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CREDIT - INEQUALITY NEXUS: THE ROLE OF NATURAL RESOURCES

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ABSTRACT: This article offers a contribution to the understanding of the links between credit, inequality and natural resources, using panel data from 2002 to 2021 for 31 countries. A system-generalised method of moments was employed to determine the dynamic relationship between the variables of the study. The findings of the study suggest inequality and natural resources have a negative and significant relationship with credit. Higher inequality levels and natural resources rents are associated with a lower ratio of private credit to gross domestic product. The study offers an insight into the three pillars of sustainability, namely economic, social and environmental. It is essential for policymakers to integrate environmental factors such as natural resources in the relationships between inequality and the financial sector.

KEYWORDS: credit, inequality, natural resources, mobility, panel data

Introduction

Over the years, the global inequality gap within countries has been on the rise and policymakers and academics are searching for answers to creating economic mobility and more equal societies. In the Sustainable Development Goals (SDGs), the United Nations (2015) acknowledged the link between inequality and the financial sector. Piketty & Saez (2013) summarised that in a credit-constrained society, comparable underlying processes may strengthen the link between inequality and a lack of social mobility. Rising inequality is a concern for economic growth and social cohesion, and it has been in the spotlight for policy (Galor & Zeira, 1993; Stiglitz, 2012; Piketty & Saez, 2013; Magwedere & Marozva, 2022). Finance has been argued to be a key facilitator in shaping the economic outcomes of businesses and households (Delis et al., 2021). In other studies, it was observed that credit applicants with similarities in income and other personas experience significantly different incomes after a credit decision (Kearney & Levine, 2016; Malinen, 2016; Delis et al., 2021). That is, a credit decision (acceptance or rejection) by a financial institution affects an individual's future income and income mobility (Delis et al., 2021). The global inequality challenge has been accompanied by little to no intergenerational mobility of income.

On the other hand, the availability of natural resources and wealth can determine the development path of countries (Van der Ploeg, 2011; Dwumfour & Ntow-Gyamfi, 2018). Literature on the natural resource curse suggests that countries with natural resources wealth are also accompanied by higher inequalities and slower progress in financial and economic development (Beck, 2012; Dwumfour & Ntow-Gyamfi, 2018; Beck & Poelhekke, 2022). Pouokam (2021) argued that natural resources constitute a larger percentage of a country's wealth, and natural resource-rich countries are plagued with persistent inequality and stagnant economic growth. The study further suggested that in low and medium-income countries, natural resource rents have very little contribution to inclusive growth as they generate income inequalities (Pouokam, 2021). Natural resources rents are natural capital for a country which is capable of generating other forms of capital, such as fiscal revenue. Hence, the financial sector plays a pivotal role in intermediating domestic savings into domestic investment. Thus, it ought to serve as a central absorption tool for natural resource windfalls (Beck & Poelhekke, 2022).

There is an observation in previous literature that countries endowed with natural resources have persistent macroeconomic challenges, which include an underdeveloped financial sector and perpetual inequality, among others (van der Ploeg & Venables, 2012; Bhattacharyya & Hodler, 2014; Beck & Poelhekke, 2022). It is not clear in previous studies whether inequality can

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also shape economic outcomes of the financial sector, such as credit. This paper contributes to the debate on how inequality can affect private credit, as there appears to be a convergence of periods of high inequality and credit booms in some countries. The role of finance is influential in shaping economic opportunities of households and businesses (Bordo & Meissner, 2012; Botta et al., 2021; Magwedere & Marozva, 2022), but it is not clear whether inequality can also shape the financial sector, particularly credit. Botta et al. (2021) suggested that credit extension is good for economic growth, but it is often accompanied by the costs of more unequal and economically unstable societies.

A cocktail of debt and higher inequality can result in economic stagnation. Academics have highlighted that an upsurge in household debt is linked to a heightened risk of a financial crisis and slowing economic growth (Jordà et al., 2016; Mian et al., 2017; Magwedere & Marozva, 2023) but fell short of linking the role of natural resources to the credit inequality nexus. Furthermore, it has been argued that disparities in access to credit are a determinant of income inequality. However, there is thin literature on the role of inequality and natural resources on credit dynamics. In the finance literature, there is mobilisation on financial access, and literature is silent on the effects of the credit channel-inequality outcomes when natural resources are included as a joint determinant of private credit. Countries endowed with natural resources have been muted to have a natural resource curse such that financial development is low and income inequality in such countries is high (Beck, 2012).

