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RESEARCH PAPER

'The Financial Resources Curse' Hypothesis in Iraq: Application of ARDL and NARDL Models

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Abstract
In this study, we investigate the relationship between financial development and natural resource rents, examining the 'Financial Resource Curse' hypothesis. This examination is conducted separately for the banking system, the stock market, and the overall financial system in Iraq. The study covers the period from 1990 to 2021 and utilizes annual data sourced from the World Bank. Our analysis employs ARDL and NARDL models to estimate the relationships between these variables, and the DOLS estimator is used to ensure the robustness of the results. Our findings reveal a significant, negative, and statistically significant effect of resource rents on the development of Iraq's banking sector and its financial system as a whole. This outcome supports the 'Financial Resource Curse' hypothesis for these sectors in Iraq during the study period. However, the relationship between resource rents and the stock market development index is not statistically significant, making it difficult to draw conclusions regarding the existence of the financial resource curse in the stock market. Furthermore, improved institutional quality had a positive and statistically significant impact on financial development in both the banking and stock market sectors of Iraq during the study period. The Corruption Index also shows a positive and statistically significant long run effect on banking sector development, supporting the Grease the Wheels Hypothesis. However, it has a negative impact on the development of the stock market and the financial system.
Keywords: financial development, financial resource curse, linear and nonlinear ARDL model, natural resources.
JEL Classification: C32, E44, G1, P48.

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Introduction

Many economists, particularly adherents of conventional growth theories, believed that economic growth and development could be attributed to an abundance of natural resources. However, empirical evidence from as early as the 1950s in some resource-rich countries such as Nigeria, Iran, Venezuela, and Iraq revealed a paradoxical situation. These countries not only failed to harness the benefits of oil and gas revenues but also experienced comparatively slower economic growth and development than countries lacking significant natural resources. This intriguing phenomenon, widely documented in economic literature, is termed the Natural Resource Curse (NRC). It is often described as the "double-edged sword" of natural resource income (Auty, 1993). In theory, an abundance of natural resources should logically lead to economic growth and national development. However, upon closer examination of empirical examples from resource-endowed countries, it becomes apparent that such abundance is not always a blessing; it can also hinder growth and development.

Moreover, in addition to the resource curse—the detrimental effects of natural resource income on economic growth and development—many resource-rich countries face an array of other challenges. These include political and social issues, high levels of poverty and inequality, limited access to education, volatile economic growth, poor institutional quality, and political instability (Sachs and Warner, 2001).

One factor significantly influencing economic growth and sustainable development, and which is itself affected by abundant natural resources, is financial system development. Financial development plays a crucial role in stimulating economic growth, which in turn leads to sustainable development. It does so by providing liquidity services and efficiently channeling savings, resulting in the efficient allocation of resources to productive investments and enhancing overall productivity (Levin, 1997). The abundance of natural resources, particularly a heavy dependence on oil revenues, can influence this relationship in various ways. On the one hand, increased income from natural resource sales can boost financial institutions' income, thereby strengthening the link between financial development and economic growth. However, on the other hand, overdependence on natural resources can negatively affect economic growth. This is primarily due to diminished productivity resulting from a reduced capacity of financial institutions to accumulate capital and allocate it optimally to productive sectors (Nili and Rastad, 2007; Beck, 2011; Yuxin and Chen, 2011).

In summary, natural resource revenues, when channeled through the financial system, play a pivotal role in the economy and directly impact long-run economic growth. Therefore, as integral components of the financial system, the banking sector and the stock market play crucial roles in the prudent management of these revenues to sustain long-run economic growth. However, it is important to reiterate that, as mentioned earlier, natural resource revenues, much like a double-edged sword, can potentially harm the benefiting countries through various channels (Khan et al., 2020).

Within the resource curse literature, the effect of natural resource revenues on financial development is considered a complex issue. Existing evidence suggests that many resource-rich countries exhibit lower levels of financial development, a phenomenon termed the 'financial resource curse' (FRC) by Beck (2011). Conversely, studies such as Wei et al. (2020) report higher levels of financial development in resource-rich countries, such as Thailand, Norway, and Malaysia. As a result, the exploration of the financial resource curse has attracted considerable attention from researchers. Despite numerous studies investigating the impact of natural resource revenues, there is still no clear consensus on whether they represent a curse or a blessing. While studies such as Ali et al. (2022), Amin et al. (2020), Asif et al. (2020), and Dogan et al. (2020) report a negative impact of natural resources on financial development, others like Khan et al. (2020), Faisal et al. (2019), Zaidi et al. (2019), and Shahbaz et al. (2018) highlight a positive relationship.

It is noteworthy that financial development encompasses both the banking sector and the stock market as essential elements of the financial system. Many studies have focused primarily on overall financial development or banking development, often neglecting the role of the stock market (Ali et al., 2022). However, Ito and Kawai (2018) argue that banking sector development does not account for critical factors such as market depth, access, liquidity, and the efficiency of financial markets. Similarly, Khan et al. (2020) suggest that banking-centric metrics fail to grasp the intricacies and distinctions of financial markets, making them insufficient for examining stock market development within the context of overall financial development.

Furthermore, it is essential to note that the financing mechanisms differ between the banking sector and the stock market. In the banking sector, financing is primarily achieved through loans with associated interest costs. In contrast, the stock market relies on share issuance and dividend payments. The existence of a secondary market in the stock market allows investors to realize capital gains

(Ali et al., 2022). Consequently, the stock market facilitates investment allocation, financial resource distribution, and the mobilization of savings for projects with growth potential.

Iraq is recognized as a country rich in natural resources, yet it grapples with myriad economic and social challenges, including unemployment, poverty, inequality, and an underdeveloped financial sector. This raises a fundamental question: whether there is a relationship between the abundance of natural resources and financial development in Iraq? Furthermore, given the financial system's pivotal role in resource allocation, how does natural resource abundance impact its various components, such as the banking sector and the stock market in Iraq? The answers to these questions are crucial for formulating informed policies aimed at fostering economic growth and development in the country.

To address these critical issues, this study explores the relationship between natural resource abundance and financial development in Iraq. We employ diverse indicators of financial development and a range of time-series econometric methods using annual data from 1990 to 2021. The remainder of this paper is structured as follows. Section 2 reviews the theoretical underpinnings and relevant literature. Section 3 describes the data sources and methodology. Section 4 presents the empirical results. Finally, Section 5 concludes with policy recommendations.

Literature Review

In mainstream economic literature, natural resource income is often cited as a pivotal factor in driving economic growth. These revenues, when channeled through the financial system—which encompasses both the banking sector and the stock market—contribute to increased demand for financial services and foster economic growth. Nonetheless, the performance of natural resource-rich countries often reveals a perplexing trend, where some exhibit lower economic growth rates than their counterparts with fewer natural resources. This phenomenon underscores that natural resource income can foster rent-seeking behavior, corruption, and Dutch disease, ultimately impeding financial development. This conundrum is often referred to as the natural resource curse in economic literature (Ali et al., 2022). Recent economic literature has introduced theoretical frameworks to investigate the influence of natural resource abundance or dependence on various economic aspects, including the financial system. This growing body of research has yielded conflicting predictions regarding financial development in countries with abundant natural resources.

