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How natural resources shape the industrial development: Evidence from N-10 countries

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Abstract: This study analyzes the effect of natural resources on the manufacturing industry. It aims to fill the gap in the research on the impact of natural resources on industrial productivity since there is very limited literature on such a topic, particularly in the Next Eleven countries (N-11), excluding South Korea (referred to as the N-10 countries). South Korea is not included as a sample because it does not have many natural resources. The N-10 countries (Vietnam, Turkey, Philippines, Pakistan, Nigeria, Mexico, Iran, Indonesia, Egypt, and Bangladesh) have a large population, rapid economic growth, and political and economic stability. The Generalized Method of Moments (GMM) is implemented using data panels of the N-10 countries with natural resources from 2015 to 2021. This study confirms that the resource curse exists, as evidenced by the detrimental effects of abundant natural resources on industrial productivity. Empirical findings have also documented a significantly adverse impact of corruption practices in the manufacturing sector. Meanwhile, capital and trade openness should be further improved to encourage value-added industries. Based on the results of this study, the N-10 countries are recommended to diversify their economies, reduce reliance on natural resources, and strengthen the control of corruption.

Keywords: Industrialization; Natural Resource Curse; Economic Growth
JEL Classification: O14; Q56; O4

Introduction

Havranek et al. (2016) stated that the literature in economics may contain different reviews and mixed empirical evidence regarding the relationship between natural resources and economic growth. On the one hand, the abundance of natural resources is regarded as a blessing for a country in improving its economy (Brunnschweiler & Bulte, 2008; Cavalcanti et al., 2011). On the other hand, countries that are rich in natural resources may be "cursed" as impoverished (Badeeb et al., 2017; Gylfason, 2002).

These different viewpoints began in the early 1980s when several economists criticized the effects of abundant natural resources on a country's economic growth. Auty (1994) popularized a hypothesis on the "curse of natural resources" by describing the phenomenon of nations with abundant natural resources experiencing decreased growth, particularly those in the Middle East, Africa, and Latin America.

In contrast, nations with fewer natural resources have experienced better economic growth.

Subsequently, studies by Sachs and Warner (1995) empirically demonstrated a negative correlation between natural resources and economic growth of a country and they were the first group to prove the existence of such a natural resource curse. It sparked more studies examining the transmission of the adverse relationship between economic growth and reliance on natural resources to demonstrate that the natural resource curse conundrum does exist. For example, in Indonesia, regions with more prosperous mining wealth than others have faced worse curses (Rahma et al., 2021).

According to (Badeeb et al., 2017), the failure of various countries to gain benefits from managing abundant natural resources is influenced by political and economic factors. From a political perspective, the natural resource curse can be explained by two factors. First, the rent-seeking carried out by political elites that gain group benefits has widened economic disparities (Iimi, 2007; Sala-i-Martin & Subramanian, 2013). Second, weak institutions lead to corruption and bureaucratic inefficiency as commodity revenues soar (Arezki & Brückner, 2011; (Eregha & Mesagan, 2016). According to (Kuncoro, 2006), most rent-seeking comes from bribes and regulatory administrative requirements by the government, including licensing. The rent-seeking actors would lobby the policymakers to accommodate their specific interests.

Meanwhile, the first economic factor affecting the natural resource curse is the volatility of commodity prices, which constrains economic development plans and impacts macroeconomic instability (Davis & Tilton, 2005; van der Ploeg & Poelhekke, 2009). The second economic factor is that a surge in national commodity income triggers economic mismanagement in the government (fiscal/budget) and society (education and human resources).