This paper contributes to the literature on the financial effects of inequality by examining both theoretical and empirical perspectives on the nexus between private credit, inequality and natural resource rents. Although the literature has examined the relationship between finance and inequality, it has focused more on financial development and financial inclusion, i.e. how these financial dimensions shape income inequality (Demirgüç-Kunt & Levine, 2009; Zhang & Naceur, 2019; Rewilak, 2017). The potential link between credit and inequality is not a new topic in finance or economics, but the role of natural resources rents in this relationship has been overlooked (Kumhof et al., 2015; Stiglitz, 2016; Cardaci, 2018). The question that arises is whether credit is associated with inequality and natural resource rents. The pursuant of economic growth in low- and medium-income countries is creating challenges to the three pillars of sustainability, namely economic, social and environmental. Hence, this study aims to examine the credit-inequality nexus and also include income from natural resources as a determinant for credit in low and medium-income countries.

The remaining sections of the paper are organised as follows. Section 2 discusses both the theoretical and empirical review of the nexus between credit, income distribution and natural resources. The methodology and data

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description is discussed in Section 3. The results on credit and inequality nexus are presented in Section 4, whilst Section 5 concludes the study and provides a summary of the policy implications.

An overview of the literature

Levine (2005) argued that finance disproportionately exerts an effect on income inequality through the access and use of credit. Theoretical channels that explain the nexus between inequality and credit exist. Galor and Zeira (1993) argued that the presence of market imperfections in credit extension amplifies income inequality. However, if the credit expansion is accompanied by the relaxation of the credit constraints, more financing opportunities in the full spectrum of poor households tighten income inequality (Banerjee & Newman, 1993; Galor & Zeira, 1993). The asymmetric information between borrowers and lenders affects credit availability (Levine, 2005; Stiglitz, 2012; Ferri et al., 2019). Due to the impact of information in the enforcement of credit contracts, lenders often require collateral (Malinen, 2016; Ioannidou et al., 2022). Additionally, credit rationing by lenders is traditionally based on the probability of repayment (Delis et al., 2021). Predatory rent-seeking behaviour at the top can result in predatory lending policies and abusive credit card practices (Stiglitz, 2012). In other financial literature, it has been argued that rising inequality can result in credit booms (Kumhof & Rancière, 2010; Rajan, 2010).

In the resource absorption hypothesis, it is suggested that natural resource wealth can increase the demand for financial services through financial deepening (Beck & Poelhekke, 2022). Booms in natural resources wealth reduce borrowing constraints by increasing collateral and increasing the public demand for credit (Mansoorian, 1991; Manzano & Rigobon, 2007). However, the financial resource curse hypothesis contends that natural resource wealth undermines the development of the financial system if the resource wealth ends up in offshore conduits (Andersen et al., 2017). Furthermore, it is suggested that natural resource wealth increases rent-seeking behaviour and waste (Murphy et al., 1993; Torvik, 2002). Theoretically, there is no conclusion on the role of natural resources on credit. Sachs and Warner (1997) observed that countries endowed with natural resources have slower rates of economic growth, which in turn affects the availability of credit.

In another theoretical strand, Stiglitz (2009) argued that stagnating real income challenges force low and medium-income households to borrow to preserve their standard of living, and Kumhof et al. (2015) concurred with this theoretical assertion. The study observed that during the periods 1920-1929 and 1983-2008 in the United States, there was a convergence of high

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leverage and high-income inequality. Keeping up with the Joneses can result in low-income households demanding extra credit so as to reduce consumption gaps with high-income households (Frank, 2005; Kumhof et al., 2015). Rising inequality can directly lead to credit-led consumption and asset price boom and increasingly mounting household indebtedness (Rajan, 2010; Fitoussi & Saraceno, 2010; Magwedere & Marozva, 2023). Inequality is a source of macroeconomic fluctuations, which include excessive borrowing by households (Kumhof et al., 2015). Income increases to the top earners are not channelled to increase consumption, but rather, the income is lent to low-income households (Carroll, 2000; Rajan, 2010). Schularick and Taylor (2012) coincided with these findings as they found that soon after the Second World War, there was a positive relationship between inequality and leverage as increasing inequality converged with high household debt-to-income ratios. That is, the differences in relative consumption can increase private lending to households (Malinen, 2016).