Beck (2011) explores the impact of natural resource abundance on financial development, considering both supply and demand aspects. From the demand side, natural resource abundance can have both positive and negative effects on the financial sector in resource-rich countries. When wealth generated from natural resources is deposited and invested domestically, it can increase financial system income, particularly in the banking sector, through higher deposits. Additionally, this wealth can lead to increased demand for loans, especially consumer loans, further deepening the financial system. However, there are potential drawbacks for the financial sector in resource-rich countries. Windfall profits might be channeled out of the domestic financial system into foreign investments, government investments abroad, or non-financial assets. This capital outflow can be more pronounced in countries with inefficient financial systems. Furthermore, the non-financial sector might be negatively affected due to issues such as unsustainable resource extraction, reduced demand for foreign financing, and substitution effects. From the supply side, natural resource abundance can also have adverse effects. It might discourage skill development and investments in the financial sector due to a substitution effect. In essence, the extent of financial integration in resource-abundant countries depends heavily on financial system efficiency and a strong institutional framework, including robust financial contracts, which can either hinder or promote financial development (Beck, 2011). Beck (2011) examined the 'resource curse' in the context of financial development, empirically demonstrating that countries with significant natural resources tend to have less developed financial sectors. Guan et al. (2020) studied developing economies and found that natural resource income negatively affects banking sector development, thereby confirming the resource curse hypothesis for developing nations. However, Dogan et al. (2020a) found that in developed countries, natural resource revenues had a positive impact on financial development. Their study also suggested that financial development resulting from natural resource revenues can drive economic growth. This process involves the banking sector facilitating increased lending, contributing to both financial development and economic growth. It is worth noting that most studies in this field have primarily focused on oil revenues rather than natural resources as a whole. Only a few studies, such as Moradbeigi and Law (2017), have explored the relationship between oil sector income and stock market development. Their research indicated that channeling oil revenues into financial markets increases profitable investment opportunities, reduces the adverse effects of oil revenues on the economy and financial markets, and encourages growth. Similarly, Muhamad et al. (2020) showed that in oil-producing countries, economic growth from government and private investments in the oil sector is more likely when the stock market is highly developed.

Auty (1993) pointed out that while many countries experienced the resource curse with increased natural resource income, some managed to benefit from this income surge. Hence, the phenomenon of the natural resource curse isn't an inflexible law; rather, it's a probable occurrence. Therefore, the abundance of natural resources isn't the sole determining factor in financial development. Economic management and institutional quality are equally crucial (Aghaei et al., 2023). Mehlum et al. (2006) argued that institutional quality plays a pivotal role in shaping the impact of natural resource revenues. In nations with weak institutional quality, these revenues can fuel corruption and rent-seeking. In contrast, in countries with high institutional quality, such revenues can be channeled into productive economic activities, turning natural resources into a blessing. Atkinson and Hamilton (2003) suggested that without a proper institutional framework, especially in countries with low savings, natural resource rents might be used for public spending rather than investment, which impedes development. However, Leite and Weidman (1999) demonstrated that in the presence of suitable institutions, financiers are more likely to provide financial resources in the form of facility contracts. When financiers have confidence in these contracts, they are less risk-averse. In developing countries heavily reliant on natural resources, the rule of law and institutional quality are often weaker, leading to increased rent-seeking and corruption. Bhattacharyya and Hodler (2014), studying 133 countries between 1970 and 2005, found that in nations with weak political institutions, natural resource rents served as an impediment to financial development. They argued that establishing democracy in resource-rich countries could promote financial development. Narayan et al. (2015) revealed that economic rents resulting from natural resource ownership can foster corruption opportunities. This corruption erodes trust in government policies. Consequently, despite corruption and rent-seeking by government officials, there is no incentive to invest natural resource revenues in high-yielding stock market activities. Feng and Yu (2021) emphasized the role of institutional quality in determining the level of financial market development. They argued that in economies with transparent laws protecting investor rights and private property, natural resource revenues can lead to prosperous and developed financial markets. Khan et al. (2020) arrived at similar conclusions for Pakistan. They demonstrated that strong institutions in the country can mitigate the adverse effects of natural resource revenues, fostering the development of financial markets. In the absence of a robust legal framework, due to the distrust of depositors, financial markets lose their capacity to mobilize resources, resulting in capital flight and limited domestic investment opportunities. In essence, inadequate institutional quality undermines financial markets and disrupts economic growth.

The relationship between financial development and the abundance of natural resources has been explored in numerous studies, yet none of these studies have yielded a definitive conclusion in this field. This is likely due to the fact that the relationship between these two variables can vary between countries, depending on the indicators used to measure financial sector development and the methodology applied in estimating the relationship. For instance, Nurmakhanova et al. (2023) conducted a recent study focusing on a selection of African countries. They used a panel data model to analyze data from 1995 to 2020 and found that natural resource abundance had a strong negative impact on two financial development indicators: investment in the stock market and credit availability to the private sector in their sample. However, Dwumfour and Ntow-Gyamfi (2018), in their study of African countries spanning from 2000 to 2012, concluded that the impact of natural resource abundance on financial development in African countries is ambiguous and varies depending on the financial development indicators considered. Chaudhry et al. (2021) also explored the non-linear relationship between financial development and natural resource abundance using seasonal data from Saudi Arabia for the years 1985 to 2017. Their findings indicated that while there was non-linear behavior between the two variables, natural resource abundance had a positive short-term effect on financial development, while this effect turned negative in the long-run. Guan et al. (2020) examined the empirical relationship between natural resource abundance and variables such as economic growth and human capital on financial development in China from 1971 to 2017. Their results suggested a one-way causality relationship between financial development and natural resource abundance in China. Another group of studies in this field acknowledges the positive impact of natural resource abundance on financial development. For example, Ali and Ramakrishnan (2022) investigated the effect of natural resource abundance on financial development in Malaysia from 2002 to 2018 using the bootstrapped ARDL method and found that natural resource abundance had a positive effect on financial development in Malaysia. Hussain et al. (2021) also showed in their study that natural resource abundance had a positive effect on financial development in 23 selected countries with natural resources and high per capita income. Asif et al. (2020) explored the impact of natural resource abundance on financial development in Pakistan from 1975 to 2017. Their results indicated that natural resource abundance had a positive short-term effect and a negative long-term effect on financial development in Pakistan. Given the variations observed in these studies, it's clear that the relationship between financial development and natural resource abundance can differ from one country to another based on each country's specific economic conditions and structure. Hence, it's necessary to investigate this relationship on a country-by-country basis, taking into account its unique circumstances. This study differs from previous research by employing time series models to examine this relationship in the context of Iraq. Additionally, it investigates the impact of natural resource abundance on various financial development indicators, including the development of the banking sector, the stock market, and the entire financial system, which hasn't been widely explored in prior studies.

Methods and Materials

In this study, the impact of natural resource abundance on financial development is investigated by considering other variables affecting the demand for financial services, such as gross domestic product, institutional quality, and corruption. Natural resource abundance can affect financial development through various channels, such as the transfer of production factors from the tradable and productive sectors to other sectors, rent-seeking, corruption, and the reduction of financial services and investment. An increase in GDP, by expanding investment opportunities, will also lead to increased demand for various services, including financial services, thereby fostering financial development (Shahbaz, 2018). Improving institutional quality, particularly in institutions and infrastructure related to the financial sector, creates a competitive environment, facilitates the entry of foreign and domestic investors, increases demand for financial services, and can thereby enhance financial development. Given the prevalence of rent-seeking and corruption in resource-rich countries, and the emphasis on transparency in extractive industries to combat corruption (Okada and Shinkuma, 2022), corruption is included as a variable that can affect financial development. This is supported by theoretical foundations and previous studies such as Ali et al. (2022), Nurmakhanova et al. (2023), Beck (2011), Chaudhry et al. (2021), Khan et al. (2020a), and Shahbaz et al. (2018). Equation (1) is used to investigate the effect of natural resource abundance on various financial development indicators and to test the financial resource curse or blessing hypothesis in Iraq.

$$FD = \text{f}(\text{NNR}, \text{GDP}, \text{IQ}, \text{COR}) \quad (1)$$

Following previous studies such as Ahmed et al. (2016) and to obtain consistent and reliable results, all variables in Equation (1) are transformed into logarithmic form. Log transformation smoothens the changes in variables and allows the estimated coefficients to be interpreted as elasticities, facilitating their interpretation. Therefore, the empirical model of the research, considering the logarithmic form of the variables, is:

$$LnFD_{it} = \alpha_0 + \alpha_1 LnNRR_t + \alpha_2 LnGDP_t + \alpha_3 COR_t + \alpha_4 LnIQ_t + \varepsilon_t \quad (2)$$

In this equation, FD is the dependent variable, representing the financial development index, where i denotes the various financial development indicators used in the research (i = 1 to 3). To compare the resource curse hypothesis for the stock market and the banking system, separate indices for banking sector development and stock market development are constructed using the PCA method, based on various related indicators. Each index is then used separately in model estimation. Additionally, to test the financial resource curse hypothesis for the entire financial system, a total financial development index is obtained by combining these two indices (Pradhan et al., 2014; Pradhan et al., 2017; Svirydzenka, 2016).

