in Table A3, indicates that the estimated PVAR model is stable since eigenvalues are all less than 1 as suggested by Hamilton (1994) and Lütkepohl (2005) for such a stability test.

### 1.6. Empirical strategy

In the second stage of the estimation, the predicted data on the ownership structure of oil revenues (government vs. private) is used to estimate its impact on financial markets and institutions by considering the role of political institutions. The model is specified by following Bhattacharyya and Hodler (2014); Kurronen (2015) and Khanna (2017). The model is specified below.

$$FIMD_{it} = \alpha_i + \theta_t + \delta_1 \ln OSOIL_{it} + \delta_2 INST_{it-1} + \alpha_3 \ln OSOIL_{it} * INST_{it-1} + \Lambda X'_{it} + \varepsilon_{it} \tag{5}$$

In the model,  $FIMD_{it}$  represents financial institutions and markets development.  $\alpha_i$  represents the country-specific fixed effect,  $\theta_t$  is a year-specific fixed effect. These fixed effects account for both unobserved country and time heterogeneities, respectively. Secondly, country fixed effects control time-invariant factors like initial endowments, legal origins, and social capital (Bhattacharyya and Hodler, 2014). This is because they are important in explaining the institutional origins of the countries.  $\ln OSOIL_{it}$  represents the ownership structure of oil revenues variables which is broken down into the share of government investment of oil revenues  $GOR_{it}$  and the share of private investment of oil revenues  $POR_{it}$  in the domestic economy,  $INST_{it-1}$  is the political institutions' variables (executive constraints, democracy, political rights, and civil liberties). The lags of the political institutions' variables cater for endogeneity that occurs because of implementing government policies that affect both the government and the private sector (Khanna, 2017).  $X'_{it}$  is the vector of control variables such as GDP per capita, inflation, education, foreign direct investment, and financial openness relevant for the study (see Bhattacharyya and Hodler, 2014; Kurronen, 2015; Dwumfour and Ntow-Gyamfi, 2018).  $\varepsilon_{it}$  is the idiosyncratic error term. Furthermore, the two-step system GMM is estimated and the results are reported in Appendix A4 and A5. These results are used to address the issue of endogeneity in the fixed effects models we estimated. Ullah et al. (2018) indicate that differences in the results reported using OLS, Fixed Effects, and GMM could be due to endogeneity issues. The models are estimated with the robust standard errors to correct

**Table 3**  
Ownership structure of oil revenues, executive constraint, and financial institutions.

Variables	Full Sample			Developing Countries		
	Depth	Access	Efficiency	Depth	Access	Efficiency
GOR	-0.013 ** (0.005)	-0.017 * (0.009)	-0.020 * (0.011)	-0.013 ** (0.005)	-0.025 *** (0.009)	-0.020 * (0.010)
EXC <sub>t-1</sub>	0.008 (0.024)	0.123 *** (0.033)	0.123 *** (0.034)	0.009 (0.028)	0.120 *** (0.033)	0.109 *** (0.037)
GOR*EXC <sub>t-1</sub>	-0.008 (0.014)	0.018 (0.015)	0.049 *** (0.018)	-0.006 (0.016)	0.018 (0.015)	0.040 ** (0.019)
POR	-0.020 ** (0.009)	-0.084 *** (0.011)	-0.016 (0.015)	-0.019 ** (0.009)	-0.087 *** (0.011)	-0.016 (0.015)
POR* EXC <sub>t-1</sub>	0.026 * (0.014)	0.120 *** (0.015)	0.043 ** (0.020)	0.021 (0.015)	0.114 *** (0.015)	0.040 ** (0.020)
Education	-0.016 (0.011)	-0.007 (0.018)	0.025 (0.021)	-0.017 (0.011)	-0.006 (0.018)	0.014 (0.023)
Inflation	0.004 ** (0.002)	-0.001 (0.002)	-0.001 (0.002)	0.004 ** (0.002)	0.000 (0.002)	-0.003 (0.002)
GDPPC	0.063 *** (0.009)	0.152 *** (0.019)	0.075 *** (0.019)	0.065 *** (0.009)	0.113 *** (0.016)	0.050 *** (0.019)
FDI	0.002 (0.001)	0.003 (0.002)	-0.008 *** (0.002)	0.001 (0.002)	0.004 * (0.002)	-0.009 ** (0.003)
FINOPEN	0.007 *** (0.002)	0.021 *** (0.003)	0.008 ** (0.003)	0.006 ** (0.003)	0.024 *** (0.003)	0.008 ** (0.004)
Constant	-0.533 *** (0.085)	-1.178 *** (0.165)	-0.141 (0.166)	-0.534 *** (0.092)	-0.857 *** (0.147)	0.134 (0.169)
Observations	1193	1195	1195	930	932	932
R-squared	0.979	0.943	0.816	0.957	0.91	0.806
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES

This table reports the estimates on the ownership structure of oil revenues and financial institutions and the intermediating role of executive constraints for the period 1990–2015. We estimate for full sample and developing countries samples for depth, access and efficiency. GOR is the share of government oil revenue, POR is the share of private oil revenue, EXC<sub>t-1</sub> is an executive constraint. GOR\*EXC<sub>t-1</sub> is the interaction between the share of government oil revenue and executive constraint, POR\*EXC<sub>t-1</sub> is the interaction between the share of private oil revenue and executive constraint. Education is a logarithm of secondary school enrolment. Inflation is the log of the consumer price index, GDPPC is the log of gross domestic product per capita, FDI is a foreign direct investment as a percentage of GDP and FINOPEN is the financial openness index for capital account openness. Standard errors are clustered at country level and in parenthesis. \*\*\*, \*\* or \* indicates that the coefficient estimate is significant at 1%, 5% or 10% level respectively.

for autocorrelation and heteroskedasticity.

From Eq. (5) above, the main variable of interest is derived by taking the partial derivative of  $FIMD_{it}$  with respect to  $OSOIL_{it}$ . This is shown below:

$$\frac{\partial FIMD_{it}}{\partial \ln OSOIL_{it}} = \delta_1 + \delta_3 * \ln INST_{it-1} \tag{6}$$

The implication of Eq. (6) is that whether the effect of government share or private share of oil revenues are positive, negative or zero depends on the magnitude of the coefficients of interest, thus,  $\delta_1$  and  $\delta_3$  as well as the level of the political institutions of each oil-producing country. To put this in a clearer perspective, the extent to which government or the IOCs invest oil revenues into productive sectors of the economy to enhance financial markets' and institutions' development depends on the level (quality) of political institutions of the country.

### 1.7. Results and discussion

This section presents the results of the study. Firstly, descriptive statistics is provided. Secondly, the results on the impact of ownership structure of oil revenues on financial institutions and markets development in the light of political institutions is discussed. Thirdly, the study provides the robustness of the study with alternative measures of political institutions (democracy, political rights, and civil liberties).