Furthermore, Rajan (2010) proposed a political economy channel to explain the credit-inequality nexus. Rising inequality can result in populist policies as politicians institute policies that accommodate low and middle-income earners as they seek to maintain their voter base. In this regard, easy credit is encouraged to keep demand and job creation more robust than the reversal of income inequality. In the United States, subsidised housing lending was instituted to improve the situation of low- and middle-income earners (Malinen, 2016). In a bid to contain depressed aggregated demand, central banks may cut interest rates, which simultaneously trigger the search for high-yield investments by high-income earners, driving asset bubbles through the accumulation of private debt (Stockhammer, 2015; Fitoussi & Saraceno, 2010; Cardaci & Saraceno, 2019). From the theoretical perspective, natural resources can aid the credit extension by the financial sector if the natural resources rents are deposited in the domestic economy (Beck & Poelhekke, 2022). In a nutshell, the level of inequality and natural resource rents have implications on the size and vulnerability of the financial sector, particularly private credit.

Dynamic debates on the foundations of rising inequality and the appropriate processes to contain the problem have remained inconclusive. Fischer et al. (2019) opined that although the credit and inequality nexus can be ambiguous in high-income countries, the quality of regulation helps to determine the overall outcomes. Previous studies argue that inequalities can contribute to credit cycles and financial instability; Malinen (2016) found a positive elasticity between inequality and bank credit. This contradicts the finding of Bordo and Meissner (2012), who found that little evidence exists to link the credit boom to income inequality. Rajan's (2010) finding suggested that inequality is a determinant of private credit as inequality determines the

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dynamics in the credit market. Fischer et al. (2019) argued that the links between inequality and credit are ambiguous as it is determined by the level of the respective countries' aggregate income. These studies did not link the credit-inequality nexus to natural resources rent. In studies that link natural resources and the financial sector, Beck and Poelhekke's (2022) findings suggested that a natural resource curse in finance can exist if the windfall in natural resources is not expected. It was argued that natural resource abundance could result in a decline in financial deposits and a decline in the volume of private-sector lending. However, the study did not link the credit aspect of finance to the natural resource rent and income inequality. Van der Ploeg and Poelhekke (2009) and Bhattacharya and Hodler (2014) found that natural resource rent in underdeveloped financial systems increases macroeconomic volatility, and the studies fell short of linking this relationship to inequality.

However, Bhattacharyya and Hodler (2014) concurred that in the absence of strong institutions, resource wealth hinders financial development, which is a key channel for inequality reduction in low and medium-income countries. Dwumfour and Ntow-Gyamfi (2018) found a positive relationship between natural resources and credit use, although the study concluded that the relationship is contingent on the measure used for the development of the financial sector. It was further commented that countries with higher natural resource rents are prone to macroeconomic challenges (Dwumfour & Ntow-Gyamfi, 2018; Beck & Poelhekke, 2022). Additionally, it has also been observed that countries with similar natural resources rents as a percentage of gross domestic product have significantly different developmental outcomes (Carmignani, 2013). Kumhof and Rancière (2010) and Rajan (2010) suggested that income inequality drives the demand for credit and generates macroeconomic damages. Bazillier and Hericourt (2017) argued higher inequality can contribute to greater leverage if the regulatory framework is weak. In alternative studies that linked the natural resources and financial system, it was observed that countries rich in non-renewable resources have limited capacity of converting the natural resources to productive financial assets (Van der Ploeg & Venables, 2012; Beck & Poelhekke, 2022).

