Natural resources, quality of institutions and entrepreneurship activity

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ABSTRACT

It is well-established that entrepreneurs are agents of change if natural resources are exploited and used judiciously. While entrepreneurial activities may foster the accumulation of resource rents, the quality of institutions matters in this matrix of relationships. Therefore, research on natural resource availability and entrepreneurship has been consolidated over the last decade. However, the evidence on the role of institutional quality in facilitating entrepreneurship across countries with different resource endowments remains limited. Thus, we investigate the natural resource-institutions-entrepreneurship nexus using The World Bank data portals—the Worldwide Governance Indicators, World Development Indicators, Doing Business Database and the Global Entrepreneurship Monitor data from 2006 to 2015. We use a mix of estimation strategies, accounting for potential endogeneity and managing autocorrelation across panels. To a large extent, we find resource rent to increase the quality and growth of business formation in sub-Saharan Africa. More importantly, we observe a significant and positive synergy effect of the quality of institutions in the relationship between natural resource rent and business formation. Our contribution to resource policy is twofold. First, we examine the effect of a rise in natural resource rent on entrepreneurial activity using the context of sub-Saharan Africa– a region rich in natural resources. Second, we demonstrate that facilitating institutional quality in a country will also shape how the availability of natural resources affects entrepreneurial activity. Our findings provide policy and managerial implications.

1. Introduction

Natural resources are valuable assets for entrepreneurial activities (Sanjeev & Prasad, 2018; Grande et al., 2011; Sophia et al., 2004). Entrepreneurship is considered one of the fundamental drivers of economic progress and, thus, an effective tool for growth in emerging or developing countries (Baumol, 1968; Schumpeter, 1965; Munoz et al., 2019; Soluk *et al.*, 2021; Galindo-Martín et al., 2021). However, entrepreneurship becomes a catalyst for economic growth when institutions are strong (Groşanu et al., 2015; Chowdhury et al., 2019). Valuable insight from the literature suggests that the institutional structure conducive to entrepreneurial activities to take off is contingent on an array of factors, including the country's level of economic development and entrepreneurial opportunity and capability perception (Acs et al., 2008). Since entrepreneurship is considered a powerful lever in fighting poverty and spurring development (Si et al., 2020; Belitski et al., 2021), there remains an ambiguous link between natural resources and entrepreneurship (Canh et al., 2021; Munemo, 2021). However, prior studies show that the existence or non-existence of an entrepreneurial class before the resource boom affects how natural resource impacts entrepreneurship. If sizable and plentiful, the entrepreneurial class can attract investment from the resource boom and avoid the resource curse. This hypothesis stems from the theoretical stipulations of Baland and Francois (2000), who claim that the effects of natural resources on entrepreneurship are mainly determined by the nature of the equilibrium prevailing in the country when resources began to expand. Consequently, nations that suffer a deterioration in the level of entrepreneurship following a boom are those that hitherto had a low fraction of entrepreneurs prior to the boom. Implicitly, this notion posits that the development of non-resource sectors before the boom can influence the motivation of individuals regarding entrepreneurial activities after a resource boom (Omgba, 2009; Djimeu and Omgba, 2019).

Subsequently, studies that emerge from a rent-seeking perspective explicitly affirm that the natural resource boom impairs

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entrepreneurship (Murphy et al., 1993; Majbouri, 2016; Chambers and Munemo, 2019a). Rent-seeking is a harmful anomaly described as "the use of resources to secure rents derived from natural resource extraction" (Munemo, 2021). Rent-seeking activities are resource-consuming redistributive behaviours that are disruptive and unproductive, characterised by high profits. Murphy et al. (1993) argue that a rise in rent-seeking behaviours (both public and private) makes rent-seeking more desirable than productive work. Additionally, rent-seeking behaviours flourish when a country's rents are centred in small areas of the economy susceptible to expropriation and corruption or when law enforcement is ineffective and bureaucratic hurdles are elevated (Krueger, 1974; Murphy et al., 1993).

The concept of rent-seeking is connected to the new institutional economics hypothesis, which suggests that extractive practices are intricately associated with extractive institutions, which have previously been linked with poor economic conditions (Acemoglu, 1995; Mehlum et al., 2006b; Menaldo, 2016). The combination of natural resource wealth and weak institutions prevents individuals from participating in productive activities that create wealth. Indeed, Mehlum et al. (2006a and b) reveal that institutions that are *'grabber-friendly'*, as opposed to institutions that are *'producer-friendly'*, tend to be of poor quality because they permit corruption, promote the weak rule of law, and encourage other types of bad governance (Chambers and Munemo, 2019a). As a result, they damage producers by stimulating rent-seeking behaviour and redirecting resources away from more productive activities. This concept is also exemplified in the 'voracity effect' (Lane and Tornell, 1996; Tornell and Lane, 1999). When the coercive push of government encourages the transfer of productive resources (via tax policies, larceny, bribery, nationalisation and other rent-seeking behaviours) to some selected and elite interest groups, the capital stock plummets, thereby reducing entrepreneurial opportunities.

Hence, the significance of institutions in driving entrepreneurial activities cannot be overlooked (Lv et al., 2021; Chowdhury et al., 2019) since they enhance the returns to entrepreneurship over rent-seeking (Farhadi et al., 2015; Chambers and Munemo, 2019b). Explicitly, good institutions advocate that resources are shifted from being expropriated to more productive entrepreneurs and through this, entrepreneurial activities are further prompted. A limited number of empirical analyses on natural resources and entrepreneurship nexus attest to this. For example, a study of 80 countries from 2004 to 2009 shows that total reliance on resource rents decreases entrepreneurial activities (Farzanegan, 2014). The study further highlights that this reducing effect is more pronounced in countries with vast deposits of point-source resources such as oil and coal.

Also, in a panel study of 116 countries from 2001 to 2012, evidence showed that countries with high-level resource extraction experienced lower entrepreneurial activity. However, this destructive occurrence is considerably minimised and even reversed in countries with strong institutional quality (Chambers and Munemo, 2019a). Moreover, a study by Munemo (2021) on resource rents and entrepreneurship nexus, while using 28 countries in Africa, shows that the relationship between natural resources and entrepreneurship follows a Kuznets curve for countries with resource rents exceeding 30% of GDP experiencing lower levels of entrepreneurial activity. Nevertheless, there remains a paucity of studies on how institutional quality may affect the relationship between a country's specialisation in resources and the rate of entrepreneurial activity.

Consequently, the role of institutional contexts in the relationship between a country's natural resource rent and various entrepreneurship activities has remained understudied in the entrepreneurship and natural resources literature. For us to fill this critical gap in the literature, we ask the following research question: *How does an increase in natural resource rent affect entrepreneurial activities, and what is the role of institutional quality in this relationship?*

Using a sample of countries in sub-Saharan Africa, we demonstrated that it is also essential at what level of institutional development matters for the relationship between natural resource rent and business formation. The lower the level of development of institutions – the more entrepreneurs will benefit from its improvement, unlike in countries with a higher level of institutional development. Our study shows that resource curse lowers entrepreneurship activity in developing countries. At the same time, it may also intensify entrepreneurship as a rent-seeking activity in countries with a low-quality institutional environment (e.g. SSA). In addition, the moderating effect of institutions is of great policy importance as well. For instance, a positive moderation effect would imply that institutional quality reinforces the impact of resource rent on entrepreneurship in highly resource-dependent countries. If, on the other hand, the moderation effect is negative, the relationship between resource rent and entrepreneurship in developing countries would even significantly reduce entrepreneurship.

Our study significantly contributes to the resource, institution and entrepreneurship literature in numerous ways. First, it provides empirical evidence of the dynamic of natural resource rents and entrepreneurship activities and how they interact with institutional quality. This offers a better understanding of the role of institutions in promoting entrepreneurship and economic development. Second, the study provides deeper insights into the complex relationship between natural resource rent, entrepreneurship activities and formal institutions. Consequently, what emerges can inform policymakers and practitioners on how best to promote and foster entrepreneurship in resource-rich countries. Third, the study enhances the literature by underscoring the significance of institutional quality in resource-rich economies and its effect on economic development. Lastly, the findings provide avenues to develop better strategies for economic development in resource-rich countries.

The rest of the paper is organised as follows: We review relevant literature in section 2 on the context. Then, section 3 introduces our hypotheses. Section 4 describes the data and empirical strategy. Finally, section 5 presents the results, and section 6 discusses and concludes with potential policy implications and future research.

2. The context of natural resource development and entrepreneurship in developing countries

The euphoria of discovering natural resources in commercial quantities in developing economies is not new. However, most citizens see no welfare or economic benefit anymore due to a few benefiting from exploiting and exploring the resources. Since the extractive industry provides some hope, resource abundance can be used to catalyse the much-needed economic transformation (Ahali and Ackah, 2015; Sini et al., 2022; Zhou et al., 2022). Unfortunately, most middle and low-income countries endowed with discoverable natural resources (oil, gas, copper, ore) in commercial quantities appear to have mismanagement problems and poor economic leverage despite the colossal rents from natural resources. As a result, economic growth in these economies tends to be sluggish compared to their less resource-endowed counterparts. A classic example of resource-rich economies that have suffered poor resource management includes oil-rich countries such as Angola, Chad, Nigeria, Sudan, Sierra Leone, Venezuela, and DR Congo, with vast solid mineral deposits. In simple terms, the resource-rich countries mentioned above have not been successful compared to their Asian Tiger (Korea, Taiwan, Hong Kong, and Singapore) counterparts, deficient in natural resource wealth. Nonetheless, it is worth mentioning that countries such as Australia, Botswana and Norway have performed exceptionally as they have used and continue to use their natural resources for economic transformation. Nonetheless, only a few countries have achieved these successes, indicating that resource mismanagement still plagues several resource-rich countries.

One explanation that stands out is the effect of the "Dutch Disease", whereby an exchange rate over-valuation triggered by a sudden boom in natural resources leads to a decline in competitiveness with other cascading effects such as de-industrialisation (Sachs and Warner, 2001;

Corden, 1984; Harding and Venables, 2010; Ismail, 2010; Brahnbhatt et al., 2010). In addition, some studies show that the sudden discovery of natural resources within an economy tends to be a curse because of the crowd-out effects on human capital, such as education and investment in physical capital (Gylfason, 2001; Gylfason and Zoega, 2006). Also, Badeeba et al. (2017) postulate a negative correlation between natural resources and variables closely connected to economic growth indicators. Papyrakis (2017), on the other hand, shows that natural resource abundance has negative consequences on human development indices and sustainability indicators. Collier (2017), to this end, highlights another transmission effect of the resource curse, alluding that the phenomenon occurs because of psychological biases and their interaction with resource discoveries.

The puzzling occurrence of the resource curse can also be explained based on resource rents obtained because of the resource boom that creates an avenue for pillage and rent-seeking activities within the economy (Canh et al., 2021; Munemo, 2021), which may inhibit economic and entrepreneurial aspirations (Canh et al., 2021).

What ensues is that entrepreneurship is crowd-out as resources are redirected away from productive activities as rent-seeking becomes more appealing. Murphy et al. (1993) underscore that one feature associated with rent-seeking is that it increases returns. It then fosters the propensity of those who engage in rent-seeking activities to have a pronounced appetite for it to the extent that it impairs entrepreneurial endeavours' which then has a deleterious impact on production in the economy and not the individualistic tendencies. Furthermore, Chambers and Munemo (2019) investigate the relationship between resource rents and the creation of enterprises, a study that closely relates to this current exploration. They stipulate that intense extraction of natural resources can lower entrepreneurial activities based on the quality of governance prevailing in the host country. On the other hand, Youssef et al. (2018) used an environmental Kuznets curve to show that entrepreneurship is based on the use of many chemicals, which, in some instances, have had a negative impact on the quality of the environment and thereby hampering sustainability (Gu and Zheng, 2021) in most middle and low-income economies in Africa.

From a general perspective, resource rents can negatively impact a country's long-term economic prosperity and entrepreneurial aspirations, usually when a raft of issues such as corruption, rent-seeking, weak political institutions, and civil conflicts support it. Typically, policymakers in resource-rich countries, particularly in sub-Saharan Africa, use public sector employment and huge subventions as a redistributive instrument for 'patronage' to appease and keep political leaders in power. This is highly prevalent in resource-rich countries. Leaders in oil-rich economies use patronage for their parochial interest by retaining as many public sector employees as possible (Alesina et al., 1998; Robinson et al., 2006; Bjorvatn and Farzanegan, 2013).

Furthermore, the massive size of the endowed resource-rich economies is typically faced with a situation where oil or other resource discovery crowds out private sector investments, diminishing incentives that help establish sustainable industries and further relegates entrepreneurial activities within the economy. One of the significant contributions of our study is the empirical examination of the effect of natural resource rent on entrepreneurship using the lens of disaggregated institutional quality variables to predict the formation and growth of new businesses.