### 1.7.1. Summary statistics

This section provides a discussion on the descriptive statistics of the study. Table 2<sup>1</sup> below shows a detailed summary of the statistics of the study. The summary statistics reveals that the average financial institution's depth records 25.4%, access on average is 31.4% and efficiency of financial institution is the highest, with a record of 61.6% averagely. The greater percentage points reported for the efficiency is due to the greater number of developing countries in the sample. In developing countries, banks and other financial institutions charge high interest rates, which increases their profit margins thereby making them much efficient. Financial markets depth records an average of 23.1%, access records 24.2%, and efficiency records an average of 28.2%. On average, efficiency records the highest, implying that stock markets are relatively much liquid thereby making the conversion of stocks into cash much easier.

For the aspect of political institutions, executive constraints record an average of 0.603 units, political rights record an average of 0.506, and civil liberties record an average of 0.613. This means that on average most of the countries have moderate institutional quality since the range is between 0 and 1.

For oil revenues, the study records an average of 0.231 units for government share of the investment of the oil revenues. The private sector records a share of 0.801 units for its oil revenues. This means that the private sector receives a higher share of oil revenues than the government sector. This is because the private sector invests in the discovery of oil wells, exploration, and drilling, which makes its share higher than the government whose revenues mainly comes from taxes, royalties, participation share, surface rentals, etc., which are generally of a lower amount as compared to the main investors' share.

Similarly, GDP per capita (income) records an average of US\$18,650.18 over the sample period. Inflation records an average of 1.755 units while education records an average school enrolment of 4.289 units for the sample period. Foreign direct investment records an average of 63.7% of GDP. This implies that more foreigners participate in the domestic economy of oil-producing countries (Kurronen, 2015). Finally, financial openness records an average of 0.273 units, which suggests that most of the countries open up their economy for the free flow of funds.

### 1.7.2. Ownership structure of oil revenues and financial institutions: the role of executive constraints

This section reports result on the impact of oil revenues investment by the government (GOR) and private (POR) sector on the development of financial institutions by considering the role of executive constraints. The results are presented for the full sample countries and developing countries samples because the nature of the development of financial institutions in developing countries is generally low as compared to the developed countries. Therefore, results based on a sample that contains both may be influenced by the proportion of developed countries in the sample. In developed countries like Japan and the United States of America, financial institutions development is close to 100 per cent while some countries like Equatorial Guinea are far lower. Also, fixed-effects model results are discussed while two-step system GMM results are reported in appendix A4. In general, the discussion of the results follows the fixed-effect model and using the GMM as robustness checks. In some cases, the study finds consistency in the results of the fixed effects and GMM, while the results differ in other cases. Overall, the results are in line with theoretical postulations.

The full sample in Table 3, proves that the coefficient estimates on GOR is negative and significant for both depth and access of financial institutions. This means as government investment increases there is no corresponding growth in financial institutions' depth and access. In other words, government investment in oil revenues hurts the private sector's access to credit and the broadening of financial services to all segments of the population (Bhattacharyya and Hodler, 2014; Dogan et al., 2020). The implication is that the political elites are using the oil money for their benefits instead of using it for projects that can directly benefit the financial institutions (Ross, 2006; Iimi, 2007). This finding also confirms the endowment theory of financial development by Beck et al. (2003).

Furthermore, the results show significant investment of oil revenues by the government has a drag on financial institutions' efficiency. Evidence from the model estimated reveals that private investment of oil revenues negatively correlates with the depth and access of financial institutions. Thus, private investment of oil funds in the local economy does not directly affect the productive sectors of the economy in such a way that it translates into broadening of the financial institutions' depth and access within the domestic economy. The implication of this finding is that because the oil sector requires substantial initial capital for investment, most of the rent that accrues to the private sector are repatriated to the parent company for either distribution to shareholders or prospecting in new oil fields (Mohammed et al., 2020). This finding is consistent with Dogan et al. (2020), who notes a significant negative impact of natural resource rent on financial institutions' access and efficiency in 8 oil-rich countries.

The study finds that executive constraints have positive and significant impact on the access and efficiency of financial institutions. This means that greater limitations on the powers of the chief executive officer (president) to act in a way that will derail the development of financial institutions can be curtailed. This result supports the finding of Huang (2010), Bhattacharyya and Hodler (2014), and Dwumfour and Ntow-Gyamfi (2018) who, collectively, note that political institutions play a major role in fostering financial development. It supports the endowment theory by Beck et al. (2003); Acemoglu and Johnson's (2005) and Bhattacharyya

<sup>1</sup> The correlation matrix for the variables in the study was carried out and it generally shows that none of the independent variables exhibits a high degree of collinearity. Also, variance inflation factor (VIF) was estimated and it satisfies the rule of thumb of no variable being greater than 10. Also, 1st and 2nd Generation Unit root test without and with cross-sectional dependence has been presented in appendix A1. To conserve space, the results of the correlation matrix and VIF are not reported but can be provided upon request.

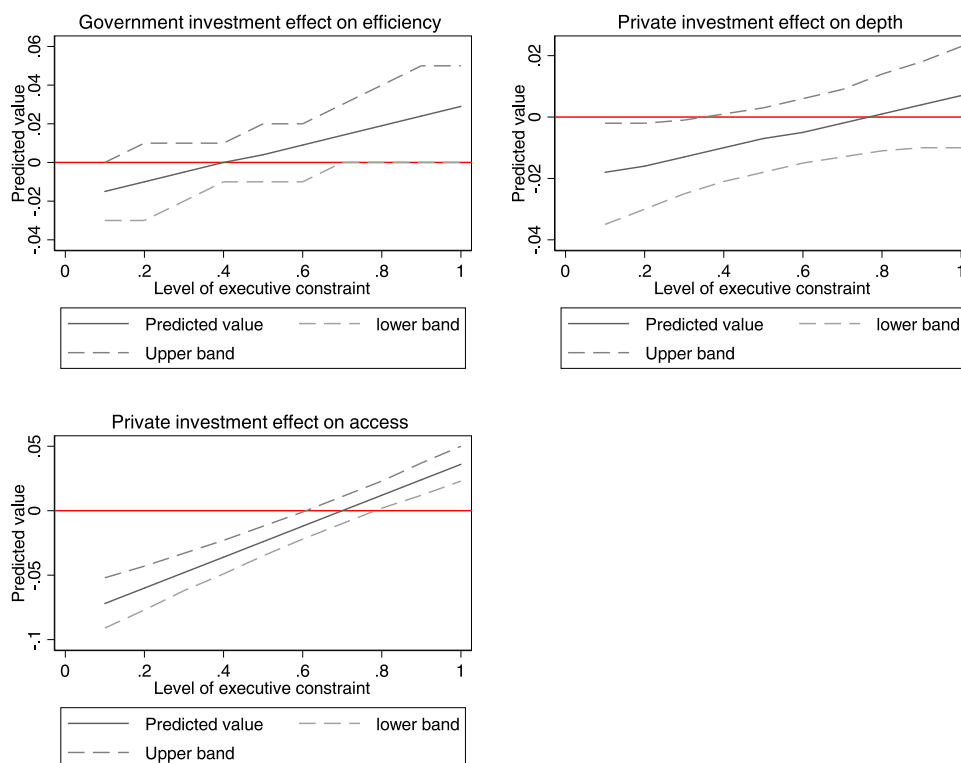


Fig. 5. Predicted impact of government and private investment of oil revenues on financial institutions at various levels of executive constraints. Note: The graphs are only for cases where we have a threshold effect for the full sample result. The threshold is defined in footnote 2.