NNR, indicates the index of natural resources' abundance, which according to the studied sample, this index indicates the oil rent, which its amount is obtained from the difference between the value of crude oil production at world prices and the total cost of production. The higher value of this number indicates the greater dependence of the country on oil resources.

IQ, represents the institutional quality index. Institutional quality is a multidimensional concept that cannot be captured by a single index. Therefore, to measure this index accurately, six worldwide governance indicators from the World Bank are used: government stability and effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, and accountability. These sub-indices are combined using the PCA method to construct a single institutional quality index (Dogan et al., 2020a).

GDP represents gross domestic product at constant prices, with 2010 as the base year.

COR, represents the corruption index, measured by the 'Control of Corruption' indicator compiled by the World Bank. Natural resource rents can foster corruption in government and the private sector, as well as distort resource allocation, reducing economic efficiency and increasing social inequality. Natural resources facilitate rent extraction and, rather than promoting productive activities, lead to competitive rent-seeking (Torvik, 2002).

t represents time, α_0 is the intercept term, and ε_t is the error term.

The relationship between the explanatory variables and financial development in Iraq is estimated using annual data from 1990 to 2021. According to the research model and various indicators of financial development (banking development index, stock market development index and total financial development index) used in the model, the variable coefficients of natural resources rents in each model indicate the presence or absence of the stock market resources curse, system banking and the entire financial system.

Table 1. Variables Definition

Variable	variable explanation (sub-indexes)	Source
Corruption (COR)	Control of Corruption indicator compiled by the World Bank. This index reflects the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as the capture of the state by elites and private interests.	World Bank
Banking Development Index (FDB)	A composite index constructed using the PCA method based on banking sector indicators such as domestic credit to the private sector by banks (% of GDP), domestic credit to the private sector by financial institutions (% of GDP), and broad money (M2) as a percentage of GDP.	World Bank
Stock Market Development Index (FDS)	A composite index constructed using the PCA method based on stock market indicators such as market capitalization of listed domestic companies (% of GDP), stocks traded (% of GDP), and stock market turnover ratio.	World Bank
Total Financial Development Index (TFD)	A comprehensive financial development index obtained by combining the Banking Development Index and the Stock Market Development Index using the PCA method to represent the overall development of the financial system.	World Bank
Natural resources rent (NRR)	Oil rents as a percentage of GDP, measured as the difference between the value of crude oil production at world prices and the total cost of production. A higher value indicates greater dependence on oil resources.	World Bank
Economic Growth (GDP)	Gross Domestic Product at constant 2010 prices, representing the level of economic activity and growth in the economy.	World Bank

Institutional Quality (IQ)	A composite index constructed using the PCA method based on six Worldwide Governance Indicators: government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, voice and accountability, and control of corruption.	World Bank

Source: Research finding.

Table (2) presents a summary of descriptive statistics for the model variables. The results show that among the various indicators of financial development, the highest fluctuation according to the standard deviation of the data during the period under review is related to the banking development index. According to the probability value of the Jarque-Bera statistic, the distribution of observations for the banking development index, the total financial system development index, and gross domestic product do not follow a normal distribution.

Table 2. Variables Descriptive Statistics

	Banking Development Index	Stock Market Development Index	Financial Development Index	Institutional Quality	Corruption	GDP	Natural resources rent
Mean	2.640883	15.04684	-1.254836	-1.48E-16	0.917392	8.204735	3.775007
Median	2.837582	14.70155	-1.237874	1.134930	1.342277	8.257045	3.819455
Maximum	3.842811	16.56898	-1.078810	2.037490	2.212071	8.497770	4.179275
Minimum	-0.341576	13.72255	-1.560648	-3.120600	-1.385802	7.575368	3.139019
Std. Dev.	1.099646	0.906262	0.107907	1.091031	1.116855	0.252740	0.249072
Skewness	-1.386037	0.316571	-1.079049	-0.603106	-0.754262	-1.204786	-0.509466
Kurtosis	4.235777	1.652095	4.534933	1.638038	2.338600	3.590009	3.191087
Jarque- Bera	10.36298	2.494931	7.890076	3.723622	3.052231	6.923418	1.209078
Probability	0.005620	0.287232	0.019350	0.155391	0.217378	0.031376	0.546326
Sum	71.30384	406.2647	-33.88058	-4.00E-15	24.76959	221.5278	101.9252
Sum Sq. Dev.	31.43974	21.35410	0.302744	109.2843	32.43149	1.660820	1.612957
Observations	32	32	32	32	32	32	32

Source: Research finding.

Note: all variables except the institutional quality (due to having negative value) are in logarithmic form.

Table 3. Correlation Coefficients

	Banking Development Index	Stock Market Development Index	Financial Development Index	Institutional Quality	Corruption	GDP	Natural resources Rent
Banking Development Index	1.00						
Stock Market Development Index	0.82	1.00					
Financial Development Index	0.71	0.42	1.00				
Institutional Quality	0.85	0.81	0.62	1.00			
Corruption	0.81	0.81	0.45	0.87	1.00		
GDP	0.84	0.75	0.52	0.60	0.54	1.00	
Natural resources Rent	0.33	-0.04	0.43	0.18	0.18	0.19	1.00

Source: Research finding.

Table 4. Unit Root Test

	Ng-Perron test						DF-GLS test			Kwiatkowski-Phillips-Schmidt-Shin test		
Variable	**Optimum lag**	**Mza**	**MZt**	**MSB**	**MPT**	**Integration degree**	**DF-GLS statistic**	**Optimum lag**	**Integration degree**	**KPSS**	**Optimum lag**	**Integration degree**
FDB	0	0.13631	0.08239	0.57035	23.176	I(0)	-0.301159	0	I(1)	0.777365	3	I(0)
TFD	0	-3.99632	-1.20365	0.33544	6.2546	I(0)	-1.959028	0	I(0)	0.760513	3	I(0)
FDS	0	1.42342	0.66713	0.47561	21.432	I(0)	0.445105	0	I(1)	0.529878	2	I(0)
NRR	0	-4,75134	-1.53940	0.33354	5.1022	I(0)	-2.019353	0	I(0)	0.128036	2	I(1)
GDP	0	-2.44657	-1.01705	0.42456	9.5153	I(0)	-1.541584	0	I(1)	0.662436	3	I(0)
IQ	0	-0.17596	-0.13482	0.75158	3.3097	I(0)	-0.968154	0	I(1)	0.515398	3	I (0)
COR	0	-12.8526	-2.48490	0.10376	2.1452	I(0)	-4.546064	0	I(0)	0.183872	3	I (1)

Source: Research finding.