3. Hypothesis formulation

The association between resource rent and entrepreneurial activity is a top debate in extant academic literature (Gylfason, 2001; Barbier, 2005; Bjorvatn and Farzanegan, 2013). Earlier research mostly concentrated on analysing the resource curse hypothesis (Miamo and Achuo, 2022), which primarily investigates why nations with high resource rent cannot prosper economically despite huge oil discoveries. However, the results of the theoretical and empirical works are mixed and inconclusive. For instance, Chambers & Munemo (2019), using 116 countries between 2001 and 2012, found that countries that extract substantial natural resources exhibit limited entrepreneurial activity. However, Ben-Salha et al. (2019), using a sample of high-level resource-rich countries between 1970 and 2013, find evidence suggesting that natural resources are a "blessing" for growing business activity. On the other hand, other studies found limited positive effects (Chambers & Munemo, 2019; Barbier, 2005) or negative or no effects (Gylfason, 2001; Bjorvatn and Farzanegan, 2013).

The negative effect of natural resource wealth (resource mismanagement or curse) on entrepreneurship has long been argued, and several mechanisms have led to this relationship. Firstly, prior studies demonstrated that neglecting human capital is responsible for the curse on resources (Freytag and Langlotz, 2014). For example, resource-rich countries invest less in education, leading to lower economic growth in the long run (Gylfason, 2001) and the inability of individuals to identify entrepreneurial opportunities due to the lack of education.

In addition, resource specialisation may keep countries locked into a resource curse with low investment in other technologies and industries and focusing on "cashing" in on natural resources (e.g. Russian case). This lock-in resource industry effect limits the development of other sectors and creative destruction, typically associated with innovation and entrepreneurship (Stephan *et al.*, 2015). Moreover, the resource industry is very slow in adjusting to new environments and innovative products; business model flexibility is limited to economies of scale and the size of large firms, which is neither conducive for new ideas for smaller firms.

Moreover, governments and owners of natural resources who rely on resource-based industries, in the long run, are expected that the resource rent will continue to rise and that customers will continue to purchase resources such as coal, mineral, gas, and wood (Behrens *et al.*, 2007). This expectation will discourage coal, mineral, gas, and wood owners from investing in venture projects or starting new businesses. In doing so, an expectation for a rise in resource rent can prevent them from investing in other businesses and doing creative destruction of other markets, focusing on a traditional large-scale business model.

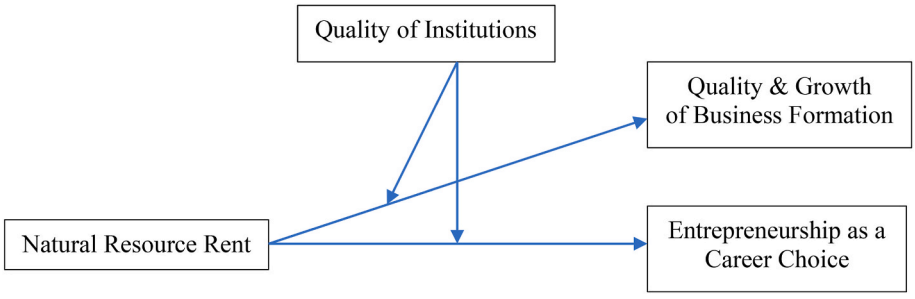

Fig. 1. ConceptualModel. Source: Authors' Concept

Consequently, from the entrepreneur's perspective, most resources are invested in industries that specialise in natural resources, dragging money away from investing in new, often more risky ventures such as entrepreneurship. Furthermore, an increase in competition and uncertainty associated with entrepreneurship activity (Audretsch and Belitski, 2021) may affect the decision of entrepreneurs to exit the market and relocate their resources to resource-rich industries encouraging rent-seeking activities with more certainty of income (Prieger *et al.*, 2016). Comparatively, corruption is a problem in resource-rich sectors and countries where owners of natural resources aim to bribe authorities to obtain licences and permits to export and take away their resources in foreign countries. In addition, multinational companies may look at corrupt authorities to enter the market and extract those resources. Altogether this issue raises the issues of poor institutional quality, which may make corruption the only tool to negotiate with the resource owners and authorities (Belitski et al. 2016). In the long run, it will affect entrepreneurial activities and aspirations (Estrin et al., 2013)

Finally, the activity of multinationals and foreign direct investment in the resource industries creates competition for the same customers and resources as entrepreneurs do (Berrill, O'Hagan-Luff, van Stel, 2020), including a hunt for talent and 'crowd out' domestic firms (De Backer and Sleuwaegen, 2003) by exploiting advanced technology and economies of scale (Ayyagari and Kosová, 2010). Moreover, as multinational firms create (well-paid) jobs, which increases the opportunity costs of entrepreneurship, the impact of resource rents on entrepreneurship may be negative, as in the case of opportunity costs created by incumbents and entrepreneurs (Kher et al., 2012). Negative effects between natural resource rent and entrepreneurship are often reported in emerging and developing markets (Sabirianova et al., 2005). These arguments are consistent as we hypothesise that:

Hypothesis 1. A country's natural resource rent is negatively related to its rate of entrepreneurship.

3.1. Institutional quality and entrepreneurship

The role of formal institutions and policies in the resources–growth nexus is extensively discussed (Mehlum et al., 2006b; Brunnschweiler and Bulte, 2008; Brunnschweiler, 2008; Iimi, 2007; Kolstad and Wiig, 2009; Arezki & van der Ploeg 2010). However, there is also no clarity about the role of institutions in the resource-entrepreneurship link. For example, Doytch and Epperson (2012) show that FDI positively affects entrepreneurship but only in middle-income countries, while Kim and Li (2014) conclude that the main positive impact of FDI on business creation is in regions with weak institutional support.

Institutions are embodied within the law (formal and informal), regulations, and norms (Selznick, 1949; Everett, 1939; North, 1993). These regulations consist of codes of conduct, behaviour, and relationships that develop into a complex construct, regulating human relationships and influencing companies' decision-making. North (1993) asserts that institutions are the "rules of the game" within an economy, whereas organisations and entrepreneurs become players. Scott (1994) suggests that businesses and entrepreneurial activities are characterised by institutional frameworks operating in a country. The kind of institutional framework operating in a resource-rich economy is a significant determinant as it encompasses principles hinged on regulations, norms, and constraints in formal and informal aspects regarding political, legal, and social matters. Similarly, organisations must acclimatise to the institutions' standards to gain support from society and institutions (DiMaggio & Powell 1983). So formal laws are described as explicitly articulated in written terms; a constitution is an example of formal law.

Scholars have divided institutions into three main categories based on their specific features. These dimensions are coercive, regulatory, and cultural-cognitive (Urban, 2016; Busenitz *et al.*, 2000; Scott, 2005; North, 1990). It is crucial to note that these three dimensions work concurrently within a specific context. However, their significance can differ among institutions and countries. For example, a specific cultural coercive institution may be more valid than the cognitive one, or vice versa. Similarly, Scott (2005) suggests that disparities in institutional perspectives (regulatory, normative, and cultural-cognitive) may differ in the same culture. Thus, the impact of some of them could minimise the effects of others.

North (1990) and Welter (2005) posit that the entrepreneur is a crucial factor in the transformation of society. An entrepreneur is a person who discovers new opportunities in the market and finds a way to fulfil an existing need, indicating that the opportunities that entrepreneurs foresee can become a source of change within society. Against this background, North's (1990) institutional approach considers the definition of entrepreneurship created by opportunity rather than necessity and that the actions of entrepreneurs are strongly dependent on the institutional quality of a country where entrepreneurs live and operate. Institutional quality facilitates entrepreneurship (Chowdhury et al., 2019) as it creates motives and incentives for economic activities, including productive and non-productive entrepreneurship (Baumol, 1990; Bjørnskov & Foss, 2008). Regulations as a formal institution guarantee the rules of the game for entrepreneurs. The context of institutions includes changes within an environment as well as combined changes of internal (inside a firm) and external such as society and laws (outside a firm) factors (Urbano and Alvarez, 2014; Urbano et al., 2019).

The above discussion allows us to argue that institutional context can create an environment for entrepreneurs in countries with a high level of resource specialisation that would create aspirations for entrepreneurs to start a business (Estrin et al., 2013). For example, Sobel (2008) used 22 OECD in a cross-sectional study and found that institutional quality positively and significantly affects entrepreneurial activity (Peres et al., 2018), with all these economies having high institutional quality. Furthermore, their study suggests that regulation and the size of government are the key areas of economic freedom that induce entrepreneurial entry across countries with different levels of economic development and industry specialisation activity.

In their theoretical model, Robinson et al. (2006) show that the final growth impact of resource booms is conditional on the quality of institutions. Based on their model, the lack of institutions promoting accountability and state competence is one of the principal causes of the natural resource curse and mismanagement. Institutional quality may moderate the relationship between resource rent and entrepreneurship as it leverages the mechanisms we discussed earlier, such as corruption and rent-seeking. It may lead to more entrepreneurship due to improved regulation, laws, and culture of doing business. A high institutional environment is a particularly conducive environment for knowledge spillovers to occur from multinationals. If institutions support entrepreneurs' multinational companies (MNCs) in resource-rich industries may agree to outsource their need for intermediate goods and services to local entrepreneurs, inward FDI may positively impact entrepreneurial activity.

A high-quality institution may translate into a lower risk for entrepreneurs of expropriation (Belitski et al., 2016), facilitating outsourcing of technical tasks and producing high-quality (intermediate) goods to local entrepreneurs, altogether making starting a business a lucrative opportunity to resource owners, as well as collaborate with entrepreneurs on supply and demand of intermediate goods and services. In this term, resource rents can become a catalyst used by entrepreneurs (e.g., incomes, business survival, or growth), for example, in Saudi Arabia or the Arab Emirates, where institutional quality is high. On the other hand, in a country that has produced oil for many years without robust institutions, resource rents can cause a significant problem for development and entrepreneurship. Furthermore, studies from ecological economics suggest that production and consumption are primarily linear functions of raw materials (Chambers & Munemo, 2019; Barbier, 2005).

These arguments suggest that institutional quality reinforces the positive effect of natural resource rent on entrepreneurship activity, i.e.,

a positive moderating role for a country's institutions. Furthermore, the above arguments lead to the following hypothesis.

Hypothesis 2. The relationship between a country's natural resource rent and the rate of entrepreneurship is positively moderated by a country's institutional quality.

4. Data and methodology

Our sample between 2006 and 2015 is based on the following data sources at the country level: The World Bank—The World Development Indicators (WDI), the Doing Business Database (DB), and the Worldwide Governance Indicator (WGI). In addition, we rely on the 2018 dataset from the Global Entrepreneurship Monitor (GEM) for *entrepreneurship as a career choice*, *necessity* and *opportunity* entrepreneurs.

Hence, we utilise an unbalanced panel of firms from 32 developing countries in sub-Saharan Africa between 2006 and 2015 (see Tables A5). The 2018 World Bank database contains data on comparable global entrepreneurship performance across countries, which connects to the structure of GEM. It provides data on business density per 1000 inhabitants aged 18–64 across these countries. Nevertheless, only the formal sector is covered by new business density. Since there is no data on the number of firms operating in the informal sector in some African countries, the informal sector is excluded. Also, due to the differences in definitions and regulations of other types of formal businesses, such as partnerships and sole proprietorships, the Entrepreneurship Database Project only includes firms with limited liability. The 2018 WDI provides economic growth indicators and other development indicators. The Worldwide Governance Indicators capture six crucial elements of essential institutions across countries (Kaufmann et al., 2010).

On the other hand, the 2018 GEM measures and analyses how the scale and scope of entrepreneurial activities differ across countries. GEM collects individual-level data nationwide on the antecedents and frequency of entrepreneurial activity, generating globally comparable entrepreneurship data. Thus, researchers widely use the GEM dataset in entrepreneurship studies due to its high quality and reliability, which undergoes numerous reliability checks (Reynolds et al., 2005). Moreover, data is collected using the GEM National Expert Survey, including a sample of a minimum of 4 national experts for each Entrepreneurial Framework Condition (EFC). Of the national experts, at least one-quarter must be running an established or new business, and one-quarter must not have participated in the previous year. Data are matched across countries over the period 2006–2015. As a result, indices vary over time within and across countries and a time-series variation within countries. We used a country indicator to match the dataset. We also sort the data sources by country to ensure a significant level of convergence.