(2013) who argue that the quality of institutions matters in financial development.

Specifically, interaction of government investment of oil revenues and executive constraints has a positive and significant impact on the efficiency of financial institutions. This indicates a threshold<sup>2</sup> effect of government revenue investment on the efficiency of financial institutions, where the threshold is driven by the level of executive constraints (the threshold effect is presented in Fig. 5). In countries with weak executive constraints, contracting and property rights institutions are likely to be weak. This hurts the efficiency of financial institutions. The reverse is true in the case of limited executive constraints and how that influences the impact of government oil revenue investment on the efficiency of financial institutions. In countries with strong executive constraints, the effect of government investment of the oil revenues is positive and negative for those with weak executive constraints. As regards depth and access dimensions, the interactive effect is insignificant at any of the conventional significance levels. In the context of developing countries, similar qualitative results are observed for government investment of oil revenues (the graph for the threshold effect is not reported but can be provided on request). This finding supports a wealth of literature on the nexus between natural resources, institutions, and financialization (e.g., Canh and Thong, 2020; Kassouri et al., 2020; Khan et al., 2020). The findings also support the theoretical argument by van der Ploeg and Venables (2011) for proper investment of oil windfall by natural resource rich-countries with capital scarcity (Table 3).

Furthermore, regarding the interactive effect between private investment and executive constraints, the study finds a positive and significant relationship with all three dimensions of financial institutions but a threshold effect only on depth and access dimensions (the coefficient on efficiency was insignificant). Fig. 5 indicates the threshold effects which depicts those countries with weak executive constraints, the effect of private investment on both depth and access of financial institutions is negative but positive in countries with strong executive constraints. Essentially, good participatory governance reduces the negative effect of government and private investment of oil revenues and thus turns it from a curse in the financial sector to a blessing among oil-producing countries. This finding is in line with Bhattacharyya and Hodler (2014); Dwumfour and Ntow-Gyamfi (2018); Kassouri et al. (2020); Khan et al. (2020) and Mlachila and Quedraogo (2020). This finding, however, provides further information than previous studies by providing the aspect of financial development (efficiency in the case of government investment of oil revenues and both access and depth dimensions in the case of private investment of oil revenue) that is deriving the threshold effect of political institutions (executive constraint) on

<sup>2</sup> The threshold effect in this study implies a significant interaction effect between executive constraint and ownership structure of oil revenues (government investment and private investment of oil revenues) that has an opposite sign to the coefficient of ownership structure, which is also significant. In such a case we expect a negative total effect of the ownership structure of oil revenues at a certain range of executive constraint and a positive effect at other range of executive constraint.

**Table 4**  
Ownership structure of oil revenues, executive constraints, and financial markets.

Variables	Fixed Effects			Fixed Effects		
	Depth	Access	Efficiency	Depth	Access	Efficiency
GOR	-0.038 * ** (0.011)	-0.012 (0.011)	-0.009 (0.018)	-0.034 * ** (0.010)	-0.010 (0.011)	-0.012 (0.018)
EXC <sub>t-1</sub>	-0.077 * * (0.036)	-0.029 (0.031)	-0.331 * ** (0.091)	-0.031 (0.034)	-0.027 (0.029)	-0.268 * ** (0.102)
GOR*EXC <sub>t-1</sub>	0.000 (0.017)	0.000 (0.016)	-0.038 (0.048)	0.028 * (0.016)	0.001 (0.016)	0.000 (0.055)
POR	0.042 * ** (0.014)	0.013 (0.012)	0.023 (0.023)	0.066 * ** (0.014)	0.0220 * (0.013)	0.040 * (0.023)
POR*EXC <sub>t-1</sub>	-0.014 (0.020)	-0.025 (0.017)	-0.011 (0.039)	-0.045 * * (0.019)	-0.035 * * (0.016)	-0.038 (0.040)
Education	-0.154 * ** (0.021)	-0.111 * ** (0.019)	0.000 (0.036)	-0.113 * ** (0.021)	-0.086 * ** (0.021)	0.015 (0.037)
Inflation	0.006 * (0.004)	0.004 (0.003)	0.024 * ** (0.007)	0.004 (0.003)	0.002 (0.003)	0.021 * ** (0.008)
GDPPC	-0.015 (0.020)	-0.052 * ** (0.018)	-0.095 * ** (0.032)	0.036 (0.022)	-0.033 * (0.020)	-0.075 * * (0.033)
FDI	0.008 * ** (0.003)	0.011 * ** (0.003)	0.018 * ** (0.005)	0.007 * * (0.003)	0.012 * ** (0.003)	0.017 * ** (0.005)
FINOPEN	0.015 * ** (0.004)	0.005 (0.004)	0.007 (0.009)	0.011 * ** (0.003)	0.001 (0.003)	0.002 (0.010)
Constant	0.573 * ** (0.195)	0.708 * ** (0.168)	0.774 * ** (0.295)	0.02 (0.220)	0.492 * ** (0.190)	0.564 * (0.320)
Observations	1195	1193	1195	932	930	932
R-squared	0.903	0.929	0.797	0.880	0.919	0.738
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES

This table provides the estimates of the ownership structure of oil revenues and financial markets and the intermediating role of executive constraints for the period 1990–2015. We estimate for full sample and the subsamples of developing countries for depth, access and efficiency. GOR is the share of government oil revenue, POR is the share of private oil revenue, EXC<sub>t-1</sub> is an executive constraint. GOR\*EXC<sub>t-1</sub> is the interaction between the share of government oil revenue and executive constraint, POR\*EXC<sub>t-1</sub> is the interaction between the share of private oil revenue and executive constraint. Education is a logarithm of secondary school enrolment. Inflation is the log of the consumer price index, GDPPC is the log of gross domestic product per capita, FDI is a foreign direct investment as a percentage of GDP and FINOPEN is the financial openness index for capital account openness. Standard errors are clustered at country level and in parenthesis. \* \*\*, \* \* or \* indicates that the coefficient estimate is significant at 1%, 5% or 10% level, respectively.

the impact of oil revenue on financial development (institutional development). Focusing on developing countries' perspective, similar results (qualitatively) are reported for the private investment of oil revenues.

In the case of the control variables, the study finds that inflation has positive and significant impact on the depth of financial institutions. This implies that as inflation increases the cost of borrowing rises, which stimulate financial institutions to give out more loans, induce insurance firms to charge higher premium and pension funds to increase their annuity payments to abate the cost of living. Again, the higher-income level increases the depth, access, and efficiency of financial institutions. This means that as the per capita income level of a country rises, the demand for financial services likewise increases, all other things being equal.

The study finds that FDI inflows reduce the efficiency of the financial institution and this can be as a result of the rate of repatriation of profit by foreign firms to their parent firms and hence affects the profitability of financial institutions. Financial openness provides a positive and significant effect on all the dimensions (depth, access, and efficiency). This implies that oil-producing countries open their economies for the inflows and outflows of funds, which helps to develop financial institutions. These findings fall in line with the prior expectations and existing literature (see [Bhattacharyya and Hodler, 2014](#); [Kurronen, 2015](#); [Dwumfour and Ntow-Gyamfi, 2018](#)).