Table 5. The results of the Long-Run relationship test and other diagnostic statistics

	Model	Estimated model	Optimal lag	F statistic pesaran	Normality test	Heterogeneity variance test statistic	Autocorrelation test	Ramsey test
ARDL modeling	**Model 1**	FDB= f (IQ, COR, GDP, NNR)	(1,0,1,1,1)	6.4990 *	3.4587 (0.969)	1.971172 (0.6160)	0.074756 (0.3585)	2.040980 (0.1246)
	Model 2	FDS= f (IQ, COR, GDP, NNR)	(1,0,1,1,0)	11.7245 *	0.425089 (0.865)	1.898757 (0.1749)	0.529166 (0.5423)	88.33956 (0.4057)
	Model 3	TFD= f (IQ, COR, GDP, NNR)	(1,0,0,0,0)	6.3556 *	1.726294 (0.456)	1.578870 (0.415)	2.6247 (0.2080	0.7450 (05440)
NARDL modeling	**Model 1**	FDB= f (IQ, COR, GDP, NNR^{+}, NNR^{-})	(1,0,1,0,1)	7.4890 *	3.4698 (0.978)	1.85642 (0.7760)	0.98456 (0.4385)	2.040980 (0.1246)
	Model 2	FDS= f (IQ, COR, GDP, NNR^{+}, NNR^{-})	(1,0,0,0,0)	9.7909 *	0.43409 (0.8768)	1.7865 (0.1658)	0.4146 (0.4323)	88.33956 (0.4057)
	Model 3	TFD= f (IQ, COR, GDP, NNR^{+}, NNR^{-})	(1,0,0,0,0)	7.3676 *	1.82347 (0.4786)	1.67053 (0.5265)	2.6177 (0.1970	0.6340 (0.433)

Source: Research finding.

Table 6. ARDL Model Estimation

Short-term estimation								
Dependent variable: Banking Development Index(FDB)			**Stock Market Development Index variable Dependent(FDS):**			**Total Financial Development :Dependent variable IndexTFD**		
Variables	coefficient	Probability	Variable	coefficient	Probability	Variable	coefficient	Probability
LNFDB (-1)	0.582749 (2.85012)	0.0122	LNFDS (-1)	0.182753 (5.695653)	0.0001	LNTFD (-1)	0.1387 (1.990530)	0.0581
IQ	0.501419 (0.82121)	0.5794	IQ	0.06468 (0.45013	0.7311	IQ	0.02500 (2.200115)	0.0387
LNCOR	0.2760 (2.3558)	0.0317	LNCOR	-0.3398 (-2.6187)	0.0178	LNCOR	-0.4992 (-1.9701)	0.0522
LNCOR (-1)	0.2760 (0.3558)	0.7804	LNCOR (-1)	-1.5091 (-2.4787)	0.0239	-	-	-
LNGDP	-0.50141 (-05682)	0.5782	LNGDP	1.1981 (0.62121)	0.5494	LNGDP	0.026710 (0.607652)	0.4984
LNGDP (-١)	0.002594 (1.4079)	0.1795	LNGDP (-1)	0.2416 (1.2159)	0.2467			
LNNNR	-0.06325 (-2.7036)	0.0163	LNNNR	0.36422 (0.86819)	0.4027	LNNNR	0.08069 (1.7397)	0.1001
LNNNR(-1)	0.14030 (1.1240)	0.2787	-	-	-	-	-	-
c	0.0789 0.4786	0.6435	c	0.5457 (0.5824)	0.5715	c	0.1753 (0.261)	0.8043
Error Correction Term (ECT)	-0.47086 (-4.3887)	0.0004	Error Correction Term (ECT)	-0.43871 (-4.4634)	0.0004	Error Correction Term (ECT)	-0.3130 (-5.336514)	0.0001
long-run estimation								
Variables	coefficient	Probability	Variables	coefficient	Probability	Variables	coefficient	Probability
c	O.81223 (4.227047)	0.0372	c	0.027421 (0.1595)	0.8729	c	0.026421 (0.150485)	0.8829
IQ	0.394574 (3.464804)	0.0435	IQ	0.540338 (0.3578)	0.7242	IQ	0.315738 (2.332040)	0.0322
LNCOR	0.2760 (1.3558)	0.2449	LNCOR	-0.3398 (-2.6187)	0.0178	LNCOR	-0.4992 (-1.9701)	0.0522
LNGDP	0.648358 (1.1814)	0.2513	LNGDP	0.4981 (2.1367)	0.0301	LNGDP	0.3189 (1.054901)	0.2013
LNNNR	-0.14933 (-2.36833)	0.0315	LNNNR	-0.6703 (-0.8592)	0.4075	LNNNR	-0.2067 (-2.3188)	0.0326

Source: Research finding.

Note: The numbers in parentheses indicate the t statistic.

Table (3) shows the correlation coefficients between the model variables. The banking development index has the highest correlation with Institutional Quality, and the capital market development index has the highest correlation with Corruption and Institutional Quality, while the total financial system development index has the highest correlation with Institutional Quality, followed by GDP.

Model Estimation

Unit Root Test

In time series analysis, the stationarity of variables must be rigorously examined before model estimation and cointegration tests. The stability of these variables is often a prerequisite for conducting meaningful analysis due to their inherent instability over time. In this study, to account for the sensitivity of the model to the clustering of research variables, various unit root tests were employed. The first unit root test utilized in this research is the Augmented Dickey-Fuller (ADF) test. This test is widely accepted and has been used in previous studies to estimate ARDL models (Sharif et al., 2020). ARDL models commonly contend with autocorrelation in the error terms, which arises from the presence of an endogenous variable with lagged explanatory variables. To ensure the robustness of the results, the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test and the Ng-Perron unit root test were also employed. It is worth noting that the Ng-Perron unit root test is particularly advantageous when dealing with studies that have small sample sizes, as it is known to provide more reliable results. As shown in Table 4, the unit root test results indicate that some variables are stationary at level, while others become stationary after first differencing. This suggests that differencing was necessary to make certain variables stationary, which is a common practice in time series analysis to handle non-stationary data. The ARDL bounds testing approach assumes that the variables under investigation are integrated of order I(0) or I(1), or a combination of both. However, it cannot be used if any variable is integrated of order I(2). In such cases, the F-test proposed by Pesaran et al. (2001) and Narayan (2005) is not valid for assessing the presence or absence of a long-run relationship. Thus, the cointegration test must confirm that all variables are integrated of order I(0) or I(1) for the ARDL bounds testing approach to be valid (Pesaran et al., 2001).

Cointegration Analysis

ARDL Model

To explore the dynamic short-run and long-run relationships between the research variables, we opted for the Autoregressive Distributed Lags (ARDL) model. This choice is substantiated by diagnostic assessments and the inherent nature of the dataset. The ARDL model possesses distinctive features that set it apart from other time series models. One key attribute of the ARDL model is its ability to address potential endogeneity issues by incorporating lagged values of the dependent variable as explanatory variables. Furthermore, the ARDL model offers the flexibility of not requiring all variables to be integrated to the same order, as it accommodates a combination of first difference integration, level integration, or both. A notable advantage of the ARDL model is its applicability to small sample sizes, a feature of particular importance in developing countries where data scarcity is common. This versatile model is widely employed in economic studies due to its ability to simultaneously estimate long-run and short-run dynamic relationships between variables (Ali et al., 2022).

To estimate the long-term cointegration relationship between variables, a variety of econometric methods are available. In the existing literature, methods like the Engle-Granger test (1987), the Johansen test (1988, 1991), and the Pesaran et al. (2001) bounds testing approach are utilized for this purpose. The Engle and Granger cointegration test (1987) identifies cointegration between two variables of the same integration order. This makes it suitable for investigating the relationship between two variables but less effective in multivariate scenarios. To address this limitation, the Johansen (1988, 1991) cointegration test was introduced, enabling the examination of cointegration among several variables. The Johansen test, based on vector error correction modeling (VECM), was designed to overcome the shortcomings of the Engle and Granger test. However, it requires all variables to have the same integration order, which is often not the case in economic time series. Hence, to investigate cointegration among multiple variables with different integration orders of I(0) and I(1), Pesaran et al.'s cointegration test (2001) can be employed.