4.1. Variable description and measurements

4.1.1. Dependent variable

4.1.1.1. Start-up density. As the outcome variable, entrepreneurship is measured by the density of new businesses, which is the number of firms with limited liability registered per 1,000 working-age adults (ages 15–64). In 155 economies, the Entrepreneurship Database Project measures domestic entrepreneurship using new business density, with data compiled from the World Bank. To measure this outcome variable, we express it as a logarithm of the difference, representing the growth and quality of business formation. Some studies have used this indicator to measure entrepreneurship activities (Parker, 2009; Stenholm et al., 2013; Munemo, 2021). We also use entrepreneurship as a career choice as a dependent variable for our robustness checks (Thébaud, 2010; Tomski, 2014).

4.1.2. Independent variables

4.1.2.1. Natural resource rents. Natural resource rent is measured as the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents as a share of a country's GDP from the World Bank (Kalyuzhnova and Belitski, 2019). Natural resource rent or resource rent indicates a country's resource specialisation as to its gross domestic product (World Bank, 2021). In this study, we utilise total resource rents as a percentage of GDP as our primary independent variable. This choice is based on two reasons. Firstly, as Ross (2008) notes, resource rent-to-GDP is closely linked to a nation's economic size. Secondly, natural resource rents-to-GDP have been widely used in the discourse on the paradox of plenty (Ebeke et al., 2015; Kamguia et al., 2022) and specifically in studies examining its relationship with productive entrepreneurship (Chambers and Munemo, 2019a; Munemo, 2021; Awoa et al., 2022b).

4.1.3. Institutional quality variables (Moderators)

Data on institutional quality are from the World Bank's Worldwide Governance Indicators (WGI) database. The procedure used to collect the data is explained by Kaufmann et al. (2010). The indicators are our moderators: *freedom from corruption*, *government effectiveness*, *political stability*, *regulatory quality*, *rule of laws* and *voice & accountability*.

4.1.4. Control of corruption

This measures how a country uses power, not for private gains, including petty and grand forms of corruption. The reverse of this construct, indicating how a country uses its public power for private benefit, is also used to predict the same relationship in our analysis. Some studies have used related measures (Chamber & Munemo, 2012; Asongu et al., 2018; Munemo, 2021). All institutional variables are measured on a scale of −2.5 to 2.5, indicating weak institutions (−2.5) at the left extreme and strong institutions (2.5) at the right extreme.

4.1.5. Government effectiveness

Based on the Worldwide Governance Indicator (WGI) database, the government effectiveness indicator assesses people's perceptions regarding the calibre of public services, the independence level of the civil service from political influences, the quality of policy formulation and implementation, and the government's trustworthiness in fulfilling its commitments towards these policies. Government effectiveness plays a crucial role in the emergence, development, and growth of entrepreneurship (Friedman, 2011; Audretsch et al., 2019; Chowdhury et al., 2019; Audretsch and Belitski, 2021). Williamson's institutional framework's third phase underlines governance as the primary channel for resource distribution. Thus, the growth and quality of entrepreneurs in an economy primarily rely on the effectiveness of governance and how resource allocation reaches this aspect of business growth.

4.1.6. Political stability

The overall political stability in a country is vital for economic growth. A politically stable economy provides a good atmosphere stimulating economic development (Law et al., 2013). A country with a stable and democratic system of governance creates a good market-based financial structure. The effectiveness of political institutions when examining natural resource rent and entrepreneurial activity can help ameliorate any political threat that may ensue and attain stable economic growth (Mercado, 2019). The WDI database measures the likelihood that a government may not be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism, i.e., ranging from approximately −2.5 to 2.5. Prior studies find that political institutions affect the innovative outcome when a set of laws, policies, norms, and infrastructure are developed (Olstrom, 1990; Edquist, 1997; Spencer *et al.*, 2005). We argue that the quality of political institutions could help facilitate wealth

creation and sustainability in different socio-economic phases.

4.1.7. Regulatory quality

Nations' formal regulatory institutions and quality are fundamental since they can reduce the uncertainty and hazard of entrepreneurial activities (Smallbone & Welter, 2012; Chowdhury et al., 2019). However, these institutions can also impact entrepreneurial activities adversely if the cost associated with regulation compliance is high (Klapper et al., 2006). The variable captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development while adhering to sustainability issues. It estimates a country's score on the aggregate indicator in units of standard normal distribution, i.e. ranging from approximately −2.5 to 2.5. Asongu et al. (2018) and Chambers & Munemo (2019) demonstrated that this indicator is essential in strengthening entrepreneurial emergence and development.

4.1.8. Rule of laws

The rule of law from the world bank captures perceptions of the extent to which agents have confidence in arbitration and abide by the rules of society, including the quality of contract enforcement, property rights, the police, courts, and the likelihood of crime and violence. This indicator ranges from −2.5 to 2.5. A strong rule of law strengthens shared trust and minimises uncertainty and operating costs. This fosters production, attracts fast-growing firms, and lets them operate on a bigger scale over a longer period (Mickiewicz et al., 2019; Estrin et al., 2013; Rodrik, Subramanian &Trebbi, 2004). Moreover, when the rule of law is strongly applied, prospective entrepreneurs can identify the risks associated with rent-seeking and expropriation and, to a large extent, can avert corruption (Goltz et al., 2015; Levie & Autio, 2011).

Table 1
Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
New bus density growth rate (diff in logs of new bus density)	22273	-.01	.181	-.44	1.993
Entrepreneurship as a career choice	22273	4.289	18.617	0	88.254
Necessity entrepreneurs	22273	16.537	16.205	0	44.996
Opportunity entrepreneurs	22273	38.838	38.022	0	85.541
Natural Resource Rents	22273	17.261	16.004	.012	77.055
Regulatory Quality	22273	-.561	.54	-1.923	.87
Control of Corruption	22273	27.612	9.47	9.8	60
Government Effectiveness	22273	-.686	.546	-1.704	.762
Political Stability	22273	-.697	.927	-2.378	.96
Rule of Law	22273	-.647	.552	-1.777	.952
Voice & Accountability	22273	-.474	.625	-1.746	.814
Employment in services (% of total employment)	22273	11.87	21.214	0	68.4
Employment in Industry (% of total employment)	22273	3.739	7.416	0	28.6
Population (logged)	22273	3.987	.069	3.863	4.251
GDP (logged)	22273	3.084	.393	2.22	3.881
Trade (% of GDP)	22273	66.888	33.119	0	188.98
Property rights (logged)	22273	3.36	.696	0	4.263
Agriculture value added (% of GDP)	22273	22.344	12.561	0	57.319
Government spending	22273	73.924	16.514	0	97.2
tertiary education (% of gross enrolment)	22273	5.48	4.266	0	19.08
Extent crime imposes cost on business	22273	3.034	.945	.62	5.3
Procedures for business registrations	22273	9.43	2.62	3	17
Domestic credit to private sector (% of GDP)	22273	22.226	30.039	0	160.125

Table 2
Pairwise correlations of estimation Variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Log_diff business formation	1.000																				
Entrepre. as a Career choice	0.105***	1.000																			
Natural Resource Rent	-0.019***	-0.172***	1.000																		
Control of Corruption	0.052***	0.402***	-0.197***	1.000																	
Government effectiveness	0.076***	0.428***	-0.356***	0.827***	1.000																
Political stability	0.101***	0.134***	-0.082***	0.594***	0.586***	1.000															
Regulatory Quality	0.011***	0.382***	-0.348***	0.798***	0.885***	0.555***	1.000														
Rule of Law	0.030***	0.363***	-0.288***	0.889***	0.889***	0.646***	0.834***	1.000													
Voice & Accountability	0.053***	0.396***	-0.390***	0.652***	0.718***	0.510***	0.707***	0.726***	1.000												
Employment Services	-0.043***	0.264***	-0.172***	0.360***	0.447***	0.195***	0.487***	0.288***	0.403***	1.000											
Employment industry	-0.093***	0.241***	-0.212***	0.401***	0.469***	0.239***	0.544***	0.345***	0.418***	0.901***	1.000										
Population (logged)	-0.026***	0.169***	-0.215***	0.391***	0.014***	-0.050***	0.021***	-0.027***	-0.003	0.220***	0.222***	1.000									
GDP (logged)	0.007**	0.331***	-0.249***	0.256***	0.228***	0.103***	0.228***	0.097***	0.227***	0.456***	0.468***	0.662***	1.000								
Trade	0.021***	-0.177***	0.119***	0.193***	0.159***	0.414***	0.187***	0.154***	0.108***	0.143***	0.187***	0.344***	0.263***	1.000							
Property rights (logged)	-0.029***	0.301***	-0.156***	0.622***	0.388***	0.204***	0.403***	0.407***	0.381***	0.283***	0.313***	0.585***	0.414***	0.165***	1.000						
Agriculture	0.008***	-0.288***	-0.016***	-0.494***	-0.500***	-0.370***	-0.490***	-0.406***	-0.339***	-0.407***	-0.429***	0.120***	-0.183***	-0.134***	0.022***	1.000					
Government spending	0.040***	0.027***	-0.025***	-0.317***	-0.124***	-0.247***	-0.109***	-0.186***	-0.138***	-0.054***	-0.060***	0.455***	0.212***	-0.121***	0.508***	0.386***	1.000				
Tertiary education	-0.026***	0.386***	-0.222***	0.476***	0.535***	0.354***	0.555***	0.453***	0.492***	0.685***	0.691***	0.278***	0.449***	0.280***	0.307***	-0.474***	-0.155***	1.000			
Cost of crime	-0.004	0.006**	0.026***	-0.281***	-0.331***	-0.431***	-0.236***	-0.472***	-0.076***	0.116***	0.067***	-0.353***	0.079***	-0.344***	-0.100***	0.063***	0.284***	-0.287***	1.000		
Business Procedures	-0.029***	0.096***	0.035***	-0.262***	-0.175***	-0.256***	-0.286***	-0.226***	0.021***	-0.029***	-0.097***	0.373***	0.123***	-0.045***	0.176***	0.200***	0.400***	-0.050***	0.220***	1.000	
Domestic credit	-0.018***	0.271***	-0.245***	0.491***	0.514***	0.276***	0.448***	0.478***	0.259***	0.156***	0.196***	0.286***	0.236***	0.238***	0.257***	-0.293***	-0.004	0.394***	-0.248***	-0.068***	1.000

***p < 0.01, **p < 0.05, *p < 0.1.

4.1.9. Voice and accountability

V&A describes the views that citizens of a nation can choose their government, including a subset of freedom of expression, association, and media freedom, i.e. ranging from approximately −2.5 to 2.5. This measure has been used by Munemo (2012) and Asongu et al. (2018).

4.1.10. Control variables

Our models factor in a few covariates, including start-up procedures, government spending, credit from the private sector (% of GDP), and gross domestic product (GDP) obtained from the World Bank—World Development Indicator and Doing Business Databases, respectively. We also include other covariates, including employment in services and industry as a percentage of total employment, population growth, trade & agriculture value added as a percentage of GDP, tertiary education (% of GDP) and log-transformed property rights. Studies have demonstrated that these variables affect entrepreneurial activity (Chowdhury et al., 2019; Munemo, 2022). Tables 1 and 2 report the descriptive statistics and pairwise correlation matrix, while Table A1 reports the list of countries in our sample.

4.2. Empirical approach

Our study examines the effect of natural resource rent and institutions on entrepreneurial activity in developing countries using a mix of estimation strategies, including fixed effects, robust instrumental variables, and Feasible Generalised Least Squares (FGLS). Our main findings are performed with the fixed effect approach (Tables 3 and 4). When estimating the relationship between natural resource rents and business formation, the fixed effect model offers several advantages over the random effect model. Firstly, fixed effect models do not suffer from bias resulting from omitted variables that may be related to independent variables. Second, the fixed effect model can account for the potential endogeneity of natural resource rents, as it can capture the effect of within-country changes in resource rents on business formation. Third, the fixed effect model can account for the potential for unobserved heterogeneity across countries by including country-level fixed effects. Finally, the fixed effect model is less prone to bias from outliers or extreme values in the data, as it considers differences between countries.

We employ a baseline empirical model of business density as follows:

$$Y_{it} = \beta_0 + \beta_1 NRR_{it} + \beta_2 Institutions_{it} + \beta_3 controls_{it} + \varepsilon_{it} \quad (1)$$

Where Y_{it} represents the logarithm of differences in start-up density in country i in year t and the three entrepreneurship indicators used in robustness checks, entrepreneurship as a career choice, necessity and opportunity entrepreneurs. NRR_{it} represents natural resource rents in country i in year t; Institutions include a set of *government effectiveness*, *political stability*, *regulatory quality*, the *rule of law*, *voices & accountability*, and *corruption* in country i in year t. We use the fixed effects following Wooldridge et al. (2016). Confirming the choice of fixed effect strategy, we produce the Hausman test corresponding to each model in our regression tables.