### 1.7.3. Ownership structure of oil revenues and financial markets: The role of executive constraints

This section focuses on how government investment of oil revenues (GOR) and private investment of oil revenues (POR) influence the development of the financial markets by considering the role of executive constraints. As done in [section 1.7.2](#) above, the data is split between developed and developing countries and a case is made to the effect of financial markets development being higher in advanced economies as compared to developing economies. Hence, the need to check this unique heterogeneity. The results presented in [Table 4](#) are estimated with a fixed-effect model and the results of a two-step system GMM is reported in appendix A5. The result is robust for both fixed effects and GMM and are in line with the endowment theory of financial development. However, the discussion of the results is based on the fixed-effects model.

The full sample reports a negative and significant relationship between GOR and the depth of financial markets. The result implies that there is a financial curse on countries whose governments do not invest oil revenues very well in the domestic economy. This finding contravenes the work of [Canh and Thong \(2020\)](#) who find a positive relationship between natural resource rent and financial markets depth. Thus, inappropriate investment of oil revenues lowers the development of the stock and bond markets, respectively.

**Table A1**  
1st and 2nd Generation Panel Unit Root Test.

Variable	Im, Pesaran, and Shin		CADF	
fd_fid	-4.1139	***a	-3.372	***b
fd_fia			-3.518	***b
fd_fie	-15.3615	***a	-3.112	***a
fd_fmd	-5.6045	***a	-3.31	***b
fd_fma	c		-2.909	***b
fd_fme	c		-2.717	***b
GOR	-8.253	***a	-3.114	***a
POR	-7.748***		-1.573	***a
EXC	c		c	
PR	c		c	
CL	c		c	
Dem	c		c	
Education	c		c	
Inflation	-4.1899	***b	-3.873	***a
FDI	c		c	
FINOPEN	c		-4.05	***b
GDPPC	-16.614	***b	-9.145	***b

Notes: This table provides the estimates for 1<sup>st</sup> and 2<sup>nd</sup> generation unit root test. The Im, Pesaran, and Shin is the panel unit root test without cross-sectional dependence which stands for the first-generation unit root test of stationarity. CADF is the panel unit root test with cross-sectional dependence which represents the second-generation unit root test. fd\_fid is the financial institutions' depth, fd\_fia is financial institutions access, fd\_fie is financial institutions efficiency, fd\_fmd, financial markets depth, fd\_fma, financial markers access, fd\_fme, financial markets access, GOR is government oil revenues, POR is private oil revenues, EXC is executive constraints, PR is political rights, CL is a civil liberty, Dem is a democracy, FDI is foreign direct investment, FINOPEN is financial openness, GDPPC is GDP per capita. \*\*\* is significance at 1%, a, stationary at level, b is stationary at the first difference and c is no respondent either no enough data points or more zeros in the case of a dummy variable.

**Table A2**  
PVAR Estimates to Predict the Shares of Government and Private Investment.

	lnPIP	lnOilrent	lnGIP
lnPIP <sub>t-1</sub>	0.952*** (0.049)	-0.365** (0.128)	0.022 (0.050)
lnOilrent <sub>t-1</sub>	0.032** (0.016)	0.598*** (0.050)	0.031* (0.017)
lnGIP <sub>t-1</sub>	0.044 (0.028)	-0.591*** (0.082)	0.837*** (0.042)
Lngdpcap	-0.070** (0.034)	-0.334** (0.095)	-0.059 (0.043)
Inflation	-0.005 (0.070)	-0.182** (0.026)	-0.031** (0.012)
Observations	1681	1681	1681
J-Stats	279.820		
P-value	0.000		

The table provides estimates of PVAR to predict the ownership structure of oil revenues for the period 1990-2015. lnPIPt-1 is the logarithm of private investment, lnGIPT-1 is the logarithm of government investment. lnOilrentt-1 is the logarithm of oil rent as a percentage of GDP. Lngdpcap is the logarithm of GDP per capita. The data for this estimate is obtained from IMF and the World Development Indicators. The standard errors are clustered at country level in the parenthesis. \*\*\*, \*\* or \* for significance level of 1%, 5% and 10% respectively.

**Table A3**  
Eigenvalues for Stability Test of the PVAR Model.

Real	Imaginary	Modulus
0.917	0.000	0.916
0.735	0.085	0.740
0.735	-0.085	0.740

This table reports estimates on PVAR stability. All the eigenvalues lie inside the unit circle. PVAR satisfies stability conditions.

However, the study finds a positive and significant relationship with private investment for the depth of the financial markets. This finding supports the work of [Canh and Thong \(2020\)](#). This suggests that the presence of IOCs in oil-producing countries enhances the development of the financial markets' depth.

The executive constraints show a negative and significant relationship with the depth and efficiency of financial markets all other

**Table A4**  
Two-Step System GMM Results on Financial Institutions.

Variables	Full Sample			Developing Countries		
	Depth	Access	Efficiency	Depth	Access	Efficiency
GOR	0.002 (0.002)	-0.002 (0.002)	0.0323* (0.017)	0.002 (0.002)	-0.002 (0.002)	0.049** (0.023)
EXC <sub>t-1</sub>	0.002 (0.009)	0.013 (0.015)	0.037 (0.045)	0.012* (0.006)	0.024** (0.011)	-0.012 (0.053)
GOR*EXC <sub>t-1</sub>	-0.001 (0.004)	0.005 (0.005)	-0.009 (0.018)	-0.001 (0.004)	0.004 (0.004)	-0.033 (0.027)
POR	-0.001 (0.003)	0.001 (0.006)	-0.043** (0.020)	-0.005* (0.003)	-0.007** (0.004)	-0.057** (0.023)
POR*EXC <sub>t-1</sub>	0.006 (0.006)	0.001 (0.013)	0.131** (0.055)	0.017*** (0.006)	0.018*** (0.007)	0.164*** (0.061)
Education	0.000 (0.002)	0.004 (0.002)	0.017 (0.015)	0.000 (0.003)	0.003 (0.002)	0.046 (0.028)
Inflation	-0.001 (0.001)	-0.001 (0.001)	-0.007* (0.004)	0.000 (0.000)	0.000 (0.001)	-0.007 (0.005)
GDPPC	0.000 (0.002)	0.001 (0.004)	0.039** (0.018)	0.002 (0.001)	0.003 (0.002)	0.037** (0.017)
FDI	-0.001 (0.001)	0.000 (0.001)	-0.007* (0.004)	0.000 (0.001)	0.001 (0.001)	-0.010* (0.005)
FINOPEN	0.000 (0.001)	-0.001 (0.002)	-0.002 (0.004)	0.000 (0.001)	-0.001 (0.001)	-0.005 (0.006)
L.fd_fid	1.001*** (0.021)			0.962*** (0.017)		
L.fd_fia		1.006*** (0.041)			0.985*** (0.025)	
L.fd_fie			0.259 (0.310)			0.105 (0.333)
Constant	0.013 (0.018)	0.000 (0.000)	0.081 (0.093)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Observations	1,165	1,165	1,165	902	902	902
No. of Countries	77	77	77	61	61	61
Time Fixed Effects	YES	YES	YES	YES	YES	YES
Instrument	43	57	42	43	51	42
AR (1)	0.003	0.00	0.094	0.016	0.000	0.193
AR (2)	0.913	0.527	0.961	0.807	0.080	0.971
Hansen Test	0.126	0.115	0.136	0.525	0.270	0.368