The third economic factor that influences the natural resource curse includes dependence on the exports of natural resources, which causes a decline in national economic growth through the crowding out effect in the manufacturing sector, known as the "Dutch Disease" (Corden & Neary, 1982; Gylfason, 2002; Sachs & Warner, 1995). (Badeeb et al., 2017) explained that the Dutch Disease syndrome produces two impacts, namely the spending effect and the movement effect. The spending effect is the income effect from natural resources which drives domestic demand, thereby increasing inflation and exchange rate appreciation. Furthermore, the price of domestic goods becomes more expensive than that of imported goods, making the manufacturing sector less competitive. The movement effect can be explained as an effect where business activity in natural resource increases, and it then causes a shift of labor and capital from the non-natural resource sector (such as manufacturing) to the booming natural resource sector. As a result, the resource sector experiences growth, but the non-resource sector (such as manufacturing) experiences a decline in productivity. According to (Alssadek & Benhin, 2021), the Dutch Disease refers to a phenomenon in which an increase in natural resource leads to exchange rate appreciation, suppresses the manufacturing sector, and adversely affects the economy. (Iimi, 2007) suggests that the Dutch Disease is an early economic symptom that is popular for detecting a natural resource curse in a country.

According to (Bahar & Santos, 2018), increasing natural resources in a country can negatively impact its industrial structure because it increases the value of the local currency which makes the manufacturing sector less competitive. Therefore, these changes hinder economic diversification and industrial growth, indicating that comprehensive natural resource management is needed to support a strong industrial structure (Stiglitz, 2017).

According to (Xu et al., 2019), abundant natural resources do not guarantee support for increased growth because there is a missing function that serves as a conduit to encourage growth. (Badeeb et al., 2017) argued that studying the natural resource curse by merely showing the connection between economic growth and natural resources is insufficient; some mechanisms link natural resource dependence with poor economic performance. In this regard, a strong manufacturing industry is needed so that natural resources can become a valuable source of growth.

Improving manufacturing performance is necessary for sustainable economic growth by absorbing many workers in jobs with decent wages, thereby increasing workers' living standards (Signé, 2018). (Mesagan & Bello, 2018) stated that economic growth and job creation are the outcomes from expanding the manufacturing sector. Therefore, (Shimada, 2016) argued that industrial development provides essential channels for structurally transforming an economy from an agricultural foundation to a modern one. In this case, to avoid the Dutch Disease that can lead to the natural resources curse, it is necessary to put effort into developing the country's industry.

Furthermore, the development of the manufacturing sector should not be overlooked in the relationship between natural resources and economic growth, where output growth and manufacturing productivity are inextricably linked (Mesagan et al., 2023). Their research findings show that natural resource abundance may weaken industrial development and economic growth in the long term. Furthermore, using samples from 27 countries in sub-Saharan Africa from 2000 to 2016, (Nkemgha et al., 2022) showed a negative relationship between the total rent of natural resources and industrialization. This means that reliance on natural resources may hinder economic expansion. (Wang et al., 2022) argued that natural resource-rich nations should optimize their industrial systems and diversify their economies.

Therefore, manufacturing value added is a key indicator of a nation's industrial capacity and economic diversification. It reflects the net output of the manufacturing sector after deducting input costs such as raw materials, energy, and labor. The higher the percentage, the more substantial contribution of manufacturing to the overall economic output. Nations with higher manufacturing added value typically enjoy more stable and sustained economic growth, as manufacturing activities produce more significant value than relying on raw resource extraction (Muhammad et al., 2024).

Although the body of this research on natural resources focuses on economic growth, there is limited understanding of their impact on industrialization, especially in the Next Eleven countries (N-11). Goldman Sachs researchers developed the idea of the N-11 countries, describing them as an alliance of rapidly growing economies with significant investment potential (O'Neill et al., 2005). Vietnam, Turkey, Philippines, Pakistan, Nigeria, Mexico, South Korea, Iran, Indonesia, Egypt and Bangladesh are among the nations listed in the N-11 list.

South Korea is excluded from the sample in this study due to its lack of natural resources and its dependence on technology and human capital as the primary drivers of its economic growth. The remaining ten N-11 countries possess substantial natural resource reserves and are in various stages of industrial development, making them relevant to this study. Hence, hereinafter, these ten countries are referred to as the N-10.