Furthermore, we use interaction analysis in the fixed effect estimation to demonstrate how the relationship between natural resource rent and entrepreneurship changes at different levels of institutional quality. Equation (2) shows our adjusted model for the moderating effect of institutions. The institutional variables include government effectiveness, regulatory quality, the rule of law, political stability, freedom from corruption, pervasive corruption, and voice & accountability. We also add the level of economic development proxied by a GDP per capita (Thurik et al. 2008). Table 2 illustrates the correlations of our estimation variables.

$$Y_{it} = \beta_0 + \beta_1 NRR_{it} + \beta_2 Institutions_{it} + \beta_3 (NRR^{*} Institutions)_{it} + \beta_4 \, log\ GDP_{it} + \beta_5 controls_{it} + \varepsilon_{it} \quad (2)$$

5. Results

5.1. Results related to research hypotheses

We test our hypotheses by generating three main result tables and five other supplementary analyse. Tables 3–5 contain the primary estimations using the fixed effect and instrumental variable approach. Table 3 reports the direct effect of natural resource rent and institutions on business formation growth and quality, while Table 4 reports the interaction effects. Table 5, on the other hand, contains results from the instrumental variable approach. In the first supplementary Tables, we report estimations using entrepreneurship as a career choice as a dependent variable (Table A1). Considering the serial correlations in our estimation variables, we estimate the Feasible Generalised Least Squares approach to address the multicollinearity issues (Table A2). Table A3 contain the first stage regression for the instrumental variable regression, while Tables A4 & A5 report the pairwise correlations and list of countries in our sample. Our primary dependent variable is the log difference in start-up density.

Going by the results in Table 3, we find natural resource rents to positively predict the growth and quality of business formation in Models 1, 2, 3, 5 & 6 while controlling for each institutional variable. In Model 2, Table 3, the effect of resource rent becomes negative after introducing political stability, while the significant effect disappears in the multilevel model (M7). However, in the multilevel model, all institution variables except voice & accountability, and rule are conducive to business formation and growth. Overall, our results do not support ***H1*** as we propose that natural resource rent has a negative effect on business formation. Generally, the quality of institutions remains a fundamental tool for stimulating entrepreneurship in sub-Saharan Africa. We generally observe a positive link between natural resource rent and start-up density in SSA with poor institutions (spec. 1–6, Table 3). The findings in Table 3 (spec. 1–6) demonstrate that freedom from corruption further increases the relationship between natural resource rent and start-up density ($\beta = 0.001, p < 0.01$). Also, government effectiveness ($\beta = 0.11, p > 0.01$), regulatory quality ($\beta = 0.06, p < 0.01$); political instability ($\beta = 0.07,\ p < 0.01$), and voice & accountability ($\beta = 0.02,\ p < 0.01$).

Furthermore, we propose in our H2 that the quality of institutions should moderate the link between natural resource rents and business formation. Table 4 shows a positive and significant synergistic effect of resource rent and institutions on the quality and growth of business formation.

Our findings demonstrate that start-up activity in SSA countries positively responds to institutional quality even though it might be perceived as rent-seeking (Belitski et al., 2016). Second, the quality of start-up density may be low, given that institutional development filters out a significant number of start-ups. While we cannot control the quality of entrepreneurship directly, we argue that start-up density represents entrepreneurship's quantity (stock) rather than its growth-oriented ambition and productivity. Nonetheless, our dependent variable, to a significant extent, measures the growth and quality of entrepreneurship. Our SSA results will likely differ from those of other developing countries that might have improved institutional quality. Institutions likely facilitate the link between natural resources and entrepreneurship activity, as start-ups are closely related to working in a supply chain in large energy firms, and again in doing so, this stimulates entrepreneurship. Therefore, in SSA, there will be many rent-seeking entrepreneurs and authorities, potentially benefiting from natural resources and creating small businesses and self-employment to further-rent seek. This phenomenon could be related to some politically connected entrepreneurs (Belitski et al., 2021).

In addition, from an institutional viewpoint, the ability of a country's quality institutions to foster new business formation is essential. Therefore, institutional quality is considered a key factor in promoting

Table 3
Relationship between Resource rents and business formation (direct effect).

VARIABLES	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)
	Q of BizG	Q of BizG	Q of BizG	Q of BizG	Q of BizG	Q of BizG	Q of BizG
Total natural resources rents (% of GDP)	0.003***	0.002***	0.004***	-0.001***	0.005***	0.004***	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Resource rent squared	-0.001***	-0.001***	-0.001***	0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control of corruption	0.001***						0.004***
	(0.000)						(0.000)
Government Effectiveness		0.106***					0.214***
		(0.002)					(0.003)
Regulatory Quality			0.063***				0.093***
			(0.002)				(0.003)
Political Stability				0.068***			0.067***
				(0.001)			(0.001)
Rule of law					0.001		-0.279***
					(0.002)		(0.003)
Voices and Accountability						0.022***	-0.030***
						(0.001)	(0.002)
Employment in services (% of total employment)	0.004***	0.003***	0.004***	0.004***	0.004***	0.004***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment in industry (% of total employment)	-0.018***	-0.014***	-0.018***	-0.018***	-0.018***	-0.019***	-0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population (logged)	-0.017	-0.212***	0.001	0.058***	0.012	0.031**	-0.813***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.015)	(0.015)	(0.017)
GDP (logged)	-0.029***	-0.025***	-0.041***	-0.060***	-0.018***	-0.025***	-0.049***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Trade (% of GDP)	0.001***	0.001***	0.001***	0.000***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property rights (logged)	0.013***	-0.031***	-0.004**	-0.007***	0.028***	0.021***	-0.022***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Agriculture, value added (% of GDP)	0.001***	0.001***	0.001***	0.002***	0.001***	0.001***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Government spending	-0.000**	0.000***	-0.000***	0.000***	-0.000***	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary education enrollment, gross %	0.003***	0.005***	0.003***	0.012***	0.002***	0.002***	0.013***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
extent crime imposes cost on business	-0.015***	0.010***	-0.007***	0.024***	-0.018***	-0.012***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Start-up procedures to register a business (number)	-0.000	-0.005***	-0.001***	0.001**	-0.000	-0.000	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit to private sector (% of GDP)	0.002***	0.001***	0.001***	0.000***	0.002***	0.002***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.037	0.945***	0.051	-0.200***	-0.203***	-0.234***	3.275***
	(0.056)	(0.056)	(0.053)	(0.049)	(0.054)	(0.053)	(0.066)
Observations	22273	22273	22273	22273	22273	22273	22273
Hausman Test chi2(14)	2074.89	317.05	4015.217	2373.829	5626.385	2221.192	5051.067
P-value (Hausman test)	0.0000	0.0000	0.0011	0.0000	0.0000	0.0000	0.0000
R-squared	0.307	0.37	0.332	0.404	0.303	0.31	0.58
RMSE	0.056	0.053	0.055	0.052	0.056	0.056	0.043
Adj R^2	0.306	0.369	0.331	0.404	0.303	0.31	0.579
sigma_u	0.065	0.065	0.07	0.078	0.066	0.072	0.043
sigma_e	0.056	0.053	0.055	0.052	0.056	0.056	0.043
rho	0.573	0.595	0.623	0.694	0.583	0.626	0.492
F-stat	656.722***	869.911***	735.761***	1006.658***	646.127***	667.173***	1535.214***
ll	32668.645	33726.168	33072.525	34355.191	32613.374	32722.893	38244.3
Number of Years (with gaps)	7	7	7	7	7	7	7

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 4
Relationships between resource rents, institutions, growth & quality of business formation.

DV: New bus density growth rate (diff in logs of new bus density)							
VARIABLES	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)
Total natural resources rents (% of GDP)	-0.007***	-0.001***	-0.002***	-0.003***	-0.0001*	-0.0001	0.023***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Resource rents squared	0.000***	0.000***	0.000***	0.000***	0.000*	0.000**	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control of corruption	0.003***	0.005***	0.005***	0.006***	0.004***	0.004***	0.018***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Government Effectiveness	0.232***	0.197***	0.236***	0.252***	0.219***	0.214***	0.572***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)
Political Stability	0.061***	0.059***	0.052***	0.047***	0.052***	0.064***	0.040***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Regulatory Quality	0.083***	0.084***	0.031***	0.063***	0.081***	0.091***	-0.079***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.006)
Rule of law	-0.265***	-0.269***	-0.267***	-0.310***	-0.265***	-0.275***	-0.680***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.006)
Voices and Accountability	-0.040***	-0.030***	-0.025***	-0.044***	-0.031***	-0.042***	0.049***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Resource rent*control of corruption	0.0001***						-0.001***
	(0.000)						(0.000)
Resource rent*government effectiveness		0.003***					-0.022***
		(0.000)					(0.000)
Resource rent*regulatory quality			0.003***				0.007***
			(0.000)				(0.000)
Resource rent*rule of law				0.005***			0.037***
				(0.000)			(0.000)
Resource rent*political stability					0.001***		-0.000***
					(0.000)		(0.000)
Resource rent*voice & accountability						0.001***	-0.012***
						(0.000)	(0.000)
Employment in services (% of total employment)	0.004***	0.003***	0.003***	0.002***	0.004***	0.003***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment in industry (% of total employment)	-0.010***	-0.009***	-0.008***	-0.006***	-0.013***	-0.010***	0.009***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population (logged)	-0.943***	-0.855***	-0.896***	-1.054***	-0.831***	-0.822***	-1.574***
	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)
GDP (logged)	-0.049***	-0.048***	-0.053***	-0.042***	-0.050***	-0.043***	-0.081***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Trade (% of GDP)	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property rights (logged)	-0.053***	-0.040***	-0.049***	-0.077***	-0.033***	-0.027***	-0.101***
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Agriculture, value added (% of GDP)	0.003***	0.003***	0.002***	0.003***	0.003***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Government spending	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary education enrollment, gross %	0.014***	0.013***	0.013***	0.013***	0.014***	0.012***	0.020***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
extent crime imposes cost on business	0.000	-0.004***	-0.002*	-0.000	-0.005***	-0.007***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Start-up procedures to register a business (number)	-0.008***	-0.007***	-0.008***	-0.010***	-0.006***	-0.005***	-0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit to private sector (% of GDP)	-0.001***	-0.000***	-0.001***	-0.001***	-0.000***	-0.000***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	3.933***	3.486***	3.695***	4.364***	3.374***	3.299***	6.373***
	(0.072)	(0.067)	(0.068)	(0.070)	(0.066)	(0.066)	(0.075)
F-stat	1515.155***	1495.137***	1517.031***	1632.508***	1478.576***	1465.668***	1888.421***
F test that all u_i = 0	1747.87***	1720.25***	1798.08***	1762.71***	1670.15***	1527.41***	2882.11***
Observations	22273	22273	22273	22273	22273	22273	22273
Hausman Test chi^2(24)	11300	26500	9804.843	13200	77200	50230.66	15800.33
P-value (Hausman test)	0.0059	0.0034	0.0022	0.0000	0.0015	0.0000	0.0000
R-squared (within)	0.589	0.585	0.589	0.606	0.583	0.58	0.688
Adj R^2 (overall)	0.588	0.585	0.588	0.606	0.582	0.58	0.688
RMSE	0.043	0.043	0.043	0.042	0.043	0.043	0.037
sigma_u	0.046	0.043	0.044	0.051	0.042	0.042	0.096
sigma_e	0.043	0.043	0.043	0.042	0.043	0.043	0.037
rho	0.528	0.501	0.509	0.599	0.49	0.48	0.867
Log-likelihood	38476.457	38389.523	38484.565	38972.87	38317.089	38260.301	41566.97
Number of Years (with gaps)	7	7	7	7	7	7	7

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 5
Relationships between Resource rents, institutions, quality & growth of business formation.