This table presents the results of the estimates of ownership structure of oil revenues on financial institutions using system GMM for period 1990-2015. L.fd\_fid is the lagged of financial institutions depth; L. fd\_fia is lagged of financial institutions access and L.fd\_fie is the lagged of financial institutions efficiency. The standard errors are clustered at country level in the parenthesis. \*\*\*,\*\* or \* for significance level of 1%, 5% and 10% respectively.

things being equal. The interactive effect (POR\*EXC<sub>t-1</sub>) shows a negative and significant relationship with financial markets access. This means that as executive constraints get stronger, access to financial markets gets weaker. This finding contravenes the existing literature that establishes a positive relationship (see [Bhattacharyya and Hodler, 2014](#); [Dwumfour and Ntow-Gyamfi 2018](#), [Kassouri et al., 2020](#)). Although, the interaction is negative and significant for the access dimension of financial markets, it does not meet the requirement for a threshold effect since the coefficient estimate for private investment is insignificant at even the 10% significance level. In the case of developing countries sample, the evidence shows a threshold effect for both depth and access dimensions for private investment and only depth dimension for government investment. This finding confirms previous literature (see [Khan et al., 2020](#); [Kassouri et al., 2020](#); [Mlachila and Ouedraogo, 2020](#)). The finding suggests that the results from the developing countries' sample are qualitatively different from the full sample, but the current study argues that it is because of the differences between financial markets development, for developed and developing countries.

Regarding the control variables, the study finds that education has negative and significant impact on the depth and access to financial markets in both subsamples. This is because the data is dominated by developing countries where most citizens lack the financial literacy to understand how the stock markets work and operate. This makes them hesitant to invest in the stock market. The study finds that inflation has positive and a significant determinant of financial markets development, which means that inflation sends a signal of a higher returns to investors and that motivates investment in the stock markets leading to its development. Additionally, the study finds that GDP per capita has a negative and significant impact of financial markets access and efficiency showing that higher income does not necessarily mean people will participate in financial markets activities in oil-producing countries.

FDI enters the regression with strong and positive effects for the full and developing countries samples. This means that Multinational Corporations (MNCs) participation in the economy improves financial markets activities since MNCs are usually listed on the stock markets; this adds more to their depth and access to financial markets. Finally, financial openness enters the regression with a positive and significant effect on the depth of financial markets for both samples. This means that an open economy attracts the inflows of foreign capital, which are used in the productive sectors of oil-producing countries' economies by freeing-up more resources for the

**Table A5**  
Two-Step System GMM Results on Financial Markets.

Variables	Full Sample			Developing Countries		
	Depth	Access	Efficiency	Depth	Access	Efficiency
GOR	0.004 (0.004)	-0.002 (0.002)	0.008 (0.007)	0.004 (0.005)	0.001 (0.003)	0.010 (0.013)
EXC <sub>t-1</sub>	0.010 (0.016)	0.012 (0.008)	-0.062** (0.030)	0.006 (0.016)	0.002 (0.008)	-0.058 (0.035)
GOR*EXC <sub>t-1</sub>	-0.003 (0.008)	0.008 (0.005)	-0.031** (0.015)	-0.003 (0.008)	0.003 (0.005)	-0.0360* (0.018)
POR	-0.001 (0.007)	0.003 (0.003)	0.012 (0.012)	-0.001 (0.007)	0.003 (0.006)	0.008 (0.013)
POR*EXC <sub>t-1</sub>	0.017 (0.014)	-0.0112* (0.007)	-0.019 (0.031)	0.009 (0.015)	-0.003 (0.009)	-0.012 (0.035)
Education	-0.001 (0.007)	0.007*** (0.002)	0.007 (0.005)	-0.003 (0.010)	0.008* (0.004)	0.006 (0.008)
Inflation	0.002 (0.002)	-0.002* (0.001)	0.004* (0.002)	0.000 (0.002)	-0.001 (0.001)	0.006** (0.003)
GDPPC	0.017*** (0.006)	0.005* (0.003)	0.002 (0.004)	0.011 (0.010)	0.007 (0.005)	0.006 (0.006)
FDI	0.000 (0.001)	0.001 (0.001)	0.002 (0.003)	-0.001 (0.002)	0.001 (0.002)	0.002 (0.002)
FINOPEN	0.001 (0.002)	0.000 (0.001)	-0.003 (0.002)	-0.001 (0.002)	-0.001 (0.001)	-0.004 (0.003)
L.fd_fmd	0.885*** (0.041)			0.905*** (0.084)		
L.fd_fma		0.989*** (0.014)			0.960*** (0.034)	
L.fd_fme			1.073*** (0.046)			1.061*** (0.088)
Constant	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.080 (0.050)	-0.161** (0.070)
Observations	1,165	1,165	1,165	902	902	902
No. of Countries	77	77	77	61	61	61
Time Fixed Effects	YES	YES	YES	YES	YES	YES
Instruments	41	54	42		54	42
AR (1)	0.000	0.000	0.001	0.000	0.005	0.015
AR (2)	0.258	0.339	0.446	0.698	0.449	0.188
Hansen Test	0.220	0.763	0.249	0.168	0.186	0.370

This table presents the results on the estimates of ownership structure of oil revenues on financial markets using system GMM for period 1990-2015. L. fd\_fid is the lagged of financial markets depth; L. fd\_fia is lagged of financial markets access and L. fd\_fie is the lagged of financial markets efficiency. The standard errors are clustered at country level in the parenthesis. \*\*\*, \*\* or \* for significance level of 1%, 5% and 10% respectively.

development of the financial markets in oil-producing countries.

### 1.8. Robustness

The democracy variable describes whether a country is democratic (competitive elections) or non-democratic (non-competitive elections) and the results for these are shown in Table A6 of the appendix. The results for political rights are reported in Table A7, whereas civil liberties, results are in Table A8 of the appendix. In general, there are some differences in the results for the key variable of interest (government and private investment of oil revenues and the respective interaction with political institutions). Firstly, the evidence using democracy as the political institution variable shows a threshold effect for government investment based on the access dimension of financial institutions contrary to what was found (threshold effect was on efficiency) using executive constraint. In the case of financial market development, the key result of interest is consistent with the main result of the study, which is based on the executive constraint. Moreover, the results reveal a threshold effect of private investment through only the access dimension of financial institutions relative to the main results where the study finds a threshold effect for both depth and access. Furthermore, there is evidence of the threshold effect of private investment through the depth dimension of financial market development, and this is not the case for the results from the executive constraint.