Focusing on the N-11 nations is important for a number of reasons. The N-11 nations have rapid population growth rates and are anticipated to become a major proportion of the world's population by 2050. The economic stability, flow of investment, stable political environment, and growing trade openness have positioned these nations as the world’s next major markets, and they are expected to hold a substantial share in global production and consumption (Erdoğan et al., 2020). However, these N-11 nations are experiencing a natural resource curse where investment in technological innovation and human capital is needed to help overcome the problem of the curse and turn it into a resource blessing (Li et al., 2020). Moreover, (Rahim et al., 2021) supported the hypothesis of natural resource curse, observing that larger natural resource rents tend to hinder the economic growth of the N-11 nations. They emphasized the importance of prioritizing human capital development to turn the challenges of natural resources into opportunities for these countries.

Based on the World Development Indicator (WDI) data from the World Bank, Figure 1 shows the added value of manufacturing (MVA) from the N-10 countries between 2015 and 2021. Except for Vietnam, the processing industry is, on average, below 20 percent. This shows that the added value of manufacturing is still low and has not been able to drive growth and prosperity due to the lack of diversification and substantial dependence on raw materials from natural resources. (Erumban et al., 2019) argued that economic growth entails transformations in industrial structures, which are central to economic progress.

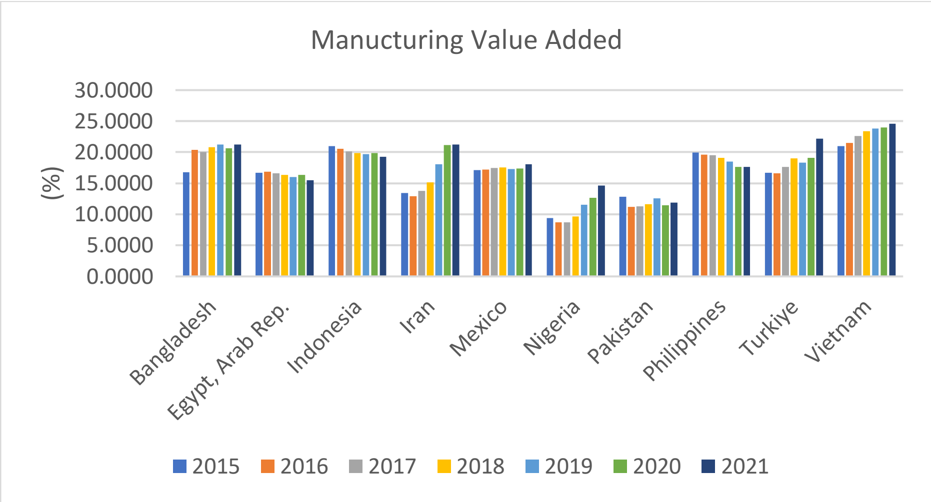

Figure 1 Manufacturing Value Added (MVA) in the N-10 Countries

In addition to MVA, control of corruption is defined as the abuse of public power for personal gain, including various forms of corruption, such as bribery and misuse of public funds. As released by the Worldwide Governance Indicator (WGI) from the World Bank, this control of corruption indicator ranges from -2.5 to +2.5, where a negative value indicates a high level of corruption or weak control of corruption. In contrast, a positive value indicates the opposite value, namely a better level of corruption control and fewer incidents of corruption. Countries with high values in controlling corruption have strong institutions, effective transparency, and law enforcement systems in place. Meanwhile, countries with negative values usually face serious challenges, such as weak institutions and a lack of accountability.

Figure 2 shows the levels of corruption control that are very weak in the N-10 countries. Iran and Nigeria have the worst corruption control, scoring below -1. Many countries rich in natural resources are experiencing slow economic growth due to corruption which hinders efficient and just management of natural resources. Controlling corruption in the natural resource sector is one of the keys to achieving economic growth, preserving the environment, and ensuring that income from natural resources can be equally distributed. The quality of the institutions, including corruption control, can trigger either the natural resource curses or turn natural resource as blessings (Mehlum et al., 2006).