Instrumental variable results New bus density growth rate (diff in logs of new bus density)							
VARIABLES	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)
Total natural resources rents (% of GDP)	-0.012***	0.002***	-0.034	0.000**	0.002***	0.001**	-0.014***
	(0.000)	(0.000)	(0.022)	(0.000)	(0.000)	(0.000)	(0.000)
Resource rent squared	0.001***	0.001***	0.002	0.001***	-0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Government Effectiveness	0.183***	0.055***	0.601**	0.136***	0.152***	0.152***	
	(0.003)	(0.017)	(0.271)	(0.005)	(0.003)	(0.003)	
Political Stability	0.056***	0.064***	-0.044	0.060***	0.058***	0.059***	
	(0.002)	(0.001)	(0.069)	(0.001)	(0.011)	(0.002)	
Regulatory Quality	0.129***	0.127***	-1.647	0.069***	0.110***	0.100***	
	(0.004)	(0.004)	(1.080)	(0.006)	(0.003)	(0.006)	
Rule of law	-0.258***	-0.208***	0.398	-0.173***	-0.223***	-0.203***	
	(0.006)	(0.006)	(0.397)	(0.013)	(0.007)	(0.012)	
Voices and Accountability	0.003*	0.003**	0.192*	-0.018***	-0.004	-0.065***	
	(0.002)	(0.002)	(0.116)	(0.003)	(0.003)	(0.016)	
Control of corruption	0.001						
	(0.000)						
Resource rent*control of corruption	0.001***						
	(0.000)						
Resource rent*government effectiveness		0.006***					
		(0.000)					
Resource rent*regulatory quality			0.055*				
			(0.032)				
Resource rent*rule of law				0.005***			
				(0.000)			
Resource rent*political stability					0.002***		
					(0.000)		
Resource rent*voice & accountability						0.006***	
						(0.001)	
Aggregated quality of institutions							-0.001***
							(0.000)
Resource rents*aggregated quality of institutions							0.000***
							(0.000)
Employment in services (% of total employment)	0.006***	0.005***	-0.002	0.005***	0.007***	0.004***	0.007***
	(0.000)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
Employment in industry (% of total employment)	-0.016***	-0.014***	0.016	-0.015***	-0.021***	-0.012***	-0.023***
	(0.000)	(0.000)	(0.018)	(0.000)	(0.001)	(0.000)	(0.000)
Population (logged)	-0.924***	-0.498***	-0.464***	-0.523***	-0.563***	-0.599***	-0.229***
	(0.021)	(0.035)	(0.112)	(0.027)	(0.016)	(0.015)	(0.017)
GDP (logged)	-0.056***	-0.060***	-0.035**	-0.056***	-0.064***	-0.009	-0.063***
	(0.003)	(0.003)	(0.016)	(0.003)	(0.002)	(0.008)	(0.004)
Trade (% of GDP)	0.001***	0.001***	-0.000	0.001***	0.000***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property rights (logged)	-0.050***	-0.024***	-0.242*	-0.047***	-0.016***	-0.024***	-0.043***
	(0.002)	(0.002)	(0.139)	(0.003)	(0.003)	(0.004)	(0.003)
Agriculture, value added (% of GDP)	0.001***	0.001***	-0.001	0.001***	0.002***	0.002***	0.000**
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Government spending	-0.001***	-0.001***	0.006	-0.001***	-0.001***	-0.001***	-0.000***
	(0.000)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary education enrollment, gross %	0.010***	0.008***	-0.001	0.008***	0.012***	0.004***	0.000
	(0.000)	(0.000)	(0.006)	(0.000)	(0.001)	(0.001)	(0.000)
extent crime imposes cost on business	-0.005***	-0.011***	0.135	0.002	-0.008***	-0.012***	-0.023***
	(0.001)	(0.001)	(0.091)	(0.002)	(0.002)	(0.001)	(0.001)
Start-up procedures to register a business	-0.005***	-0.001	-0.021*	-0.001***	-0.001**	0.001**	0.001***
	(0.000)	(0.000)	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit to private sector (% of GDP)	-0.000***	0.000***	-0.003	0.000**	0.000**	0.000***	0.002***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	4.061***	2.261***	2.511***	2.411***	2.489***	2.481***	1.259***
	(0.082)	(0.133)	(0.240)	(0.099)	(0.060)	(0.061)	(0.067)
Observations	22273	22273	22273	22273	22273	22273	22273
R-squared (within)	0.614	0.586	0.477	0.583	0.592	0.595	0.391
Adj R^2 (overall)	0.613	0.585	0.48	0.582	0.592	0.594	0.391
RMSE	0.052	0.054	0.157	0.054	0.054	0.054	0.066
F-stat	1681.583***	1537.287***	185.188***	1223.816***	1592.51***	1594.674***	894.45***
Log-likelihood	34062.796	33282.083	9588.811	33202.013	33458.241	33524.346	28995.056
Underidentification (Anderson canon. corr. LM):	2110.198***	988.784***	1681.58***	1193.474***	560.164***	668.467***	4674.724***
Weak identification test (Cragg-Donald Wald F):	2328.745***	1033.743***	11632.58***	1259.857***	574.074***	688.5***	5911.98***
Sargan (overidentification test of all instruments)	2947.8***	4422.2***	2830.12***	2498.2***	2125.4***	2225.9***	313.2***

Note: Estimations are performed with robust instrumental variable approach (ivreg2) where the predicted probability of institutions, times to prepare and pay taxes and inward foreign direct investment serve as instrument. Standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1.

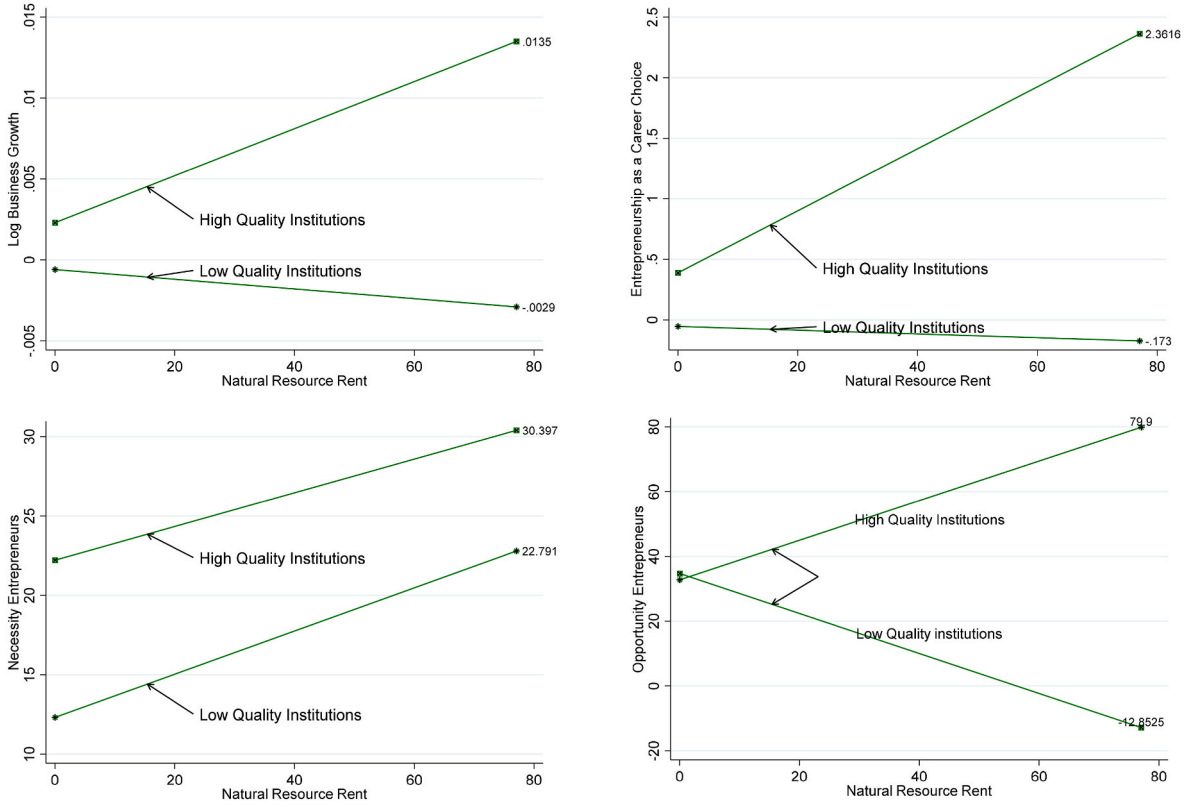

Fig. 2. Predictive margins: SSA countries.

development and business growth. In SSA countries where institutions are particularly poor, any improvement adds significant return and security for start-ups and substantially increases start-up density, including its growth and quality, as demonstrated in our study. Table 4 (spec. 1–6) demonstrates that all institutional improvements will positively moderate the relationship between natural resource rent and entrepreneurship. While all six world bank government indicators are highly correlated, the coefficient size slightly differs as different institutional improvements may affect the quality and rate of entrepreneurship differently (Audretsch and Belitski, 2021) (see Fig. 1).

Furthermore, in Fig. 2, we present the predictive margins showing the interactive role of institutions and natural resource rent on the growth and quality of business formation, entrepreneurship as a career choice, necessity and opportunity entrepreneurs. We create a composite variable to estimate the predictive margins by summing up all the institution variables. The predictive margins show how high and low institutions moderate the link between natural resource rents and the dependent variables. The graphs show that better institutions are conducive to the growth of business formation, including the choice of individuals picking up entrepreneurship as a career. While SSA countries may require strengthening all aspects of institutions for entrepreneurship and business to thrive, many countries in the region are beginning to see the need to enhance the institutional capacity for growth in business formation.

5.2. Robustness tests and endogeneity issues

We perform several robustness checks to ascertain the stability of our results, especially the moderating effect of institutional quality (see Table 5). We consider that potential endogeneity concern looms in our study since the effect of entrepreneurship and institutions can occur both ways, including the channel of resource rents. As a result, we perform the first set of robustness checks using the instrumental variable approach (Table 5). For our instruments, we follow recommendations from previous studies by using the predicted probability from the estimated equation of institutional quality while controlling for all covariates in our primary estimations (Windmeijer and Santos Silva, 1997; Wooldridge et al., 2016; Berrill et al., 2020). In addition, we employ structural instruments that include the *residual* of the estimated institution equation, *time to prepare* and *pay taxes* (in hours) and *inward foreign direct investment*. However, in Model 7, we aggregate our institutional variable as a composite indicator to predict the link between natural resource rents and business formation using the same set of instruments. The first-stage regression is reported in Table A3. Our results are largely identical to the estimation in Table 4.

In the second set of robustness, we use *entrepreneurship as a career choice* as a dependent variable (Table A1), and we find our results to converge with the baseline estimation. In fact, we find the synergistic effect to be larger, indicating that the quality of institutions is fundamental to entrepreneurship activities. Furthermore, our results are stable, indicating that through their activities, the quality of institutions can limit the effect of resource rent on business formation. We also observe that autocorrelation varies across countries, producing data panels with different first-order autocorrelation (Cheng and Nault, 2007). As a result, each panel's variance is likely to be heteroscedastic (Cheng and Nault, 2007; Mavroudi et al., 2022). To manage this, we use the Feasible Generalised Least Squares (FGLS) approach to estimate cross-sectional time series (see Table A2). We also find our results, by and large, to be significantly stable across all specifications, which are in line with our main findings. Above and beyond the impact of our control variables, we find our second hypothesis to hold. As supplementary materials, we estimate the moderating effect of institutional quality on

the link between resource rent, necessity and opportunity entrepreneurs. The results diverge from the primary estimations, especially the unconditional effects. However, the unconditional effect of natural resource rent is consistently positive and significant across all specifications for both forms of entrepreneurs. With the conditional effects, the moderating role is more pronounced in necessity than opportunity entrepreneurs (see supplementary file for details).

6. Discussion

We argue that institutional quality can help mitigate the negative effect of natural resource rent on entrepreneurship and reduce the amount of potential rent-seeking by entrepreneurs, increasing the quality of entrepreneurship in the long run. Thus, societal sustainability through entrepreneurial activities can be advanced where the quality of institutions interacts effectively with the tendency to rent-seek.

We use two constructions to determine the effect of resource rents on entrepreneurship. First is the growth and quality of new business formation (log difference) that may reflect a significant improvement. The second is entrepreneurship as a career choice. The latter construct indicates the quality and intensity of new business formation. Our argument rests on the fact that an entrepreneurship venture is an individualistic tendency that relies on extracting value from resources within the environment. In extracting this value, different entrepreneurs indulge in productive and unproductive activities that positively and otherwise impact businesses. According to studies on resource rents, entrepreneurs become agents of illicit ventures by leveraging the abundance of resource rents in a host country.

While interesting scholarly studies have argued that rent-seeking impacts the quality of business formation and cluster, our study extends this argument by emphasising how institutional quality can mitigate the effect of rent-seeking on business formation and growth. Employing a more heterogeneous dataset, we compare SSA countries that are predominantly with vast deposits of natural resources with other developing countries endowed with natural resources. Our results suggest that rent-seeking is highly pervasive in SSA countries. Also, while this confirms the results of other scholars, we find further that excessive rent-seeking behaviour can be mitigated when a government is effective; has improved regulatory quality, is politically stable; the presence of the rule of law, and an accountable government that listens to the voices of its citizens. Thus, institutions are essential for regional development (Hodgson, 2006; Rodríguez-Pose, 2013; Iddawela *et al.*, 2021). Therefore, the fundamentals of regional development include the robustness of institutions in supporting the growth of business formation.