Secondly, the evidence from the other two measures of the political institutions shows that a threshold effect of government investment by means of the access dimension instead of the efficiency dimension based on the main results from the executive constraint. In the case of private investment, the results reveal a threshold effect through the depth of the financial market for both political rights and civil liberty. Furthermore, there is evidence of a threshold effect for political rights by the efficiency dimension of financial market development, contrary to the evidence from executive constraint results. These differences in results indicate that the measures of political institutions matter on the relationship between ownership structure of oil revenues and financial markets development. More importantly, different proxies for political institutions capture different aspects of the political economy which is necessary for financial development.

**Table A6**  
Oil Revenues, Democracy and Financial Markets Development.

Variables	Depth Financial Institutions	Access	Efficiency	Depth Financial Markets	Access	Efficiency
GOR	-0.020*** (0.005)	-0.020*** (0.007)	-0.0104 (0.009)	-0.038*** (0.011)	0.0004 (0.010)	-0.015 (0.018)
Dem <sub>t-1</sub>	0.008 (0.012)	0.071*** (0.020)	0.050** (0.020)	-0.024 (0.022)	-0.028* (0.017)	-0.131*** (0.049)
GOR*Dem <sub>t-1</sub>	0.004 (0.007)	0.017** (0.009)	0.022** (0.011)	0.013 (0.011)	-0.008 (0.010)	0.005 (0.024)
POR	-0.008 (0.008)	-0.050*** (0.009)	-0.016 (0.011)	0.053*** (0.012)	0.008 (0.010)	0.027 (0.019)
POR*Dem <sub>t-1</sub>	0.003 (0.009)	0.065*** (0.011)	0.045*** (0.014)	-0.032** (0.014)	-0.015 (0.011)	-0.033 (0.025)
School	-0.016 (0.011)	-0.010 (0.017)	0.025 (0.020)	-0.147*** (0.021)	-0.104*** (0.019)	0.009 (0.036)
Inflation	0.004** (0.002)	-0.0004 (0.002)	-0.001 (0.002)	0.004 (0.004)	0.002 (0.003)	0.020*** (0.007)
GDP Per Capita	0.063*** (0.009)	0.162*** (0.019)	0.083*** (0.019)	-0.028 (0.020)	-0.059*** (0.018)	-0.127*** (0.034)
FDI	0.002 (0.001)	0.0038* (0.002)	-0.007*** (0.002)	0.007** (0.003)	0.009*** (0.003)	0.017*** (0.005)
FINOPEN	0.007*** (0.002)	0.022*** (0.003)	0.010*** (0.003)	0.016*** (0.004)	0.005 (0.004)	0.006 (0.009)
Constant	-0.524*** (0.086)	-1.215*** (0.173)	-0.172 (0.171)	0.643*** (0.197)	0.767*** (0.168)	0.950*** (0.308)
Observations	1,218	1,218	1,218	1,218	1,218	1,218
R-squared	0.978	0.942	0.816	0.903	0.929	0.794
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

This table present estimates on impact of ownership structure of oil revenues and financial institutions and markets and the intermediating role of democracy for the period 1990-2015. Dem<sub>t-1</sub> is the lag of democracy. GORDem<sub>t-1</sub> is the interaction between the share of government oil revenue and democracy, PORDem<sub>t-1</sub> is the interaction between the share of private oil revenue and democracy. All other variables' definitions remain as those reported in the main text. This can be seen in OTables 3 and 4 of the main work. The standard errors are clustered at country level in the parenthesis. \*\*\*, \*\* or \* for significance level of 1%, 5% and 10% respectively.

### 1.9. Conclusion and policy implications

This study draws from the previous literature that argues that natural resource revenues may lead to a "financial curse" because of its abundance. Also, abundance of natural resources may create weaker contracting institutions that help the ruling class to benefit at the expense of most of the citizens, causing low financial institutions and markets development. Previous studies on this theme show that natural resource revenues tend to hurt financial development in countries with weak political institutions, whereas the effect is positive in countries with strong political institutions. This among other things suggest a threshold effect of natural resource revenues on financial development, where the threshold is driven by the quality of political institutions (see [Bhattacharyya and Hodler, 2014](#); [Dwumfour and Ntow-Gyamfi, 2018](#); [Khan et al., 2020](#); [Kassouri et al., 2020](#); [Mlachila and Ouedraogo, 2020](#)). Others like [Beck et al. \(2003\)](#) show that the endowment theory influences the quality of political institutions, and this place a role in the effect of natural resources on financial development.

This study investigates how the ownership structure of oil revenues influences the development of financial markets and institutions by using data from 82 oil-producing countries. The study considers political institutions as a conduit through which oil revenues investment influences financial markets and institutions. The study uses Panel Vector Autoregressive (PVAR) model to determine the proportion (share) of oil revenues owned by both government and IOCs. The study uses the fixed-effects and two-step GMM to estimate the results for 82 oil-producing countries for the period 1990–2015.

The results from the main model specification shows that the effect of government ownership of oil revenues for investment is negative on efficiency of financial institutions. It reduces the efficiency of financial institutions at weak executive constraints, whereas it increases the efficiency of financial institutions when there are limitations on the executive (strong executive constraints). Similarly, private oil revenue investment shows that weak political institution reduces IOCs' investments in the domestic economy that affect financial institutions' access and depth, while strong political institutions have the reverse effect of IOCs' investment on financial institutions' access and depth. The study reports similar findings when the sample is limited to developing countries. We conclude that, the quality of political institutions in the form of executive constraint matters on how the ownership structure of oil revenues impacts financial institutions' development. Furthermore, it highlights which dimension of financial institution's development (depth, access, and efficiency) each of the components of the ownership structure of oil revenues (government and private investments) impacts.

On the contrary, using financial markets measures, the study finds no threshold effect of government oil revenues investment on financial markets in the full sample. Thus, executive constraints do not enhance government ownership of oil revenues for investment on the financial market's depth, access and efficiency. For private ownership of oil revenues for investment, the study finds no threshold effect on financial market development in the full sample. However, there is evidence of a positive and significant effect on

**Table A7**  
Oil Revenues Political Rights and Financial Markets Development.

Variables	Depth Financial Institutions	Access	Efficiency	Depth Financial Markets	Access	Efficiency
GOR	-0.016*** (0.004)	-0.019*** (0.006)	-0.012 (0.008)	-0.036*** (0.009)	-0.009 (0.009)	-0.026* (0.015)
PR	0.005 (0.013)	0.051** (0.021)	0.068*** (0.021)	-0.027 (0.021)	-0.014 (0.017)	-0.061 (0.049)
GOR*PR <sub>t-1</sub>	0.0005 (0.007)	0.019* (0.010)	0.029** (0.011)	0.005 (0.011)	0.003 (0.009)	0.006 (0.025)
POR	-0.009 (0.006)	-0.038*** (0.008)	0.0007 (0.011)	0.050*** (0.010)	0.010 (0.009)	0.039** (0.016)
POR*PR <sub>t-1</sub>	0.005 (0.008)	0.053*** (0.011)	0.017 (0.014)	-0.033*** (0.013)	-0.019* (0.010)	-0.058** (0.024)
Education	-0.017 (0.011)	-0.009 (0.017)	0.018 (0.021)	-0.154*** (0.021)	-0.107*** (0.019)	-0.006 (0.036)
Inflation	0.004** (0.002)	-0.0004 (0.002)	-0.0007 (0.002)	0.004 (0.004)	0.003 (0.003)	0.020*** (0.007)
GDP Per Capita	0.062*** (0.009)	0.154*** (0.019)	0.076*** (0.019)	-0.019 (0.020)	-0.052*** (0.018)	-0.114*** (0.032)
FDI	0.002 (0.001)	0.004* (0.002)	-0.007*** (0.002)	0.007** (0.003)	0.009*** (0.003)	0.016*** (0.005)
FINOPEN	0.007*** (0.002)	0.023*** (0.003)	0.010*** (0.004)	0.017*** (0.004)	0.006 (0.004)	0.006 (0.009)
Constant	-0.508*** (0.086)	-1.123*** (0.167)	-0.081 (0.166)	0.587*** (0.193)	0.700*** (0.167)	0.797*** (0.299)
Observations	1,224	1,224	1,224	1,224	1,224	1,224
R-squared	0.978	0.941	0.813	0.901	0.928	0.790
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