In this study, given the different integration orders of the variables and the aim to assess both long-term and short-term dynamic relationships among these variables, the model by Pesaran et al. (2001) is applied. The linear ARDL model is employed to investigate the relationship between financial development and natural resource rents, with the objective of testing the resource curse hypothesis in the financial market. The model is structured as follows:

$$\Delta(LnFD)_t = \alpha_0 + \alpha_1(LnFD)_{t-1} + \alpha_2 NNR_{t-1} + \alpha_3 GDP_{t-1} + \alpha_4(IQ)_{t-1} + \alpha_5(COR)_{t-1} + \sum_{i=1}^{t}\beta_i\Delta(FD)_{t-i} + \sum_{i=1}^{t}\rho_i\Delta NNR_{t-i} + \sum_{i=1}^{t}\varphi_i\Delta GDP_{t-i} + \sum_{i=1}^{t}\omega_i\Delta(IQ)_{t-i} + \sum_{i=1}^{t}\gamma_i\Delta(COR)_{t-i} + \psi_t \quad (3)$$

In this equation, Δ is the first order difference operator. α_0 and ψ are respectively the constant coefficient and the disturbance term of the model in time t. Coefficients β_i ‘ρ_i ‘φ_i ‘ω_i ‘φ_i and γ_i are short-run coefficients of the model, and α_1 .... $\alpha_{(5)}$ are the long-run coefficients of the model. The ARDL method is typically based on the F-statistic, whose asymptotic distribution is non-standard under the null hypothesis of no cointegration. In estimating the ARDL model, the first step involves estimating the equation using Ordinary Least Squares (OLS). The assessment of each equation's estimation, aimed at determining the presence or absence of a cointegration relationship between the variables, relies on the significance of the F-statistic for the coefficients of lagged variables in the model. For instance, the hypothesis test regarding the existence or absence of a long-term relationship (cointegration) is conducted based on the Wald test.

H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ Existence of cointegration (long-run relationship)

H_1: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$ Absence of cointegration (long-run relationship)

To assess the existence of a long-run relationship among the variables, the critical values proposed by Pesaran et al. (2001) are employed. These critical values include the lower critical bound (LCB) and the upper critical bound (UCB), which are used to determine the presence or absence of cointegration among the variables. If the calculated F-statistic exceeds the upper critical bound, the null hypothesis of no cointegration is rejected, indicating the existence of a significant long-run cointegration relationship among the variables. Conversely, if the F-statistic falls below the lower critical bound, the null hypothesis cannot be rejected, suggesting that no cointegration relationship exists. However, if the F-statistic lies between the lower and upper critical bounds, the result is considered inconclusive, and further investigation is required to confirm the presence of cointegration. In such cases, the significance and sign of the error correction term (ECT) in the error correction model (ECM) can provide additional evidence regarding the existence of a long-run equilibrium relationship.

However, it should be noted that the critical values provided by Pesaran et al., (2001) are more suitable for larger samples (T=500 to T=40000). Given the relatively small sample size in this study, using the critical values from Narayan (2005) is considered more appropriate. The critical values proposed by Pesaran et al. may yield biased results in small samples when identifying cointegration relationship, whereas those presented by Narayan have demonstrated better performance for sample sizes ranging between 30 and 80 (Narayan, 2005). Subsequently, the short-run and long-run coefficients are estimated, and diagnostic tests are conducted to ensure the model's validity. Equation (4) is provided to estimate the model's short-run coefficients, and γ_i representing the speed of adjustment for the long-term equilibrium of the model due to short-term shocks or error correction.

$$\Delta(\mathrm{FD})_{\mathrm{t}} = \gamma_0 + \sum_{i=1}^{t} \beta_i \Delta(FD)_{t-i} + \sum_{i=1}^{t} \rho_i \Delta NNR_{t-i} + \sum_{i=1}^{t} \varphi_i \Delta GDP_{t-i} + \sum_{i=1}^{t} \omega_i \Delta(IQ)_{t-i} + \sum_{i=1}^{t} \gamma_i \Delta(COR)_{t-i} + \gamma_i \mathrm{ECM}_{\mathrm{t-1}} + \vartheta_{\mathrm{t}} \qquad (4)$$

Accurate model diagnosis is a fundamental step in interpreting the results of any estimation model. In this study, a comprehensive set of diagnostic tests was conducted to ensure the validity of the research findings. The results of these diagnostic tests are presented in Table (5).

NARDL Model

The ARDL model is applied to estimate both short-run and long-run linear relationships between the variables. However, it does not adequately capture non-linear or asymmetric relationships between the model variables. To address this limitation, this study explores the potential for non-linear and asymmetric relationships between resources rents and financial development using the ARDL non-linear model developed by Shin et al. (2014). This model, known as the Non-linear Autoregressive Distributed Lag (NARDL) model, is a specialized variant of the ARDL model proposed by Pesaran et al. (2001). The NARDL model offers the advantage of examining asymmetry in both the short-run and long-run relationships between variables. Notably, it demonstrates higher efficiency in models with limited observations and is suitable for cases where the explanatory variables are endogenous. The non-linear form of the primary research model, based on the basic research equation, is as follows:

$$LnFD_t = \beta_0 + \beta_1 NNR_t^+ + \beta_2 NNR_t^- + \beta_3 GDP_t + \beta_4 IQ_t + \beta_5 COR_t + \varepsilon_t \qquad (5)$$

In the equation of NNR_t^+ And NNR_t^- , the positive and negative impulses of resources rents are used in order to investigate their asymmetric effect on various indicators of financial development based on the definition of Granger and Yoon (2002). To The form of cumulative positive (positive components) and negative (negative components) are defined and calculated as follows:

The equation of NNR_t^+ and NNR_t^- represent the positive and negative impulses of resources rents, respectively. These are utilized to assess their asymmetric impact on various financial development indicators, following the framework established by Granger and Yoon (2002). The cumulative positive (positive components) and negative (negative components) forms are defined and calculated as follows:

$$NNR_t^+ = \sum_{1990}^{2021} \Delta NNR_t^+ = \text{Max}\ (\Delta NNR, 0) \quad (6)$$

$$NNR_t^- = \sum_{1990}^{2021} \Delta NNR_t^- = \text{Min}\ (\Delta NNR, 0) \quad (7)$$

By incorporating both positive and negative values into equation (5), the nonlinear ARDL model, designed to explore the nonlinear relationship between financial development and natural resources rents, is as follows:

$$\Delta(LnFD)_t = \alpha_0 + \alpha_1(LnFD)_{t-1} + \alpha_2^+ NNR_{t-1}^+ + \alpha_3^- NNR_{t-1}^- + \alpha_4 GDP_{t-1} + \alpha_5(IQ)_{t-1} + \alpha_6(COR)_{t-1} + \sum_{i=1}^{t} \beta_i \Delta(FD)_{t-i} + \sum_{i=1}^{t}(\rho_i^+ NNR_{t-i}^+ + \rho_i^- NNR_{t-i}^-) + \sum_{i=1}^{t} \varphi_i \Delta GDP_{t-i} + \sum_{i=1}^{t} \omega_i \Delta(IQ)_{t-i} + \sum_{i=1}^{t} \gamma_i \Delta(COR)_{t-i} + \psi_t \quad (8)$$

In equation (8), $\sum_{i=1}^{t} \rho_i^+$ And $\sum_{i=1}^{t} \rho_i^-$ denote the cumulative positive and negative effects of natural resources rent on various financial development indicators in model. α_2^+ and α_3^- also represent positive and negative effects in the long-run. The error correction form of equation (8) is as follows:

$$\Delta(\text{FD})_t = \gamma_0 + \sum_{i=1}^{t} \beta_i \Delta(FD)_{t-i} + \sum_{i=1}^{t}(\rho_i^+ NNR_{t-i}^+ + \rho_i^- NNR_{t-i}^-) + \sum_{i=1}^{t} \varphi_i \Delta GDP_{t-i} + \sum_{i=1}^{t} \omega_i \Delta(IQ)_{t-i} + \sum_{i=1}^{t} \gamma_i \Delta(COR)_{t-i} + \gamma_i \text{ECM}_{t-1} + \vartheta_t \quad (9)$$

In equation (9), γ_i is error correction term and it shows the speed of long-run adjustment of the nonlinear model after the short-run shock. ρ_i^+ And ρ_i^- denote asymmetric short-run adjustment and other variable coefficients indicate the short-run effects of each explanatory variable. Like the ARDL model and according to Pesaran et al. (2001), the F statistic is used to check the existence of a long-run relationship and the standard Wald test is also used to check the presence or absence of long-run and short-run symmetries.