As a result, natural resource rent can significantly impact business formation in sub-Saharan Africa. Firstly, natural resources can provide a strong incentive for business formation in this region, as they can often access raw materials at lower costs and potentially capture higher profits. In addition, natural resource rents can also provide the capital and resources needed to start and develop businesses, allowing them to expand and create new jobs. Furthermore, natural resource rents can spur infrastructure development, creating a more favourable investment climate for businesses. Finally, natural resource rent can encourage foreign direct investment, further accelerating business formation.

However, natural resource rents can majorly affect business formation in sub-Saharan Africa depending on the quality of the institutions in place. Poorly functioning institutions can lead to resource rent being siphoned off by a small minority of elites, leaving the general population with little resources to invest or use as capital for business formation. Furthermore, weak institutions leave businesses vulnerable to corruption and other rent-seeking behaviour, reducing the incentive to start a business. On the other hand, well-functioning institutions can help ensure resource rent is more evenly distributed, providing businesses with more access to capital. Quality institutions can also help to reduce corruption, providing a more predictable environment for businesses to operate and function. In addition, well-functioning institutions can help to create an environment that encourages competition and innovation, which can foster business formation. Overall, the quality of institutions in sub-Saharan Africa significantly affects the relationship between natural resource rent and business formation. This is because quality institutions are essential for creating an environment where business formation is encouraged and resource rent can be used to its fullest potential.

Consequently, when natural resources are abundant, they can provide a source of capital to finance businesses and create jobs, leading to greater economic development. However, if natural resource rents are not distributed effectively, it can lead to a "resource curse" where the money is concentrated in the hands of a few, leading to corruption and a lack of investment in other sectors of the economy. Weak institutions can exacerbate the negative effects of natural resource rents on business formation in sub-Saharan Africa. When institutions are weak, it can lead to a lack of trust in the government and its ability to regulate natural resource exploitation. As a result, weak institutions can lead to a situation where resource rents are not used for the benefit of the people but for the benefit of a corrupt few. Furthermore, weak institutions can lead to a lack of enforcement of property rights, making it difficult for businesses to obtain the resources they need to grow and develop.

Our study contributes to the extant literature by explicitly modelling and estimating the complex interrelationship between natural resource rent and entrepreneurship. Furthermore, the moderating role of institutions in this relationship may have direct policy implications. For instance, assuming a negative relationship between natural resource rent and entrepreneurial activity, a positive moderation effect would imply that, in countries with high-quality institutions, the impact of natural resource rent on entrepreneurial activity is reinforced and leveraged. Conversely, this also means that stimulating natural resource rent in countries with high-quality institutions would, at the same time, reduce entrepreneurship activity.

6.1. Policy implications

The discussions and subsequent conclusions reached in this study enable us to highlight the role of the institutional environment in the relationship between natural resource ret and entrepreneurship activity. For instance, if properly designed, formal institutions can become a springboard that incentivises entrepreneurs to engage in productive activities. On the other hand, if formal institutions are poorly designed, including when regulating agencies responsible for ensuring their effective implementation do not consider the gap between formal and informal rules, this can result in unintended consequences. These include avenues for entrepreneurs to engage in activities that allow them to dodge the formal legal framework and follow informal norms that conflict with formal procedures. Also, entrepreneurs may engage in unproductive (e.g., opportunistic entrepreneurs) or even socially disparaging activities (Baumol, 1993; Audretsch et al., 2021). In the end, establishing an effective economic policy should be a priority to ensure that entrepreneurs in resource-rich countries have the necessary means to contribute to economic development. While entrepreneurship is never short in supply, the overarching outcome stipulated in this study is that policies must be effective to constantly make unproductive activities more complex and costlier to engage in than productive ones. We observe in this study that an increase in natural resource rent reduces entrepreneurship activity; however, it may also reduce entrepreneurship

out of a need and promote high-quality and productive entrepreneurship. This can be reflected in policy, in particular, redirecting resources to leverage the effect of necessity entrepreneurship and looking into ways to facilitate productive entrepreneurship (Baumol, 1993; Sobel, 2008)

Furthermore, economic development policy would need to be directed towards promoting various entrepreneurial activities that rely on natural resource rent to a different extent. Nonetheless, implementing robust policies is not easy as there are always barriers when initiating good policy reform. In case no incentives are offered to entrepreneurs – those will continue stepping up as necessity entrepreneurs and will do rent-seeking and opportunism, increasing corruption and inefficiency.

Before embarking on institutional reforms that curb rent-seeking activities, policymakers must establish a reliable baseline or "take-off point" by considering formal and informal institutions within which entrepreneurs function. A thorough appraisal and a proper application of institutional reform's take-off process must consider the main economic actors. This is key since institutional reforms must be designed to fit conditions peculiar to a given country. On the other hand, it is essential to note that general techniques for institutional reform may not apply to local situations, and so may not "stick". Thus, an ill-adapted institutional reform can further promote rent-seeking activities. Besides, without a good baseline, there is no way to measure success or failure accurately, let alone identify challenges associated with strengthening institutions—as policymakers may not be fully aware of the problems entrepreneurs face. Hence, having a comprehensive understanding of the various bottlenecks entrepreneurs encounter in their operations is essential as this defines a starting point.

Furthermore, putting the required conditions under institutional transformation and capacity building is essential. A key reason for establishing a robust institutional capacity is to create policy ownership; in that way, institutional reforms that consider government effectiveness are seen and deemed authentic and driven towards specific desired goals that may benefit resource-rich countries. However, adopting policies acknowledged by outsiders is usually challenging to accomplish. The challenge is identifying change agents amongst entrepreneurs and policymakers who can further push for institutional reform. In addition, policymakers must ensure that the necessary institutional reforms are effectively implemented. Identifying informal institutions that support the needed institutional reforms in resource-rich countries can also help achieve policy objectives due to the accepted norms and values used to coordinate activities in resource-rich countries. For example, drawing a road map that considers the major institutional stakeholder is essential.

6.2. Managerial implications

To a large extent, entrepreneurship is considerably affected when institutions' quality is poor or in shortfall. Our study reinforces the view that poor institutions certainly have a negative effect on entrepreneurial activity. Managerial implications must be highlighted in that if managers and individual entrepreneurs engage in entrepreneurial activities and wish to develop productive-oriented entrepreneurship activity, they must negotiate with the government a mechanism under which natural resource rent is shared between economic agents and society. This will ensure that entrepreneurs are not crowded out; if they are, then mechanisms exist to redistribute natural resource rent to support incentives for entrepreneurs. There are also differences in policies in the short and long term, as both entrepreneurs and the government must adhere to the rules of the game. If observed that natural resource rent does not directly or indirectly benefit them, entrepreneurs will have low tax morale and issues with compliance with the law (Mickiewicz et al., 2019). This draws a significant grey economy sector, resulting in less tax income and corruption. Managers must ensure their entrepreneurial activities are conducted within the framework of procedures by complying with all the regulatory agencies and other institutional agents.

6.3. Limitations and future research

Entrepreneurship has been shown as an essential and dynamic structure that propels the economic growth of several economies, including SSA (Fritsch and Mueller, 2007; Audretsch and Belitski, 2017; Chambers & Munemo, 2019; Munemo, 2021). While rent-seeking may impede the quality and quantity of business formation, multinational resource-rich enterprises (MNREs) can exploit this to impede start-up entry. Hence, nurturing entrepreneurial environments is a policy approach to boost a nation's economy by fostering entrepreneurial practices and behaviours that promote small businesses' formation and growth. One important aspect that this study highlights to be crucial for developing and emerging new businesses is the quality of institutions. However, legal and regulatory frameworks act as rules of the game and can induce or hinder productive entrepreneurs. Future research could shed light on understanding the full impact of how institutions shape the utilisation of natural resource rents to impact the quality of business formation, potentially overcoming the limitations of our study. The first limitation is linked to the measurement of business density as the quality of business formation. Such quality may differ across countries, which might also be shaped by institutions that are also diverged. While institutional quality in the countries studied may not converge, an outright generalisation might not be feasible. Data availability for extended periods could also be fundamental for analysing advanced and emerging institutions. Last, quantitative analyses are a robust approach to examining complex situations, as with resources and institutions. However, triangulations through quantitative and qualitative approaches can offer more significant insights on some bearings that our study prompted. Nonetheless, we still believe to a considerable extent, that our analysis provides valuable insight for policymakers and institution enthusiasts as to the need to strengthen the different aspects of institutions for quality and gains. Lastly, our study raises a provocative question of how entrepreneurial quality should be considered, especially in regions where resource rents have hindered entrepreneurship's emergence, persistence, and quality.

Declaration of competing interest

No conflict of interest.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.resourpol.2023.103592.

Appendix B

Table A1
Relationships between resource rents, institutions, and entrepreneurship as a career choice

DV: Entrepreneurship as a Career Choice							
VARIABLES	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)
Total natural resources rents (% of GDP)	-4.056***	0.879***	0.820***	0.303***	0.497***	1.139***	-9.606***
	(0.084)	(0.043)	(0.047)	(0.046)	(0.041)	(0.046)	(0.159)
Resource rents squared	0.027***	-0.010***	-0.013***	0.012***	-0.005***	-0.031***	-0.032***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
control of corruption	-1.283***	-0.804***	-0.795***	-0.440***	-0.540***	-0.968***	-2.991***
	(0.030)	(0.033)	(0.034)	(0.034)	(0.031)	(0.033)	(0.052)
Government Effectiveness	18.779***	3.033***	9.286***	14.836***	10.878***	6.737***	42.280***
	(0.725)	(0.803)	(0.807)	(0.784)	(0.737)	(0.774)	(1.355)
Political Stability	10.880***	13.586***	13.543***	10.913***	1.419***	16.097***	17.843***
	(0.279)	(0.318)	(0.341)	(0.315)	(0.392)	(0.328)	(0.424)
Regulatory Quality	22.076***	26.926***	21.652***	22.376***	17.418***	29.337***	41.528***
	(0.572)	(0.628)	(0.895)	(0.627)	(0.627)	(0.626)	(1.179)
Rule of law	14.358***	7.104***	6.415***	-1.738**	17.895***	4.124***	19.540***
	(0.723)	(0.788)	(0.790)	(0.781)	(0.781)	(0.798)	(1.233)
Voices and Accountability	-28.256***	-22.120***	-21.457***	-25.168***	-23.227***	-19.581***	-27.182***
	(0.370)	(0.393)	(0.398)	(0.393)	(0.374)	(0.616)	(0.590)
Resource rent*control of corruption	0.106***						0.261***
	(0.002)						(0.004)
Resource rent*government effectiveness		0.561***					-2.406***
		(0.035)					(0.088)
Resource rent*regulatory quality			0.405***				-1.079***
			(0.036)				(0.071)
Resource rent*rule of law				1.147***			-0.636***
				(0.031)			(0.097)
Resource rent*political stability					0.703***		0.224***
					(0.014)		(0.021)
Resource rent*voice & accountability						-0.241***	-0.990***
						(0.046)	(0.049)
Employment in services (% of total employment)	0.099***	-0.103***	-0.095***	-0.236***	0.645***	0.017	1.327***
	(0.018)	(0.021)	(0.021)	(0.020)	(0.023)	(0.021)	(0.030)
Employment in industry (% of total employment)	1.540***	1.469***	1.467***	2.206***	-0.545***	0.974***	-2.040***
	(0.063)	(0.072)	(0.076)	(0.073)	(0.072)	(0.072)	(0.099)
Population (logged)	-229.858***	-152.106***	-152.943***	-195.567***	-159.622***	-141.402***	-261.784***
	(3.714)	(3.861)	(3.930)	(3.996)	(3.648)	(3.856)	(3.797)
GDP (logged)	-4.251***	-4.381***	-5.027***	-3.141***	-5.185***	-5.927***	-10.057***
	(0.495)	(0.542)	(0.545)	(0.531)	(0.516)	(0.597)	(0.500)
Trade (% of GDP)	0.189***	0.160***	0.154***	0.188***	0.156***	0.141***	0.136***
	(0.005)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)
Property rights (logged)	-19.743***	-2.965***	-2.331***	-11.223***	-9.400***	1.954***	-17.208***
	(0.542)	(0.547)	(0.570)	(0.583)	(0.510)	(0.540)	(0.511)
Agriculture, value added (% of GDP)	0.271***	0.298***	0.280***	0.325***	0.432***	0.290***	0.296***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.013)
Government spending	-0.380***	-0.464***	-0.457***	-0.433***	-0.452***	-0.493***	-0.438***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)	(0.007)
Tertiary education enrollment, gross %	4.252***	3.861***	3.835***	3.898***	4.304***	4.131***	6.239***
	(0.042)	(0.046)	(0.047)	(0.045)	(0.044)	(0.060)	(0.056)
extent crime imposes cost on business	10.269***	6.523***	6.487***	7.235***	6.951***	6.105***	13.008***
	(0.212)	(0.225)	(0.227)	(0.220)	(0.212)	(0.224)	(0.202)
Start-up procedures to register a business (number)	0.450***	1.643***	1.641***	1.030***	1.085***	1.872***	0.262***
	(0.052)	(0.055)	(0.058)	(0.056)	(0.052)	(0.053)	(0.058)
Domestic credit to private sector (% of GDP)	-0.589***	-0.415***	-0.416***	-0.491***	-0.370***	-0.393***	-0.641***
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.010)
Constant	1,031.448***	637.988***	641.770***	829.213***	684.878***	587.501***	1,227.352***
	(15.162)	(15.300)	(15.711)	(16.044)	(14.410)	(15.142)	(15.839)
F-stat	2474.379***	1892.834***	1875.683***	2035.104***	2204.44***	1863.079***	2906.716***
F test that all u_i = 0	2365.08***	2242.88***	2420.36***	2221.25***	2265.69***	2414.79***	3294.11***
Observations	22273	22273	22273	22273	22273	22273	22273
Hausman Test chi^2 (24)	5419.643	30363.40	2539.789	7227.091	5860.317	5855.017	51074.31
P-value (Hausman test)	0.0000	0.0033	0.0043	0.0000	0.0000	0.0013	0.0000
R-squared (within)	0.7	0.641	0.639	0.658	0.675	0.638	0.773
Adj R^2 (overall)	0.7	0.641	0.639	0.657	0.675	0.637	0.772
RMSE	9.063	9.916	9.945	9.685	9.43	9.966	7.894
sigma_u	17.614	13.36	13.199	15.983	14.518	12.903	19.727
sigma_e	9.063	9.916	9.945	9.685	9.43	9.966	7.894
rho	0.791	0.645	0.638	0.731	0.703	0.626	0.862
Log-likelihood	-80684.511	-82686.989	-82751.877	-82162.824	-81569.484	-82799.802	-77605.925
Number of Years (with gaps)	7	7	7	7	7	7	7