This table present estimates on impact of ownership structure of oil revenues and financial institutions and markets and the intermediating role of political rights for the period 1990-2015. PRt-1 is lag of political rights. GORPRt-1 is the interaction between the share of government oil revenue and political rights, PORPRt-1 is the interaction between the share of private oil revenue and political rights. All other variables' definitions remain as those reported in the main text. This can be seen in Tables 3 and 4 of the main work. The standard errors are clustered at country level in the parenthesis. \*\*\*, \*\* or \* for significance level of 1%, 5% and 10% respectively.

the depth of financial markets. This means that although the quality of political institutions does not influence the impact of private ownership of oil revenues for investment on financial market development, nonetheless, private ownership of oil revenues for investment has a direct positive influence on financial market development. However, the narrative is quite different from that of the developing countries subsample. In developing countries, substantial limitations on the executive enhances financial markets depth and access. This gives the IOCs the leverage to keep their oil funds in the local stock markets since their investment gives them more return than advanced economies with a similar political risk level.

With policy implications, political institutions are good indicators in helping to resolve the negative effect that government and private investment of oil revenues may have on financial institutions. This means that oil-producing countries should develop their institutions to help them address the financial-curse so that IOCs do not take advantage to repatriate their profit to parent companies since strong political institutions serve as a motivating factor for IOCs to retain their money in the local financial markets. Additionally, oil-producing countries need to work hard to improve upon the depth of their financial institutions and markets since investment by government and IOCs are not proving to be efficient in developing the sector. Regulators in the financial sector of those countries need to put in place adequate financial innovation policies to improve the depth of their financial system so that they can take advantage of oil revenue investments by the government and IOCs for financial system development.

The few limitations of the current study are highlighted as follows: Firstly, the study has not been able to investigate the role of political institutions in oil-rentier states and net oil-exporting countries. This is because the sample consists of all oil-producing countries both net oil-exporting and net oil-importing countries. Future studies should concentrate on net oil-exporting countries. Secondly, the volatility of government or private ownership of oil revenues for investment is of interest to researchers and policy-makers since this can help to explain the business cycle effects of oil revenue volatility on financial development. Thirdly, the IOCs oil-wells investments in weak states and how that influences financialization is of interest to academia and policymakers and this can be explored in future research.

## Data Availability

Data will be made available on request.

## Appendix

See Appendix [Table A1](#), [Table A2](#), [Table A3](#), [Table A4](#), [Table A5](#), [Table A6](#), [Table A7](#), [Table A8](#)

**Table A8**  
Oil Revenues, Civil Liberties, Financial Markets Developments.

Variables	Depth Financial Institutions	Access	Efficiency	Depth Financial Markets	Access	Efficiency
GOR	-0.020*** (0.005)	-0.033*** (0.006)	-0.011 (0.009)	-0.041*** (0.009)	-0.015* (0.009)	-0.034** (0.016)
Civil <sub>t-1</sub>	0.020* (0.011)	0.058*** (0.015)	0.050*** (0.018)	-0.029 (0.018)	0.028 (0.021)	-0.080** (0.040)
GOR*Civil <sub>t-1</sub>	0.007 (0.006)	0.031*** (0.008)	0.015 (0.011)	0.012 (0.010)	0.018* (0.010)	0.020 (0.019)
POR	-0.006 (0.006)	-0.019** (0.007)	-0.002 (0.008)	0.042*** (0.009)	0.005 (0.007)	0.032*** (0.012)
POR*Civil <sub>t-1</sub>	0.002 (0.008)	0.023** (0.011)	0.037*** (0.014)	-0.028** (0.014)	-0.015 (0.010)	-0.073*** (0.026)
School	-0.015 (0.010)	-0.005 (0.017)	0.025 (0.021)	-0.158*** (0.021)	-0.107*** (0.019)	-0.019 (0.035)
Inflation	0.004** (0.002)	-3.41e-05 (0.002)	-0.001 (0.002)	0.0048 (0.004)	0.003 (0.003)	0.021*** (0.007)
GDP Per Capita	0.061*** (0.008)	0.154*** (0.018)	0.077*** (0.019)	-0.013 (0.020)	-0.051*** (0.018)	-0.101*** (0.031)
FDI	0.002* (0.001)	0.004* (0.002)	-0.008*** (0.002)	0.007*** (0.003)	0.009*** (0.003)	0.017*** (0.005)
FINOPEN	0.007*** (0.002)	0.022*** (0.003)	0.010*** (0.003)	0.016*** (0.004)	0.005 (0.004)	0.005 (0.009)
Constant	-0.519*** (0.082)	-1.154*** (0.165)	-0.120 (0.167)	0.566*** (0.200)	0.661*** (0.167)	0.774*** (0.293)
Observations	1,224	1,224	1,224	1,224	1,224	1,224
R-squared	0.978	0.940	0.814	0.902	0.928	0.792
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

This table present estimates on impact of ownership structure of oil revenues and financial institutions and markets and the intermediating role of civil liberties for the period 1990-2015. Civil-1 is a lag of Civil liberties. GORPRT-1 is the interaction between the share of government oil revenue and civil liberties, PORPRT-1 is the interaction between the share of private oil revenue and civil liberties. All other variables' definitions remain as those in the main text. This can be seen in Tables 3 and 4 of the main work. The standard errors are clustered at country level in the parenthesis.