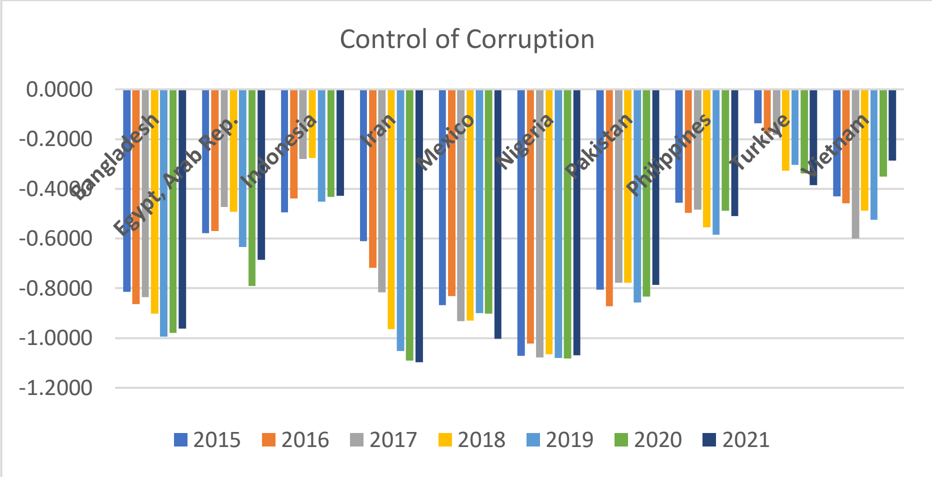

Figure 2 Control of Corruption (CC) in the N-10 Countries

This paper aims to analyze the relationship between natural resources and industrial productivity. This paper also seeks to address the identified gap by examining the impact of natural resources on the development of industrialization in the N-10 countries from 2015 to 2021. In other words, this research fills the gap in the literature as there is very limited research on the effect of natural resources on manufacturing productivity in the N-10 nations. The low level of industrialization in the ten countries may be attributed to their lack of ability to utilize their natural resources. This research intends to support these countries in exporting natural resources and encouraging export diversification. It also aims to help these countries to reduce macroeconomic volatility associated with the changes in commodity prices and to support sustainable economic development.

Research Method

The theoretical basis of this research refers to the Dutch Disease and natural resources curse. This research investigates the effect of natural resources on manufacturing value added (MVA) in the N-10 countries. The economic model in this research is based on (Hidalgo & Hausmann, 2009), (Tabash et al., 2022), and (Mesagan et al., 2023). This model explains the correlation between natural resources and the growth in economy. Theories of endogenous growth and comparative advantage underlie the model. In this case, location and natural resource differences are essential for a country to trade by taking advantage of these relative advantages. Meanwhile, human resources, innovation, and knowledge are factors driving growth.

Based on Solow's theory, economic growth is influenced by labor and capital, whereas the Solow neoclassical growth model additionally involves knowledge. (Mesagan et al., 2023) also stated in their research that industrial productivity and output growth are inseparable. Institutions can have a positive influence on the economy. Poor institutions in most resource-rich countries have led to rent-seeking and corruption practices (Nzeh Innocent et al., 2021). According to (Dietz et al., 2007), measuring the level of corruption is one way to measure institutional performance. Furthermore, (Henri, 2019) found that one of the primary aspects of institutional quality that is severely harmed by reliance on natural resources is corruption. In the model, the institution is represented by the control of corruption based on the World Governance Indicator (WGI) data from the World Bank. In addition, trade openness and foreign direct investment can influence the economy's growth.