Optimal Lag Selection, Cointegration Teste results, and other Diagnostic Statistics

According to Sims (1980), selecting the appropriate variables for inclusion in autoregressive system models and determining the optimal number of lags are extremely important. In these models, which often involve a substantial number of parameters, it is important to employ a principle of parsimony to determine the optimal lag length. Information criteria serve as invaluable tools for this purpose in such system models. Given the limited time frame of this study and the superior performance of the Schwarz Bayesian Information Criterion (SBIC) in small sample sizes compared to other criteria, the SBIC was utilized to select the optimal lag order. The maximum lag order for the variables in this research was determined using the SBIC, and the optimal lag length for each variable was based on the Schwarz criterion (Aghaei, 2016).

After conducting stationarity tests for the variables and ensuring that they do not exhibit integration beyond the second order, the study proceeds to assess the long-run relationships between the variables and conduct additional diagnostic tests to confirm the models' stability. The first column of Table (5) presents the estimated relationships between the model variables across three models, corresponding to three financial development indicators. The second column displays the optimal lag lengths for each variable, determined using the Schwarz Bayesian Criterion (SBIC). The third column presents the F-statistic values from the Pesaran bounds test, which investigates the presence or absence of long-run relationships between the variables. The table reveals that, based on Pesaran's test, there is a confirmed long-run relationship between the variables in all research models at a 95% confidence level. Additionally, an alternative and efficient method for testing the existence of a long-run relationship is the significance of the error correction coefficient (ECM). The consistently negative and significant values of this coefficient across all estimation models validate the presence of long-run relationships. The remaining columns of the table present diagnostic statistics for the models, which serve to verify the classical assumptions and the validity of the estimated models. These tests further corroborate the results obtained from both the ARDL and NARDL models, thus ensuring the reliability of the interpretations and conclusions.

Short-run and Long-Run Estimation and interpretation of results

After performing the necessary diagnostic tests, this section presents the long-run and short-run relationship between the research variables using the ARDL method in Table (6).

After conducting the diagnostic tests for the models and confirming the results, the findings are examined and analyzed. According to the results, the development of the banking sector, the stock market, and the overall financial system in the previous period has a positive and significant effect on their development in the current period. Therefore, it can be concluded that any action aimed at improving the development of the financial system is essential for its further progress. These results align with economic theories and findings from previous studies, including Ali et al. (2022) and Dwumfour and Gyamfi (2018).

Based on the results presented in Table (6), resource rents have had a negative and significant impact on the development of the banking sector in Iraq in the short run, indicating that income from natural resources has not been able to foster banking sector development in this country. In the long run, the impact of income from natural resources on the development of the banking sector in Iraq is also negative and significant. Given the significant and negative impact of rent-seeking on the development of the banking sector, the hypothesis of the financial resources curse in the banking sector of this country is confirmed. The effect of natural resource abundance on stock market development is positive in the short run and negative in the long run, but neither coefficient is statistically significant. Therefore, according to this result, it is not possible to make a judgment on either rejecting or confirming the hypothesis of financial resources curse in the stock market in Iraq. However, given the negative and significant impact of natural resource abundance on the overall financial development index in Iraq, the hypothesis of a financial resource curse in this country can be confirmed.

The excessive reliance of Iraq on oil revenues, which leads to reduced production and economic diversity, the limited emphasis on banking and financial development due to the primary focus on income from natural resources, mismanagement of natural resources leading to inefficient allocation, and the prolonged security issues can be regarded as contributing factors to the financial resources curse in this country.

Considering the economic conditions in Iraq and the model estimation results, the enhancement of the quality of existing institutions and structures in the country can be identified as a significant factor influencing the development of the banking sector and stock market. Over the long run, this variable has exhibited a positive and substantial impact on the development of the banking sector, stock market, and financial system in Iraq. This finding aligns with the research of Ali et al. (2022) and Aghaei et al. (2023). Iraq's existing structures provide a foundation for transforming the financial resource curse into a blessing in the stock market and banking sector. By improving institutional quality — especially institutions related to the financial system — revenues from natural resources can be optimally utilized to fund the private sector. High-quality institutions foster economic growth, financial innovation, and reduced credit allocation costs. In essence, income from natural resources increases liquidity in the economy and financial markets. This increase in liquidity, together with high institutional quality, can effectively be transformed into financial development only when the institutional quality of the economy is sufficiently strong.

The results suggest that economic growth has not had a significant impact on banking sector development in Iraq, either in the short run or the long run. Despite a positive long-run effect, it is not statistically significant. In the short run, economic growth had a positive but insignificant impact on stock market development. However, in the long run, it exhibited a positive and significant influence on stock market development.

Higher economic growth typically corresponds to greater investment opportunities and economic stability. This, in turn, enhances the willingness of the private sector to invest in financial markets, thereby contributing to stock market development. The impact of economic growth on overall financial development is also positive, but it lacks statistical significance. This suggests that the benefits of economic growth did not significantly get into financial development in Iraq during the period under examination. This result can be attributed to the fact that Iraq's economic growth was primarily reliant on the sale of natural resources (oil), with the private sector playing a limited role in production. Therefore, this outcome appears reasonable.

The results indicate that the impact of corruption on banking sector development, in the short run is not statistically significant, However, when examining the long-run model estimation results, the corruption index has a positive impact on banking sector development in Iraq. This suggests that the Grease the Wheels Hypothesis is confirmed, indicating that corruption can play a facilitating role in the functioning of the banking sector in this country. In less developed countries with inefficient financial institutions, corruption might smooth the functioning of banks and promote unhealthy banking activities. In contrast, the impact of the corruption index on stock market and financial system development is negative and significant, both in the short run and the long run. This implies that, unlike in the banking sector, increased corruption acts as an obstacle to the development of the stock market and the overall financial system.

Stability Test

Examining the stability of the estimated parameters in ARDL estimation is very crucial to ensure the obtained results. To assess the stability of the estimated parameters, two tests were performed: the Cumulative Sum of Residuals (CUSUM) and the Cumulative Sum of Squared Residuals (CUSUMSQ) tests on the regression residuals. The results of these tests indicate no evidence of parameter instability in the estimated models. Therefore, the estimated parameters are stable, providing confidence in making policy recommendations based on these findings.

Figure 1. CUSUM and CUSUMSQ Graphs for First Model Estimation: Banking Development Index

Source: Research finding.

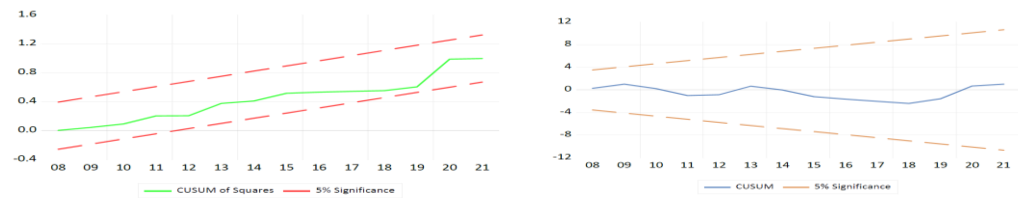

Figure 2. CUSUM and CUSUMSQ Graphs for Second Model Estimation: Stock Market Development Index

Source: Research finding.