Van der Ploeg (2011) suggested that even in the presence of strong institutions, investments in natural resource-rich countries have negative social ramifications such that income redistribution is affected in a less efficient manner. Pouokam (2021) concurred with these arguments and opined that natural resource-rich countries have opaque public finances, creating rent-seeking opportunities such that policies are instituted to advance personal interest, resulting in negative externalities. Delis et al. (2021) opined that credit-constrained households have inadequate capital, and their exclusion from credit can obstruct economic suppleness and fuel persistent

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income inequality. Loan origination and loan granting decisions favour the soft information held by a financial institution such that income distribution is tighter for businesses and individuals with accepted loan applications as compared to individuals with rejected loan applications. The literature argues for the role of credit in reducing income inequalities, but there is a gap in the literature on the role of income inequality on credit. Botta et al. (2021) suggested the existence of reverse causality between inequality and credit. Fitoussi and Stiglitz (2009) opined that financial fragility emanates from structural roots that borders around income distribution as household maintain consumption constant by taking on debts.

Data and Methodology

Data and measurements

The period of the study was solely determined by the availability of the data for all the cross-sections (countries)[1] and the time series. Annual panel data from 2002-2021 was used to examine whether inequality and natural resource rents have an effect on credit extension in low and medium-income countries. Inequality data was extracted from the Standardized World Income Inequality Database (SWIID); for all the other variables, the World Development Indicators and the World Governance Indicators databases of the World Banks were used to extract the data. The description of the variables used in the study definitions and sources of data are summarised in Table 1.

Table 1. Variable description, definition and data sources

Variable	Definition/Measurement	Source	Expected Sign
Credit (CRDT)	Private domestic credit from deposit banks and other financial institutions (% of GDP).	WDI	
Inequality (INEQ)	The ratio of the mean absolute difference between two individuals or entities to twice the mean level of income i.e. it is a measurement of the income distribution of a country's residents.	SWIID (Solt, 2020)	Positive/ Negative
Natural Resources rent (NATRENT)	Total natural resources rent (% of GDP).	WDI	Positive
Economic growth (GDPg)	The annual growth of the gross domestic product.	WDI	Positive/ Negative(+/-)

1 Algeria, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central Africa Republic, Cote d'Ivoire, Egypt, Eswatini, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Libya, Madagascar, Mali, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tunisia, Zimbabwe.

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Variable	Definition/Measurement	Source	Expected Sign
Trade Openness (TRADE)	The ratio of imports and exports to GDP.	WDI	Positive/ Negative(+/-)
Unemployment (UNEMP)	The total number of the unemployed labour force as a percentage of the total labour force.	WDI	
Regulatory quality (RegQ)	Regulation quality (estimate): "measured as the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development".	WGI	Negative (-)
Control of Corruption (CCORR)	Control of corruption (estimate): "Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as „capture" of the state by elites and private interests".	WGI	Negative

Notes: Standardized World Income Inequality Database. WDI: World Bank Development Indicators of the World Bank. WGI: World Governance Indicators of the World Bank.

Estimation technique

The purpose of this study is to determine the effect of inequality on credit and examine if the role of natural resources matter for credit-inequality nexus. The system generalised method of moments (s-GMM) is the appropriate methodology to examine the credit inequality nexus controlling for natural resources rents as credit can be persistent. However, the inclusion of the lagged dependent variable as an explanatory variable can result in endogeneity issues. Furthermore, inequality in low and medium-income countries is also persistent. It is this persistent nature of some of the variables used in this study that renders the s-GMM as the preferred method for this study as it accounts for any potential endogeneity bias and the method controls for the persistence of the variables (Arellano & Bover, 1995; Arellano, 2003). Additionally the macroeconomic fundamentals can simultaneously determine credit, inequality and natural resources rents. Irrespective of the faultless nature of the first-difference GMM in eliminating the fixed effect and time-invariant regressors, Blundell and Bond (1998) opined that when the series is highly persistent the method is biased and has poor finite sample properties.