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.

Table A2
Relationship between resource rents, institutions and business formation (FGLS estimation)

VARIABLES	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)
	Q of Biz	Q of Biz	Q of Biz	Q of Biz	Q of Biz	Q of Biz	Q of Biz
Total natural resources rents (% of GDP)	-0.006***	-0.001	0.001***	-0.001***	0.001***	-0.002***	0.014***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Resource rent squared	-0.015***	0.009***	-0.007***	-0.013***	-0.014***	-0.053***	-0.032***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
control of corruption	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Government Effectiveness	0.001***	0.005***	0.003***	0.003***	0.002***	0.003***	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Regulatory quality	0.108***	0.123***	0.108***	0.113***	0.100***	0.100***	0.085***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)
rule of law	0.033***	0.045***	0.032***	0.024***	0.010***	0.015***	0.017***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
political stability	0.154***	0.137***	0.128***	0.131***	0.150***	0.132***	0.251***
	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.006)
voice & accountability	-0.181***	-0.277***	-0.193***	-0.248***	-0.173***	-0.163***	-0.364***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Resource rent*control of corruption	0.001***						0.001***
	(0.000)						(0.000)
Resource rent*government effectiveness		0.006***					0.001**
		(0.000)					(0.000)
Resource rent*regulatory quality			0.002***				-0.012***
			(0.000)				(0.000)
Resource rent*rule of law				0.008***			0.022***
				(0.000)			(0.000)
Resource rent*political stability					0.002***		0.001***
					(0.000)		(0.000)
Resource rent*voice & accountability						0.004***	0.001***
						(0.000)	(0.000)
Employment in services (% of total employment)	0.005***	0.004***	0.004***	0.004***	0.006***	0.002***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment in industry (% of total employment)	-0.012***	-0.011***	-0.010***	-0.010***	-0.018***	-0.005***	-0.013***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Population (logged)	-0.605***	-0.853***	-0.529***	-0.637***	-0.480***	-0.569***	-0.638***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)	(0.018)
GDP (logged)	-0.052***	-0.073***	-0.064***	-0.055***	-0.064***	-0.049***	-0.068***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Trade (% of GDP)	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property rights (logged)	-0.042***	-0.054***	-0.044***	-0.069***	-0.044***	-0.046***	-0.067***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Agriculture, value added (% of GDP)	0.001***	0.001***	0.001***	0.001***	0.002***	0.002***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Government spending	-0.001***	-0.001***	-0.001***	-0.000***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary education enrollment, gross %	0.005***	0.010***	0.004***	0.005***	0.005***	0.002***	0.010***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
extent crime imposes cost on business	-0.026***	-0.011***	-0.027***	-0.024***	-0.029***	-0.026***	-0.026***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Start-up procedures to register a business	-0.003***	-0.005***	-0.003***	-0.005***	-0.003***	-0.003***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit to private sector (% of GDP)	0.001***	-0.000***	0.000***	0.000***	0.001***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	2.758***	3.700***	2.439***	2.891***	2.224***	2.551***	2.749***
	(0.060)	(0.063)	(0.060)	(0.057)	(0.058)	(0.059)	(0.067)
Observations	22,273	22,273	22,273	22,273	22,273	22,273	22,273
Chi^2	81462.601***	81462.61***	81462.61***	35826.05***	83876.12***	107388.91***	91249.4***
ll	34123.633	340234.64	34154.26	34144.66	34156.62	34166.56	35144.77
Number of Years (with gaps)	7	7	7	7	7	7	7

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.

Table A3
First-stage regression: Institution variables as dependent variables

First stage	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)
VARIABLES	Corruption_free	GE	PS	RQ	RoL	VA	quality_insti
Residuals	0.957***	0.005***	0.039***	0.007***	0.025***	0.024***	0.957***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Time to prepare and pay taxes (hours)	-0.000***	-0.001***	-0.001***	-0.001***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Foreign direct investment, net inflows (% of GDP)	0.109***	0.006***	0.028***	0.008***	0.013***	0.011***	0.109***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Total natural resources rents (% of GDP)	-0.020***	-0.006***	0.004***	-0.005***	-0.008***	-0.013***	-0.020***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment in services (% of total employment)	-0.027***	0.020***	0.011***	0.013***	0.011***	0.010***	-0.027***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Employment in industry (% of total employment)	0.146***	-0.062***	-0.065***	-0.052***	-0.034***	-0.051***	0.146***
	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.003)
Population (logged)	-3.500***	2.004***	-1.407***	0.343***	-1.951***	-2.455***	-3.500***
	(0.114)	(0.036)	(0.069)	(0.047)	(0.044)	(0.073)	(0.114)
GDP (logged)	1.008***	0.115***	0.334***	0.379***	0.296***	0.516***	1.008***
	(0.022)	(0.007)	(0.014)	(0.009)	(0.009)	(0.014)	(0.022)
Trade (% of GDP)	-0.011***	-0.002***	0.004***	-0.001***	-0.001***	-0.001***	-0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property rights (logged)	12.895***	0.465***	0.494***	0.607***	0.817***	0.824***	12.895***
	(0.012)	(0.004)	(0.007)	(0.005)	(0.005)	(0.008)	(0.012)
Agriculture, value added (% of GDP)	-0.181***	0.002***	-0.011***	0.007***	0.004***	0.011***	-0.181***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Government spending	-0.110***	-0.003***	-0.001***	0.001***	-0.005***	-0.012***	-0.110***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary education enrollment, gross %	0.077***	0.011***	-0.020***	0.019***	0.030***	0.027***	0.077***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
extent crime imposes cost on business	-3.247***	-0.234***	-0.524***	-0.172***	-0.321***	-0.193***	-3.247***
	(0.005)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.005)
Start-up procedures to register a business	-0.141***	0.038***	-0.041***	0.023***	0.000	-0.005***	-0.141***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Domestic credit to private sector (% of GDP)	0.110***	0.011***	0.020***	0.010***	0.010***	0.014***	0.110***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	14.960***	-9.880***	4.419***	-5.016***	4.533***	6.077***	14.960***
	(0.418)	(0.131)	(0.255)	(0.171)	(0.163)	(0.267)	(0.418)
Observations	22123	22123	22123	22123	22123	22123	22123
R-squared	0.998	0.924	0.907	0.86	0.892	0.751	0.998
Adj R^2	0.998	0.924	0.907	0.86	0.892	0.751	0.998
RMSE	0.461	0.144	0.281	0.189	0.18	0.294	0.461
F-stat	555414.63***	16870.228***	13482.412***	8509.35***	11388.23***	4163.36***	555414.63***
Log-likelihood	-14261.193	11477.467	-3297.553	5497.243	6562.346	-4332.209	-14261.193

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.

Table A4
Pairwise correlations of instruments and instrumented variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
control of corruption	1.000									
Government Effectiveness	0.827***	1.000								
Political Stability	0.594***	0.586***	1.000							
Regulatory Quality	0.798***	0.885***	0.555***	1.000						
Rule of Law	0.889***	0.889***	0.646***	0.834***	1.000					
Voice & Accountability	0.652***	0.718***	0.510***	0.707***	0.726***	1.000				
Aggregated Institutions	1.000***	0.722***	0.507***	0.701***	0.769***	0.571***	1.000			
Predicted Probability of institutions	0.557***	0.280***	0.179***	0.241***	0.342***	0.137***	0.518***	1.000		
Tax payment time	-0.151***	-0.168***	-0.051***	-0.124***	-0.192***	−0.022***	−0.142***	−0.257***	1.000	
Inward FDI	0.072***	0.031***	0.299***	0.115***	0.065***	0.069***	0.041***	0.000	0.028***	1.000

***p < 0.01, **p < 0.05, *p < 0.1.

Table A5
List of countries in sample

Angola	Madagascar
Benin	Malawi
Botswana	Mali
Burkina Faso	Mauritania
Burundi	Mauritius
Cameroon	Mozambique
Central African Republic	Namibia
Chad	Niger
Congo, Dem. Rep.	Nigeria
Congo, Rep.	
Cote d'Ivoire	
Ethiopia	Somalia
Gabon	Sudan
Ghana	Tanzania
Kenya	Togo
Lesotho	Uganda
Liberia	Zambia