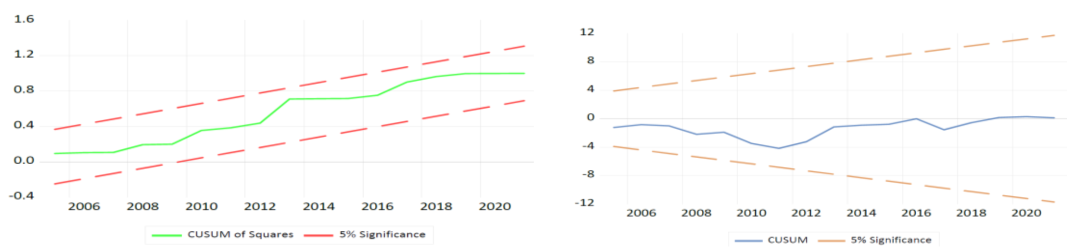

Figure 3. CUSUM and CUSUMSQ Graphs for Third Model Estimation: Total Financial Development Index

Source: Research finding.

NARDL Estimation

The results of estimating the model under the assumption of a linear relationship between the variables are presented in Table (6). In the next phase of the research, considering the potential asymmetric impact of resource rents on various indicators of financial development, the research models are re-estimated. To explore this asymmetric effect, the resources rents variable will be split into two series, denoted as NNR_t^+ and NNR_t^- derived from the accumulation of positive and negative changes in resources rents calculated through a conditional process. The results of this decomposition is shown in Figure (4).

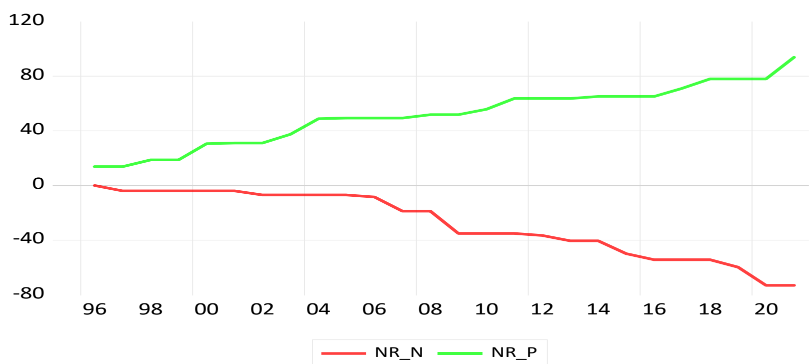

Figure 4. Decomposition of Resources Rents

Source: Research finding.

Similar to the estimation of the symmetric ARDL model, the Schwarz–Bayesian criterion is also employed in the asymmetric ARDL model to determine the optimal lag. Additional diagnostic tests were conducted both before and after estimation, and the optimal lag lengths for the variables are presented in Table (4). The results of these diagnostic tests demonstrate that all calculated statistics are statistically significant at a confidence level exceeding 95%. The probability values and Pesaran's F-test statistic also confirm the existence of a long-run relationship between the variables. Furthermore, the estimated coefficients of the error correction term are negative and statistically significant in all three models. Given that the absolute value of this coefficient is less than one, this provides further evidence of the existence of a long-run relationship in the estimated models.

After confirming the long-run relationship between the variables, the short-run relationship is estimated in the NARDL model using the Unrestricted Error Correction Model (UECM). The UECM approach employs the bounds test but does not constrain the short-run relationship, incorporating both short-run and long-run information through the error correction component and the lagged values of the differenced variables. This approach differs from the traditional ECM method, which focuses solely on the long-run relationship. The results of the model estimation in both the short run and the long run are presented in Table (7).

Table 7. NARDL Model Estimation

Short-term estimation								
Dependent variable: Banking Development IndexFDB			Stock Market Development Index :Dependent variable FDS			Total Financial :Dependent variable Development IndexTFD		
Variables	**coefficient**	**probability**	**Variable**	**coefficient**	**probability**	**Variable**	**coefficient**	**probabilit**
LNFDB (-1)	0.59365 (5.2569)	0.0001	LNFDS (-1)	0.193753 (5.7765)	0.0001	LNTFD (-1)	0.1387 (1.90891)	0.0571
IQ	-0.592319 (-0.83421)	0.5884	IQ	0.06578 (0.46013)	0.7421	IQ	0.02590 (2.3125)	0.0396
LNCOR	-0.26459 (-2.3724)	0.0390	LNCOR	0.3086 (0.3062)	0.8154	LNCOR	-0.1690 (1.8300	0.0855
LNCOR (-1)	0.089662 (1.19085)	0.2539	LNCOR (-1)	-1.6991 (-2.4787)	0.0249	-	-	-
LNGDP	0.68919 (3.7592)	0.0018	LNGDP	1.1001 (0.62121)	0.5594	LNGDP	0.027910 (0.69852)	0.4984
LNGDP (-1)	0.72091 (2.55521)	0.0257	-	-	-	-	-	-
+ LNNNR	-0.9346 (-2.56472)	0.0256	+ LNNNR	-0.4941 (-1.05628)	0.3098	+ LNNNR	-0.193410 -3.9202	0.0010
- LNNNR	-0.34321 (-5.13133)	0.0002	- LNNNR	-01.7080 (-0.35894)	0.7320	- LNNNR	-0.07593 (-1.1549)	0.2677
+ LNNNR (-1)	-0.24443 (5.29498)	0.0001	-	-	-	-	-	-
- LNNNR (-1)	-0.02258 (-0.00518)	0.9266	-	-	-	-	-	-
c	0.0700 (0.4906)	0.6545	c	0.5577 (0.5934)	0.5825	c	0.1862 (0.271)	0.8153
Error Correction Term (ECT)	-0.343361 (-4,9987)	0.0006	Error Correction Term (ECT)	-0.40971 (-4.5794)	0.0008	Error Correction Term (ECT)	-0.6570 (5,6814)	0.0001
long-run estimation								
Variables	**coefficient**	**probability**	**Variables**	**coefficient**	**probability**	**Variables**	**coefficient**	**probabilit**
c	.82423 (4.6047)	0.0383	c	0.028521 (0.1605)	0.8839	c	0.028621 (0.17085)	0.8841
IQ	0.39674 (3.4864)	0.0435	IQ	-0.55247 (3.2240)	0.0126	IQ	0.32638 (2.4540)	0.0333

LNCOR	-0.2870 (-2.4658)	0.0334	LNCOR	-0.3408 (-2.7287)	0.0186	LNCOR	-0.4002 (-1.969)	0.0511
LNGDP	0.65958 (2.0454)	0.0412	LNGDP	0.2091 (2.1563)	0.0312	LNGDP	0.3299 (3.5501)	0.0473
+LNNNR	-0.10884 (-5.344)	0.0001	+LNNNR	-0.8838 (-1.09689)	0.2896	+LNNNR	-0.18520 (-3.9688)	0.0008
-LNNNR	-0.022766 (-0.08664)	0.9535	-LNNNR	-0.32409 (-0.3828)	0.7332	-LNNNR	-0.07730 (-1.4412)	0.2145
Short-Run Symmetry Test	2.4325	(0.012)	Short-Run Symmetry Test	2.1432	(0.001)	Short-Run Symmetry Test	1.82344	(0.001)
Long-Run Symmetry Test	9.9865	(0.001)	Long-Run Symmetry Test	10.8765	(0.013)	Long-Run Symmetry Test	11.6793	(0.006)

Source: Research finding.

According to the results presented in Table (7), the estimated coefficients of resource rents in the banking development index model for the short run indicate that both positive and negative shocks originating from resource rents have a significant negative impact on the banking development index. However, the coefficients related to the lags of negative shocks also have a negative effect, but they are not statistically significant. The long-run estimation results validate the short-run findings, showing a negative and significant impact of positive resource rents shocks on banking development, while negative shocks exhibit a negative effect but are not statistically significant. The results of the nonlinear model estimation confirm the hypothesis of a financial resource curse in the banking sector. Moreover, considering the significant negative impact of positive resource rents shocks on the banking development index, the NARDL model results support the findings obtained from the ARDL model, confirming the hypothesis of a natural resource curse in the banking sector.