## Appendix B

### Sample Countries

"Albania" "Algeria" "Angola" "Argentina" "Australia" "Austria" "Azerbaijan" "Bahrain" "Bangladesh" "Belarus"  
 "Bolivia" "Brazil" "Bulgaria" "Cameroon" "Canada" "Chad" "Chile" "China" "Colombia" "Congo, Dem. Rep." "Congo, Rep."  
 "Cote d'Ivoire" "Croatia" "Czech Republic" "Denmark" "Ecuador" "Egypt, Arab Rep." "Equatorial Guinea" "France" "Gabon"  
 "Georgia" "Germany" "Ghana" "Greece" "Guatemala" "Hungary" "India" "Indonesia" "Iran, Islamic Rep." "Italy" "Japan"  
 "Kazakhstan" "Kuwait" "Kyrgyzstan" "Lithuania" "Malaysia" "Mauritania" "Mexico" "Mongolia" "Morocco" "Myanmar"  
 "Netherlands" "New Zealand" "Nigeria" "Norway" "Oman" "Pakistan" "Peru" "Philippines" "Poland" "Qatar" "Romania"  
 "Russian Federation" "Saudi Arabia" "South Africa" "Spain" "Sudan" "Suriname" "Syrian Arab Republic" "Thailand" "Tri-  
 nidad and Tobago" "Tunisia" "Turkey" "Ukraine" "United Arab Emirates" "United Kingdom" "United States" "Venezuela, RB"  
 "Vietnam" "Yemen, Rep."

## References

- Acemoglu, D., Johnson, S., 2005. Unbundling institutions. *J. Political Econ.* 113 (5), 949–995.
- Adams, D., Ullah, S., Akhtar, P., Adams, K., Saidi, S., 2019a. The role of country-level institutional factors in escaping the natural resource curse: Insights from Ghana. *Resour. Policy* 61, 433–440.
- Adams, D., Adams, K., Ullah, S., Ullah, F., 2019b. Globalization, governance, accountability and the natural resource 'curse': implications for socio-economic growth of oil-rich developing countries. *Resour. Policy* 61, 128–140.
- Asif, M., Khan, K.B., Anser, M.K., Nassani, A.A., Abro, M.M.Q., Zaman, K., 2020. Dynamic interaction between financial development and natural resources: evaluating the 'Resource curse hypothesis. *Resour. Policy* 65, 101566.
- Atkinson, G., Hamilton, K., 2003. Savings, growth, and the resource curse hypothesis. *World Dev.* 31 (11), 1793–1807.
- Beck, T., 2012. Finance and oil: is there a resource curse? In: Arezki, R., Gylfason, T., Sy, A. (Eds.), *Beyond the Curse: Policies to harness the power of natural resources*. International Monetary Fund, Washington, DC, pp. 81–106.
- Beck, T., Demirgüç-Kunt, A., Levine, R., 2003. Law, endowments, and finance. *J. Financ. Econ.* 70 (2), 137–181.
- Bhattacharyya, S., 2013. Political origins of financial structure. *J. Comp. Econ.* 41 (4), 979–994.
- Bhattacharyya, S., Hodler, R., 2014. Do natural resource revenues hinder financial development? The role of political institutions. *World Dev.* 57, 101–113.
- Canh, N.P., Thong, N.T., 2020. Nexus between financialization and natural resources rents: empirical evidence in a global sample. *Resour. Policy* 66, 101590.
- Chinn, M.D., Ito, H., 2008. A new measure of financial openness. *J. Comp. Policy Anal.* 10 (3), 309–322.

- Dogan, E., Madaleno, M., Altinoz, B., 2020. Revisiting the nexus of financialization and natural resource abundance in resource-rich countries: New empirical evidence from nine indices of financial development. *Resour. Policy* 69, 101839.
- Dwumfour, R.A., Ntow-Gyamfi, M., 2018. Natural resources, financial development and institutional quality in Africa: is there a resource curse? *Resour. Policy* 59, 411–426.
- Eregha, Mesagan, 2016. Oil resource abundance, institutions and growth: Evidence from oil producing African countries. *J. Policy Modeling* 38 (3), 603–619.
- Hamilton, J.D., 1994. Time series analysis, 2, 690–696.
- Herger, N., Hodler, R., Lobsiger, M., 2008. What determines financial development? Culture, institutions, or trade. *Rev. World Econ.* 144 (3), 558–587.
- Huang, Y., 2010. Political institutions and financial development: an empirical study. *World Dev.* 38 (12), 1667–1677.
- Iimi, A., 2007. Escaping from the resource curse: evidence from Botswana and the Rest of the World. *IMF Staff Pap.* 54 (4), 663–699.
- Jiang, C., Zhang, Y., Kamran, H.W., Afshan, S., 2021. Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. *Resour. Policy* 72, 102091.
- Kassouri, Y., Altıntaş, H., Bilgili, F., 2020. An investigation of the financial resource curse hypothesis in oil-exporting countries: the threshold effect of democratic accountability. *J. Multinat. Financ. Manag.* 56, 100639.
- Khan, M.A., Gu, L., Khan, M.A., Oláh, J., 2020. Natural resources and financial development: the role of institutional quality. *J. Multinat. Financ. Manag.* 56, 100641.
- Khanna, A.A., 2017. Revisiting the oil curse: does ownership matter? *World Dev.* 99, 214–229.
- Kurronen, S., 2015. The financial sector in resource-dependent economies. *Emerg. Mark. Rev.* 23, 208–229.
- Liaquat, Z., 2019. Does government debt crowd out capital formation? A dynamic approach using panel VAR. *Econ. Lett.* 178, 86–90.
- Lof, M., Malinen, T., 2014. Does sovereign debt weaken economic growth? A panel VAR analysis. *Econ. Lett.* 122 (3), 403–407.
- Lütkepohl, H., 2005. *New introduction to multiple time series analysis*. New: Springer Science & Business Media.
- Marshall, M., Gurr, T.R., & Jagers, K., 2019. *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2018*. dataset). Center for Systemic Peace. Accessed October 20, 2019.
- Mavrotas, G., Murshed, S.M., Torres, S., 2011. Natural resource dependence and economic performance in the 1970–2000 period. *Rev. Dev. Econ.* 15 (1), 124–138.
- Mlachila, M., Ouedraogo, R., 2020. Financial development curse in resource-rich countries: The role of commodity price shocks. *Q. Rev. Econ. Financ.* 76, 84–96.
- Mohammed, J.I., Karimu, A., Fiador, V.O., Abor, J.Y., 2020. Oil revenues and economic growth in oil-producing countries: the role of domestic financial markets. *Resour. Policy* 69, 101832.
- Ross, M., 2006. Is democracy good for the poor? *Am. J. Political Sci.* 50 (4), 860–874.
- Sahay, R., Cihák, M., N'Diaye, P., Barajas, A., Bi, R., Ayala, D., & Sviryzdenka, K. (2015). *Rethinking financial deepening: stability and growth in emerging markets*, IMF Staff Discussion Note 15/08 Washington. International Monetary Fund (May).
- Sviryzdenka, K., 2016. *Introducing a new broad-based index of financial development*. International Monetary Fund.
- Ullah, S., Akhtar, P., Zaefarian, G., 2018. Dealing with endogeneity bias: the generalized method of moments (GMM) for panel data. *Ind. Mark. Manag.* 71, 69–78.
- Umar, M., Ji, X., Mirza, N., Rahat, B., 2021. The impact of resource curse on banking efficiency: evidence from twelve oil-producing countries. *Resour. Policy* 72, 102080.
- van der Ploeg, F., 2011. Natural resources: curse or blessing? *J. Econ. Lit.* 49 (2), 366–420.
- van der Ploeg, F., Venables, A.J., 2011. Harnessing windfall revenues: optimal policies for resource-rich developing economies. *Econ. J.* 121 (551), 1–30.