This study uses a regression approach to the equation by referring to the research conducted by (Tabash et al., 2022) and (Mesagan et al., 2023). The study incorporates a lagged dependent variable and investigates how natural resources might improve industrial performance. Manufacturing value added (MVA) is the dependent variable, natural resource rent (RER) is the main independent variable, and control of corruption (CC), labor force growth (L), the formation of gross fixed capital (C), direct investment from abroad (FDI), and the trade openness (TO) are the controlling variables.

$$MVA_{it} = \beta_0 + \beta_1 MVA_{it-1} + \beta_2 RER_{it} + \beta_3 CC_{it} + \beta_4 L_{it} + \beta_5 C_{it} + \beta_5 FDI_{it} + \beta_6 TO_{it} + \mu_{it} + v_t + e_{it} \quad (1)$$

This model examines data collected from the N-10 nations between 2015 and 2021 in the panel data model. The period is selected based on data availability and to capture global efforts to align with the Sustainable Development Goals (SDGs) and increase industrial reform across the N-10 countries. β_0 is constant, β_1- β_6 are coefficient values, μ_i is an unobserved country-specific effect, v_t is a time-specific effect, e_{it} is the error term, i denotes country and t denotes time.

The study uses the Generalized Method of Moments (GMM) to estimate the model, as it offers several advantages. First, GMM is better suited than simple fixed effects or OLS because it can address various econometric challenges, including multicollinearity, serial correlation, and country-specific effects commonly found in panel data. Second, it is extensively used to tackle the issue of endogeneity in panel data estimation (Arellano & Bover, 1995; Blundell & Bond, 2023). Third, GMM effectively mitigates problems related to simultaneity or reverse causality.

Based on the World Development Indicator (WDI) data from the World Bank; forest rents, mineral, coal, natural gas, and oil added together contribute to total natural resource rents (RER), which are then expressed as a percentage of GDP, while manufacturing value added (MVA) represents a share of manufacturing value added to GDP (%). Moreover, control of corruption (CC) reflects opinions about how often official authority is abused for personal interest, growth labor (L) is derived from the overall number of labors, capital (C) shows a share of the formation of gross-fixed capital to GDP (%) and direct investment from abroad (FDI) is share of FDI inflow to GDP (%). The variable description and data source are provided in Table 1.

Table 1 Variable Description and Source of Data

Variable	Description	Measurement	Source
MVA	Manufacturing Value Added	Share (%) of manufacturing value added to GDP	World Development Indicator (WDI), 2023
RER	Total Natural Resources Rents	Share (%) of the sum of oil rents, natural gas rents, coal rents, mineral rents and forest rents to GDP	WDI, 2023
CC	Corruption Control	Control of corruption (CC) reflects opinions about how often official authority is abused for personal interest	Worldwide Governance Indicator (WGI), 2023
L	Labor force growth	Derived from the overall number of labor (%)	WDI, 2023
C	Capital	Share (%) Gross fixed capital formation to GDP	WDI, 2023
FDI	Direct Investment from Abroad	Share (%) of foreign direct investment inflow to GDP	WDI, 2023
TO	The Openness of Trade	Share (%) of total trade to GDP	WDI, 2023

Source: Processed by author from (i) Mesagan et al., (2023); (ii) Tabash et al., (2022).

Result and Discussion

The dependent and independent variables' trends are descriptively analyzed in Table 2 using the standard deviation, median, mean, and minimum and maximum values. The results indicate that the average MVA (manufacturing value added) value is 17.34%, which shows the average trend of manufacturing value added in 10 countries. Likewise, the RER (natural resource rent) value of 4.69% shows the percentage of natural resource use in GDP. Next is the average CC (control of corruption) value of -0.68, which shows low corruption control. Then, respectively, the average value of L (labor) was 1.56%, C (capital) was 25.7%, FDI (foreign direct investment) was 1.84%, and TO (trade openness) was 56.76 %.

Table 2 Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Minimum	Maximum
MVA	70	17.341	3.898	8.68	24.617
RER	70	4.69	6.964	0.259	34.24
CC	70	-0.683	0.274	-1.096	-0.135
L	70	1.567	2.65	-6.496	7.278
C	70	25.706	6.883	14.289	34.571
FDI	70	1.847	1.345	.184	5.011
TO	70	56.762	39.326	16.352	186.468

Based on data from the N-10 countries, Figure 3 illustrates an adverse relationship between natural resource rents (RER) and manufacturing (MVA). The following section of this study will empirically investigate this relationship.