References

Acemoglu, D., 1995. Reward structures and the allocation of talent. Eur. Econ. Rev. 39 (1), 17–33.
Acs, Z.J., Desai, S., Hessels, J., 2008. Entrepreneurship, economic development and institutions. Small Bus. Econ. 31 (3), 219–234.
Ahali, A., Ackah, I., 2015. Are they Predisposed to the resource curse? Oil in Somalia. Int. J. Energy Econ. Pol. 5, 231–245.
Alesina, A., Perotti, R., Tavares, J., Obstfeld, M., Eichengreen, B., 1998. The political economy of fiscal adjustments. Brookings Pap. Econ. Activ. 1998 (1), 197–266.
Asongu, S.A., Nwachukwu, J.C., Orim, S.M.I., 2018. Mobile phones, institutional quality and entrepreneurship in Sub-Saharan Africa. Technol. Forecast. Soc. Change 131, 183–203.
Audretsch, D.B., Belitski, M., 2021. Frank Knight, uncertainty and knowledge spillover entrepreneurship. J. Inst. Econ. 17 (6), 1005–1031.
Audretsch, D.B., Belitski, M., Cherkas, N., 2021. Entrepreneurial ecosystems in cities: the role of institutions. PLoS One 16 (3), e0247609.
Audretsch, D.B., Belitski, M., Desai, S., 2019. National business regulations and city entrepreneurship in Europe: a multilevel nested analysis. Entrep. Theory Pract. 43 (6), 1148–1165.
Awoa, P.A., Ondoa, H.A., Tabi, H.N., 2022b. Women's political empowerment and natural resource curse in developing countries. Resour. Pol. 75, 102442.
Ayyagari, M., Kosová, R., 2010. Does FDI facilitate domestic entry? Evidence from the Czech Republic. Rev. Int. Econ. 18 (1), 14–29.
Baland, J.M., Francois, P., 2000. Rent-seeking and resource booms. J. Dev. Econ. 61 (2), 527–542.
Baumol, W.J., 1968. Entrepreneurship in economic theory. Am. Econ. Rev. 58, 64–71.
Baumol, W.J., 1993. Formal entrepreneurship theory in economics: existence and bounds. J. Bus. Ventur. 8 (3), 197–210.
Baumol, W.J., 1990. Entrepreneurship: productive, unproductive, and destructive. J. Polit. Econ. 98 (5), 893–921.
Belitski, M., Chowdhury, F., Desai, S., 2016. Taxes, corruption, and entry. Small Bus. Econ. 47 (1), 201–216.
Belitski, M., Desai, S., Godley, A., 2021. Small business and poverty: evidence from post-Soviet cities. Reg. Stud. 55 (5), 921–935.
Berrill, J., O'Hagan-Luff, M., Van Stel, A., 2020. The moderating role of education in the relationship between FDI and entrepreneurial activity. Small Bus. Econ. 54 (4), 1041–1059.
Bjorvatn, K., Farzanegan, M.R., 2013. Demographic transition in resource-rich countries: a blessing or a curse? World Dev. 45, 337–351.
Brahnbhatt, M., Canuto, O., Vostroknutova, E., 2010. Dealing with Dutch disease. In: Economic Premise, vol. 16. World Bank, Washington, DC.
Brunnschweiler, C.N., Bulte, E.H., 2008. The resource curse revisited and revised: a tale of paradoxes and red herrings. J. Environ. Econ. Manag. 55 (3), 248–264.
Canh, et al., 2021. Entrepreneurship. Entrepreneurship and natural resource rents: evidence from excessive entrepreneurial activity. Sustain. Prod. Consum. 25, 15–26.
Chambers, D., Munemo, J., 2019a. Regulations, institutional quality and entrepreneurship. J. Regul. Econ. 55 (1), 46–66.
Chambers, D., Munemo, J., 2019b. Natural resource dependency and entrepreneurship: are nations with high resource rents cursed? J. Int. Dev. 31 (2), 137–164.
Cheng, Z., Nault, B.R., 2007. Industry-level supplier-driven IT spillovers. Manag. Sci. 53 (8), 1199–1216.
Chowdhury, F., Audretsch, D.B., Belitski, M., 2019. Institutions and entrepreneurship quality. Entrep. Theory Pract. 43 (1), 51–81.
Collier, P., 2017. The institutional and psychological foundations of natural resource policies. J. Dev. Stud. 53 (2), 217–228.
Corden, W., 1984. Booming sector and Dutch disease economics: Survey and consolidation. Oxf. Econ. Pap. 36, 359–380.
De Backer, K., Sleuwaegen, L., 2003. Does foreign direct investment crowd out domestic entrepreneurship? Rev. Ind. Organ. 22 (1), 67–84.
Djimeu, E.W., Omgba, L.D., 2019. Oil windfalls and export diversification in oil-producing countries: evidence from oil booms. Energy Econ. 78, 494–507.
Doytch, N., Epperson, N., 2012. FDI and entrepreneurship in developing countries. GSTF Business Review (GBR) 1 (3), 120–126.
Ebeke, C., Omgba, L.D., Laajaj, R., 2015. Oil, governance and the (mis) allocation of talent in developing countries. J. Dev. Econ. 114, 126–141.
Estrin, S., Korosteleva, J., Mickiewicz, T., 2013. Which institutions encourage entrepreneurial growth aspirations? J. Bus. Ventur. 28 (4), 564–580.
Farhadi, M., Islam, M.R., Moslehi, S., 2015. Economic freedom and productivity growth in resource-rich economies. World Development 72, 109–126.
Farzanegan, M.R., 2014. Can oil-rich countries encourage entrepreneurship? Enterpren. Reg. Dev. 26 (9–10), 706–725.
Freytag, A., Langlotz, S., 2014. The resource-conflict nexus: an African perspective. Societies in transition. Sub-Saharan Africa between Conflict and Reconciliation 2, 155–176.
Friedman, B.A., 2011. The relationship between governance effectiveness and entrepreneurship. Int. J. Humanit. Soc. Sci. 1 (17), 221–225.
Fritsch, M., Mueller, P., 2007. The persistence of regional new business formation-activity over time–assessing the potential of policy promotion programs. J. Evol. Econ. 17 (3), 299–315.
Galindo-Martín, M.Á., Castaño-Martínez, M.S., Méndez-Picazo, M.T., 2021. The role of entrepreneurship in different economic phases. J. Bus. Res. 122, 171–179.
Grande, J., Madsen, E.L., Borch, O.J., 2011. The relationship between resources, entrepreneurial orientation and performance in farm-based ventures. Enterpren. Reg. Dev. 23 (3–4), 89–111.
Groşanu, A., Boţa-Avram, C., Răchişan, P.R., Vesselinov, R., Tiron-Tudor, A., 2015. The influence of country-level governance on business environment and entrepreneurship: a global perspective. Amfiteatru Economic Journal 17 (38), 60–75.
Gu, W., Zheng, X., 2021. An empirical study on the impact of sustainable entrepreneurship: based on the environmental Kuznets model. J. Bus. Res. 123, 613–624.
Gylfason, T., 2001. Natural resources, education, education, and economic development. Eur. Econ. Rev. 45, 847–859.
Gylfason, T., Zoega, G., 2006. Natural resources and economic growth: the role of investment. World Econ. 29, 1091–1115.
Harding, T., Venables, A., 2010. Exports, Imports and Foreign Exchange Windfalls. Oxford: University of Oxford, Unpublished Manuscript.
Ismail, K., 2010. The structural manifestation of the 'Dutch disease:' the case of oil-exporting countries. IMF Working Paper 10/103.
Kalyuzhnova, Y., Belitski, M., 2019. The impact of corruption and local content policy on firm performance: evidence from Kazakhstan. Resour. Pol. 61, 67–76.
Kamguia, B., Keneck-Massil, J., Nvuh-Njoya, Y., Tadadjeu, S., 2022. Natural resources and innovation: is the R&D sector cursed too? Resour. Pol. 77, 102725.
Kaufmann, D., Kraay, A., Mastruzzi, M., 2010. The Worldwide Governance Indicators: Methodology and Analytical Issues (World Bank Policy Research Working. Paper No. 5430). Retrieved from. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1682130.
Kher, R., Streeter, D.H., Just, D.R., 2012. The good job trap: opportunity cost as a deterrent to immediate venture creation. Int. Rev. Entrepreneur. 10 (4), 127–152.
Kim, P.H., Li, M., 2014. Injecting demand through spillovers: foreign direct investment, domestic socio-political conditions, and host-country entrepreneurial activity. J. Bus. Ventur. 29 (2), 210–231.
Klapper, L., Laeven, L., Rajan, R., 2006. Entry regulation as a barrier to entrepreneurship. J. Financ. Econ. 82 (3), 591–629.
Kolstad, I., Wiig, A., 2009. Is transparency the key to reducing corruption in resource-rich countries? World Dev. 37 (3), 521–532.

Krueger, A., 1974. The political economy of the rent-seeking society. Am. Econ. Rev. 64 (3), 291–303.
Lane, P.R., Tornell, A., 1996. Power, growth, and the voracity effect. J. Econ. Growth 1 (2), 213–241.
Law, S.H., Azman-Saini, W.N.W., Ibrahim, M.H., 2013. Institutional quality thresholds and the finance – growth nexus. J. Bank. Finance 37, 12.
Lv, Z., Rodríguez-García, M., Sendra-García, J., 2021. Does institutional quality affect the level of entrepreneurial success differently across the entrepreneurship distribution? Rev. Manag. Sci. 15 (4), 937–955.
Majbouri, M., 2016. Oil and entrepreneurship. Energy Pol. 94, 10–15.
Mavroudi, E., Kafouros, M., Jia, F., Hong, J., 2022. How can MNEs benefit from internationalising their R&D across countries with both weak and strong IPR protection? J. Int. Manag., 100994
Mehlum, H., Moene, K., Torvik, R., 2006b. Institutions and the resource curse. Econ. J. 116 (508), 1–20.
Mehlum, H., Moene, K., Torvik, R., 2006a. Cursed by resources or institutions? World Economy 29 (8), 1117–1131.
Menaldo, V., 2016. The Institutions Curse. Cambridge University Press, Cambridge.
Mercado, R.V., 2019. Capital flow transitions: domestic factors and episodes of gross capital inflows. Emerg. Mark. Rev. 38.
Miamo, C.W., Achuo, E.D., 2022. Can the resource curse be avoided? An empirical examination of the nexus between crude oil price and economic growth. SN Bus. Econ. 2, 5.
Mickiewicz, T., Rebmann, A., Sauka, A., 2019. To pay or not to pay? Business owners' tax morale: testing a neo-institutional framework in a transition environment. J. Bus. Ethics 157 (1), 75–93.
Munemo, J., 2012. Entrepreneurship in developing countries: is Africa different? J. Dev. Enterpren. 17 (1), 1–12.
Munemo, J., 2021. Do African resource rents promote rent-seeking at the expense of entrepreneurship? Small Bus. Econ. 58 (3), 1647–1660.
Munemo, J., 2022. Do African resource rents promote rent-seeking at the expense of entrepreneurship? Small Bus. Econ. 58 (3), 1647–1660.
Munoz, P., Newbery, R., Kimmitt, J., 2019. Poverty and the varieties of entrepreneurship in the pursuit of prosperity. J. Bus. Ventur. 35 (4), 2–18.
Murphy, M., Shleifer, A., Vishny, W., 1993. Why is rent-seeking so costly to growth? Am. Econ. Rev. 83, 409–414.
North, D., 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge.
North, D., 1993. Economic performance through time. Am. Econ. Rev. 84, 359–368.
Omgba, L.D., 2009. On the duration of political power in Africa: the role of oil rents. Comp. Polit. Stud. 42 (3), 416–436.
Prasad, S.K., 2018. Business model for transforming a coal mining asset into a rent generating resource: a study under multiple strategic frameworks. Resour. Pol. 55 (C), 163–170.
Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., Chin, N., 2005. Global entrepreneurship monitor: data collection design and implementation 1998–2003. Small Bus. Econ. 24 (3), 205–231.
Robinson, J.A., Torvik, R., Verdier, T., 2006. Political foundations of the resource curse. J. Dev. Econ. 79 (2), 447–468.
Ross, M.L., 2008. Oil, Islam, and women. Am. Polit. Sci. Rev. 102 (1), 107–123, 2008.
Sabirianova, K., Svejnar, J., Terrell, K., 2005. Distance to the efficiency frontier and foreign direct investment spillovers. J. Eur. Econ. Assoc. 3 (2), 576–586.
Sachs, J., Warner, A., 2001. The curse of natural resources. Eur. Econ. Rev. 45, 827–838.
Schumpeter, J.A., 1965. The Theory of Economic Development an Inquiry into Profit, Capital, Credit, Interest, and the Business Cycle. Oxford Univ.Press, New York.
Sini, S., Abdul-Rahim, A.S., Chin, L., Said, R., Sulaiman, C., 2022. Natural resources' impact on capital flow and conflict relationship in Africa: a novel insight from GMM and quantile regression. Resour. Pol. 78, 102791.
Sobel, R.S., 2008. Testing Baumol: institutional quality and the productivity of entrepreneurship. J. Bus. Ventur. 23 (6), 641–655.
Sophia, S., Demetrios, P., Dimitris, S., 2004. Rural entrepreneurship in Europe. A research framework and agenda. Int. J. Entrepreneurial Behav. Res. 10 (6), 404–425.
Thébaud, S., 2010. Gender and entrepreneurship as a career choice: do self-assessments of ability matter? Soc. Psychol. Q. 73 (3), 288–304.
Tomski, P., 2014. Entrepreneurship as a career choice: the empirical perspective. Polish J. Manag. Stud. 9, 244–253.
Tornell, A., Lane, P.R., 1999. The voracity effect. Am. Econ. Rev. 89 (1), 22–46.
Urbano, D., Alvarez, C., 2014. Institutional dimensions and entrepreneurial activity: an international study. Small Bus. Econ. 42, 703–716.
Urbano, D., Guerrero, M., Ferreira, J.J., Fernandes, C.I., 2019. New technology entrepreneurship initiatives: which strategic orientations and environmental conditions matter in the new socio-economic landscape? J. Technol. Tran. 44, 1577–1602.
Windmeijer, F.A., Santos Silva, J.M., 1997. Endogeneity in count data models: an application to demand for health care. J. Appl. Econom. 12 (3), 281–294.
Wooldridge, J.M., Wadud, M., Lye, J., 2016. Introductory Econometrics: Asia Pacific Edition with Online Study Tools 12 Months. Cengage AU.
Youssef, A.B., Boubaker, S., Omri, A., 2018. Entrepreneurship and sustainability: The need for innovative and institutional solutions. Technological Forecasting and Social Change 129, 232–241.
Zhou, R., Abbasi, K.R., Salem, S., Almulhim, A.I., Alvarado, R., 2022. Do natural resources, economic growth, human capital, and urbanisation affect the ecological footprint? A modified dynamic ARDL and KRLS approach. Resour. Pol. 78, 102782.

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