Regarding the stock market development model, it is observed that both positive and negative resource rents shocks have a negative impact on the development of the stock market in both the short run and the long run. However, none of the obtained coefficients are statistically significant, making it challenging to draw definitive conclusions.

The results of the model estimation for the total index of financial development demonstrate that positive resource rents shocks have a significant negative impact on the development of the financial system, both in the short run and in the long run. Conversely, negative shocks have a negative impact but are not statistically significant. Thus, these results, along with the asymmetric impact of positive and negative resource rents shocks, confirm the hypothesis of a financial resource curse in the financial system. Considering the significant negative impact of positive resource rents shocks on the total index of financial development, these results align with the findings from the ARDL linear model.

The error correction coefficient in all three models serves to reconfirm the existence of a long-run relationship between the variables. Additionally, it indicates the speed at which the variables adjust toward the long-run equilibrium when they are out of balance in each period. Specifically, in the models for banking development, stock market development, and the development of the entire financial system, this adjustment speed is approximately 34%, 40%, and 65%, respectively.

Robustness Check

In addition to the ARDL and NARDL model estimations, this research also employed the Dynamic Ordinary Least Squares (DOLS) estimation method to establish long-run relationships between the variables in each model. The DOLS method offers several advantages. First, it is a straightforward approach that provides consistent, unbiased, and efficient parameter estimates. Second, it addresses issues such as sample bias, contemporaneous bias, autocorrelation, and non-normality of data, which are common in financial time series. Third, DOLS transforms the dependent variable and corrects the bias of the estimated coefficients when there is an adjusted dependent variable (Arize et al., 2015). To confirm the existence of a long-run relationship, Hansen's cointegration test was employed, and cointegration was confirmed in all the models. Additionally, the significance of all model coefficients was confirmed through the Wald test. The results of the DOLS estimation aligned with the findings of the previously estimated models, providing further support for the research's outcomes.

Table 8. DOLS Estimation

long-run estimation								
Variables	**coefficient**	**probability**	**Variables**	**coefficient**	**probability**	**Variables**	**coefficient**	**probability**
c	(0.7123) (4.463)	0.0372	c	0.026521 (0.1485)	0.8619	c	0.025321 (0.14907)	0.7729
IQ	0.46574 (3.5704)	0.0443	IQ	0.53938 (3.240)	0.0119	IQ	0.32638 (2.3440)	0.0333
LNCOR	-0.2870 (-2,3667)	0.0334	LNCOR	-0.3588 (-2.6276)	0.0189	LNCOR	-0.4981 (-1.9892)	0.0533
LNGDP	0.66728 (1.0245)	0.2997	LNGDP	0.4872 (1.1967)	0.2697	LNGDP	0.3189 (1.0671)	0.2987
LNNNR	-0.14822 (-2.453)	0.0326	LNNNR	-0.6892 (-0.8681)	0.4186	LNNNR	-0.2956 (-2.228)	0.0301
Hansen Cointegration Test	3.436	0.3456	Hansen Cointegration Test	2.5678	0.2346	Hansen Cointegration Test	4.7890	0.5781
R^2	0.96		R^2	0.95		R^2	0.95	
Wald Test	4.7898	0.0000	Wald Test	6.9543	0.0000	Wald Test	8.84680	0.0000

Source: Research finding.

Conclusion and Policy Implications

This study examines the hypothesis of the financial resource curse by considering three different indicators: banking development, stock market development, and overall financial system development. The analysis covers the period from 1990 to 2021, using annual data for various variables. All data used in this research were collected from the World Bank, and the indicators for banking development, stock market development, and institutional quality were constructed by combining various indicators using the Principal Component Analysis (PCA) methodology.

Initially, the relationship between the variables was estimated using the Autoregressive Distributed Lag (ARDL) model. Subsequently, to investigate the potential nonlinear relationship between resource rents and different financial development indicators, the Nonlinear Autoregressive Distributed Lag (NARDL) model was employed. The results of this model, along with symmetry tests, confirmed the asymmetric effect of resource rents on financial development indicators. To ensure the robustness of the research results, the Dynamic Ordinary Least Squares (DOLS) estimation method was also employed. This comprehensive approach helped validate the findings regarding the financial resource curse.

The empirical results obtained from the estimation of the research models support the hypothesis of a financial resource curse in the banking sector and the overall financial system in Iraq. This is primarily due to the negative and significant impact of natural resource rents on the development index of the banking sector and overall financial development over the period under examination. The NARDL model further reinforces this conclusion, as it highlights the negative and significant impact of positive resource rents shocks and the negative (though statistically insignificant) impact of negative shocks on the development index of the banking sector and overall financial development, both in the short run and the long run. This reconfirms the existence of a natural resource curse in the banking sector and financial system, in alignment with the results obtained from the ARDL model. However, it is important to note that the results do not provide sufficient evidence to comment on the existence of a financial resource curse hypothesis in Iraq's stock market. The coefficients of the resource rents variable in estimating the stock market development index are not statistically significant, making it difficult to draw a definitive conclusion regarding this sector.

Based on the results, it appears that economic growth has had a positive but statistically insignificant effect on banking development, stock market development, and the overall financial system in Iraq during the period under examination. This suggests that economic growth has not significantly contributed to the development of the financial system in the country. In contrast, institutional quality has demonstrated a positive and significant impact on all of these sectors, indicating that strong institutions play a crucial role in fostering the development of the banking sector, stock market, and financial system in Iraq. Furthermore, the corruption index has exhibited varying impacts. It has a negative and significant effect on financial development in the stock market and the overall financial system. However, its impact on the development of the banking sector is positive but not statistically significant. These results imply that corruption acts as a hindrance to financial development, particularly in Iraq's stock market.

Based on the findings, it is imperative for the government to pay special attention to the stock market, recognized as one of the most efficient components of the financial system, for the effective management of income derived from natural resources. To this end, it is advisable to channel revenue from natural resources into productive sectors, thereby fostering opportunities for growth and development. In addition, there are other policy recommendations to consider. These include diversifying financial services and products, optimizing resource income through effective investments, enhancing the quality and efficiency of financial institutions and markets, refining existing financial services and products, elevating institutional standards, focusing on human capital development, promoting financial literacy related to services and products, and increasing both transparency and accountability within the financial system. These measures will encourage investor support and foster healthy competition.

In light of the noteworthy and positive influence of the institutional quality variable on various financial development indicators, it becomes evident that natural resource revenues exert a positive impact on stock market development only when high-quality institutions exist within a country's economy. Hence, the enhancement of institutional quality stands as a vital prerequisite for advancing stock market development, necessitating that policymakers in such nations institute appropriate measures to improve governance. Addressing structural issues and elevating the quality and efficiency of existing institutions should take precedence in national macroeconomic policy. Essentially, governments should strive to establish institutions that combat corruption, ensure the rule of law, enhance transparency and efficiency in laws and regulations, support investment, promote political stability, and foster greater accountability of government officials to the populace. Simultaneously, enacting prudent laws, bolstering supervision of financial markets (especially the stock market), and easing or removing superfluous regulations related to production and financial liberalization in these countries are essential steps. This will elevate investor confidence, attract foreign direct investment, and optimize resource allocation to spur stock market growth, ultimately contributing to economic stability. Furthermore, considering the detrimental and significant impact of corruption on financial development, particularly within Iraq's banking system, imposing substantial fines and stringent regulations will incentivize banks to adhere to the rules. The imposition of heavy fines can act as a deterrent to capital market participants and banks that fail to fulfill their obligations under the regulatory framework. Promoting transparency in performance disclosure can further discourage non-compliance with the law by affecting an institution's credibility.

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