Therefore to remedy for the finite sample bias of the traditional first difference the s-GMM is used as it adds additional moment restrictions and restricts the lagged first differences which are used as instruments in the levels equation. These qualities have proved that the system GMM is superior to the first difference GMM (Arellano & Bover, 1995; Blundell & Bond, 1998; Bond et al., 2001). Moreover, the system GMM controls for (1) the unobserved heterogeneity with time-invariant omitted variables and (2) simultaneity in

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all regressors by employing instrumented explanatory variables (see Boateng et al., 2018; Odhiambo, 2020). Internal instruments were included to controls for the reverse causality. The system GMM technique further advantage is that it uses the panel data structure, which assists in controlling for the time-invariant unobserved heterogeneity and cross-country variations (Blundell & Bond, 1998). Roodman (2009) forward orthogonal technique was employed to control for instrument proliferation which emanates from over fitting the model. The further benefit of the system GMM is that the use of external instruments other than the already included explanatory variables is not a requirement.

The study ensured that the diagnostics of the system GMM for instrument validity and the test for second-order serial correlation are satisfied (Arellano & Bond, 1991). Thus, the absence of autocorrelation in the residuals was tested consistent with the Arellano-Bond test (AR1) and (AR2) (see Arellano & Bond, 1991; Windmeijer, 2005; Roodman, 2009). As there is a likelihood of endogeneity in the explanatory variables, cross-section dependence was also tested consistent with De Hoyos and Sarafidis (2006) and Pesaran (2021). It is necessary when the GMM method to be attentive and alert on the possibility of instrument proliferation that could conceivably over fit the endogenous variables. Thus, the technique used has to pass both the test for instrument validity and second-order serial correlation. Thus the validity of using the system GMM was confirmed using Sargan (1958) and Hansen's (1982) over-identifying restrictions. Following Asongu and De Moor (2017) and Odhiambo (2020), instrument proliferation was limited by ensuring that the number of instruments is not more than the number of cross sections (countries).

Therefore the study estimated equation 1:

$$\Delta \mathrm{CRDT}_{it} = \beta_0 + \Delta\beta_1 \mathrm{CRDT}_{it-1} + \sum_{i-1}^{n} \beta_{ij} \Delta \mathrm{INEQ}_{j,it} + \quad (1)$$

$$+ \sum_{i-1}^{n} \beta_{ij} \Delta \mathrm{NATRENT} + \sum_{i-1}^{n} \beta_{iq} \Delta \mathrm{X}_{q,it} + \Delta\mu_i + \Delta\varepsilon_{it}.$$

where:

Δ – is the difference operator,

CRDT – is the private credit as a percentage of gross domestic product, changes in credit can be persistent hence a lagged dependent variable was included in the independent variables,

INEQ – is the GINI coefficient showing the distribution of income the subscript i and t being the country and time respectively, the natural resources rents (NATRENT),

X – represents a vector of control variables which include gross domestic product growth (GDPg), trade openness (tradeOP), the estimate of the regulatory quality (regQ), control of corruption (CCORR) and lastly unemployment (UNEMP) captures the cross-country heterogeneity,

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ε_{it} – represent the unobserved regression residual.

Equation 1 was estimated using the Roodman (2009) technique, where forward orthogonal deviations are used to restrict over-identification or limit instrument proliferation. Consistent with Bruno et. al. (2012); Asongu and Odhiambo (2020) the number of control variables was limited to avoid estimations that do not pass the post-estimation diagnostics of instrument proliferation.

Results and discussion

The results and a discussion thereof are presented in this section.

Descriptive statistics

Table 2. Descriptive Statistics

Variables	Mean	Median.	Maximum	Minimum	Std. Dev	Obs
PCREDIT	24.86871	15.83484	142.4220	0.000000	25.91321	619
INEQ	0.452386	0.436409	0.659063	0.317484	0.072541	619
NATRENT	9.843917	7.027306	67.88997	0.001172	10.07008	619
CCORR	-0.520283	-0.629166	1.633352	-1.581135	0.670152	619
GDPg	3.781328	4.237781	86.82675	-50.33852	6.616158	619
REGQ	-0.568969	-0.544541	1.196947	-2.282205	0.626437	619
TRADEOP	66.53622	57.82929	342.4870	0.784631	36.12110	619
UNEMP	8.349113	5.648000	33.55900	0.320000	7.087617	619

Source: author's work using Eviews based on Gujarati (2022).

Private credit as a percentage of the respective countries gross domestic product in the countries under study ranges from minimum 0.0 to a maximum of 142.42 with a standard deviation of 25,91. The countries in this sample are among the countries with globally higher level of inequality. The maximum level of inequality is 0,659 with a minimum of 0,317. Estimates of regulation quality and control of corruption in these countries have a minimum of -2,282 and -1.581, respectively. The standard deviation of unemployment is 7,087, and the maximum level of unemployment is 33,559. The average rate of unemployment of 8.349 does not represent the sustainable development goal of decent work and sustainable growth as the target unemployment rate in the sustainable development goals of near zero unemployment (United Nations, 2015).

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Gross domestic product growth is essential for socio-economic benefits in any economy. Gross domestic product growth for the countries in the study ranges from a minimum of -50,338 percent to a maximum of 86,827, which were both recorded in Libya during the war period and the recovery period from the war. The average growth for the countries in the study is 3,78 percent. This is below the average growth rate of 7 percent that is stipulated in the sustainable development goals for low and medium-income countries (United Nations, 2015; Siddiqui et al., 2022). A lower average gross domestic growth rate implies that the countries in the study are falling short of creating economic opportunities vital for reducing inequality and creating decent work for the populace amongst others.

The results of the association between the variables are presented in the correlation matrix in Table 3.

Table 3. Correlation Matrix

	PCREDIT	INEQ	NATRENT	CCORR	GDPg	REGQ	TRADEOP	UNEMP
PCREDIT	1.0000							
INEQ	0.2666	1.0000						
NATRENT	-0.2034*	-0.3874*	1.0000					
CCORR	0.4834*	0.2417*	-0.3206*	1.0000				
GDPg	-0.0931*	-0.0134	0.0373	0.0420	1.0000			
REGQ	0.5727*	0.2866*	-0.4713*	0.8196*	0.0585	1.0000		
TRADEOP	0.2366*	-0.0331	-0.0532	0.5355*	0.0215	0.3617*	1.0000	
UNEMP	0.4580*	0.3292*	0.1257*	0.232473	-0.1009*	0.1808*	0.1431*	1.0000

Source: author's work using E-views based on Gujarati (2022).

There is a negative association between the natural resources rents, inequality and private credit. However, private credit is positively associated with the inequality for the sample of countries in our study. All the variable in the study except for natural resources rents and gross domestic product growth have a positive association with private credit as a percentage of gross domestic product. For regulation quality and corruption the correlation of 0.8196 is higher hence the variables were regressed in separate equations as control variables on the links between private credit, inequality and natural resources rents.

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Empirical Analysis

Table 4 presents the results of the empirical analysis using system GMM are presented. Due to higher correlation between estimate of corruption and the estimate for regulation quality separate equations using these variables were estimated.

Table 4. Credit, inequality and natural resources nexus

Dependent variable is private credit		
Regressors	**SysGMM**	**System GMM**
Pcredit (-1)	0.4003376***	0.2828323***
	(11.90)	(11.07)
ineq	-618.3402***	-174.6893***
	(-8.34)	(-2.87)
natrent	-0.4660765***	-0.2851642***
	(-2.36)	(-5.26)
GDPg	-0.2148801**	-0.0874999***
	(-4.32)	(-3.41)
tradeOP	0.0917282	-0.0256285
	1.55	(-1.09)
unemp	-0.649579**	-0.5080852***
	(-2.34)	(-3.09)
regQ	31.27158***	
	(7.66)	
CCORR		-26.48537***
		(-5.51)
F test p-value	0.0000	0.000
AR(1)	0.213	0.217
AR(2)	0.232	0.230
Sargan OIR	0.864	0.818
Hansen OIR	0.790	0.735
Countries	31	31
Instruments	20	20
Observations	558	558

Notes: *** and ** denote significance levels at 1% and 5%, respectively; AR=autoregressive); OIR=Over-identification restrictions; t-statistic in parenthesis. Values in bold is the significance of the estimated coefficients.

Source: author's work using Stata 15 based on Arellano & Bond (1991); Roodman, (2009).

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Based on the empirical estimation results in Table 4 the results of the four main information criteria used to evaluate the validity of the estimated GMM models: AR(1); AR(2) confirmed the absence of autocorrelation in the residuals. Furthermore Sargan (1958) and Hansen (1982) over-identification restrictions (OIR) tests confirm the validity of the instruments. To control the problem of instrument proliferation the study ascertained that the number instruments are less than the number of groups (cross section) (see: Asongu & De Moor, 2017; Odhiambo, 2020).

Empirically the impact of inequality on credit is not conclusive, for this study a negative and significant relationship between inequality and private credit was found. The study expected a positive relationship between inequality and private credit assuming that in an unequal society borrowing tend to be higher. However, given the nature of the countries in our sample the findings are justified as the countries have a vibrant informal sector which might not rely on the formal financial system to source credit. The negative relationship finding contradicted Iacoviello (2008) and Kumhof et al. (2015), whose finding suggested a positive relationship between inequality and private credit. It is worth noting that Fischer et al. (2019) argued for an ambiguous relationship between inequality and credit as there are other conditions that affect the nature of the relationship. Additionally, finance and inequality literature has been inconclusive on the nature of the relationship (see Altunbaş & Thornton, 2020).

A positive relationship between natural resources rent and private credit was expected, because some empirical findings suggests that the financial sector act as the absorption tool of natural resources windfalls (Beck & Poelhekke, 2022). This study found a negative and significant direct relationship between natural resources and private credit. The negative relationship between natural resources and the ratio of private credit to GDP is contrary to the previous findings of Beck (2012), Bhattacharya and Hodler (2014) who found a positive relationship. The countries in this study are mainly developing countries with small financial sector and weaker regulation quality or control of corruption. Hence a negative relationship between the natural resources rent and private credit can be possible. This finding is in favour of the financial resource curse than the absorption hypothesis. Furthermore Beck and Poelhekke (2022) opined that in developing countries with inefficient financial system natural resources rents may not be absorbed by the domestic financial sector as they are shifted to offshore financial conduits. This may not necessarily create demand for financial products hence a negative relationship between private credit and natural resources rents. Manzano and Rigobon (2007) suggested a positive relationship between natural resource rents and private credit, arguing that as higher natural resource

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rents enter the financial system, this can result in a higher supply of loans to businesses and households.

The shifting of natural resources windfalls to offshore conduits can result in slower growth in lending in the domestic financial sector (Beck & Poelhekke, 2022). An increase in natural resource rents can furthermore lead to more extraction of natural resources and crowding out of the non-resource sector, thereby lowering the demand for external funding (Venables, 2016). Thus, a significant and negative relationship between natural resource rents can suggest that higher natural resource rents can undermine the development of the financial systems as there is less credit demand. This is mostly applicable in economies where the natural resources rents are not absorbed by the domestic financial sector. Additionally, in most low- and medium-economies endowed with natural resources, the natural resource rents are mainly used to fund government consumption rather than being intermediated by the financial sector.

The estimate of regulation quality and control of corruption have a negative and significant relationship with private lending. Countries with weaker governance structures, such as the quality of regulation and the control of corruption, tend to have a repressive financial system that does not necessarily channel the resource wealth in the formal financial system. For the countries in our sample, financial exclusion is inherent; hence, the negative relationship between private lending and inequality can be expected as the less privileged are not catered to by the formal financial sector for credit extension due to lending barriers, mainly lack of collateral.

Conclusions

Existing literature does not offer a conclusive position on the role of natural resources in the credit-inequality nexus. The study finds that greater inequality or higher natural resource rents are associated with lower credit for the countries in this study. This article's aim was to contribute to the debate on the role of inequality and natural resources in shaping credit in low and medium-income countries. Therefore, this study examined the nexus between credit and inequality and natural resource rents of the countries under study. Countries endowed with natural resources have lower private credit and higher inequality levels. Natural resource rents that are not absorbed by the financial sector reduce the availability of private credit, and this suggests natural resource rents and income inequality can reduce the availability of private credit in low and medium-income countries. The integration of environmental outcomes and finance is essential for a holistic approach to dealing with issues that affect the availability of credit from the

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private sector. The results stressed that inequality and natural resources affect private credit dynamics in low and medium-income countries. Further research is recommended on the role of fiscal discipline in the relationship between private credit, inequality and natural resources rent. It is worthwhile to research the effect of fiscal consumption of natural resource rents and how this affects credit availability from the financial sector.

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