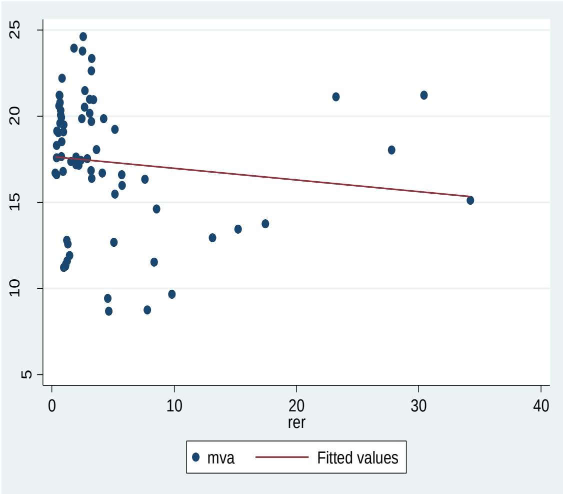

Figure 3 Natural Resource Rent (RER) and Industrialization (MVA)

Correlation analysis of all variables was carried out to see whether multicollinearity issues existed in the model. The coefficients of the correlation matrix between the variables are displayed in Table 3. The model generally shows minimal collinearity and does not have issues with multicollinearity among the variables except for TO and FDI. While the correlation between TO and FDI might raise concerns about multicollinearity or signal omitted variable bias, using the GMM estimation model overcomes the problem of multicollinearity and omitted variable bias. Thus, the model remains reliable for estimation despite the observed correlation.

Table 3 Correlation Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) MVA	1						
(2) RER	-0.122	1					
(3) CC	0.459	-0.391	1				
(4) L	-0.283	0.007	-0.184	1			
(5) C	0.676	0.224	0.267	-0.003	1		
(6) FDI	0.545	-0.275	0.466	-0.251	0.136	1	
(7) TO	0.605	-0.103	0.372	-0.197	0.334	0.856	1

Panel data analysis in this research follows Baltagi (2005), and regression in this analysis is conducted in Stata 16. This study employs GMM to estimate the equation. There are two types of GMM estimation: first differences GMM (FD-GMM) and System GMM (Sys-GMM). The reliability of the GMM estimator depends on two key tests: the Sargan test, which assesses the validity of the instruments, and the AR (2) test, which checks whether the error term is free from serial correlation.

In addition, to confirm that Sys-GMM is better than FD-GMM, it is necessary to show that the lag values of the dependent variable (L.MVA) in FD-GMM and Sys-GMM are significant and lie between the estimates of the fixed effects and pooled least squares. The model estimation with FD-GMM and Sys-GMM fulfills the Sargan test by not rejecting the null hypothesis, indicating instrument validity.

Furthermore, the model estimation of FD-GMM and Sys-GMM also fulfills the AR (2) test by not rejecting the null hypothesis, which means the error term is free from serial correlation. The lag values of the dependent variable in FD-GMM (0.727) and Sys-GMM (0.734) are between the estimates of the fixed effect (0.679) and pooled least square (0.855), which indicates that the FD-GMM and Sys-GMM estimates are unbiased.

While both estimates are valid, Sys-GMM is chosen as the best model because it is more efficient than FD-GMM. Table 4 shows a comparison of the results of panel data model estimation using FD-GMM, Sys-GMM, Fixed Effect (FEM), and Pooled Least Square (PLS).

Table 4 Effect of natural resources (RER) on manufacturing value-added (MVA)
MVA is dependent variable

	(FD-GMM)	(SYS-GMM)	(FEM)	(PLS)
	MVA	MVA	MVA	MVA
L.MVA	0.727***	0.734***	0.679***	0.855***
	(0.0555)	(0.0711)	(0.0931)	(0.0517)
RER	-0.0647***	-0.0562**	0.00885	0.000122
	(0.0250)	(0.0258)	(0.0491)	(0.0193)
CC	-4.427***	-3.835*	-4.084***	-0.827
	(1.641)	(1.989)	(1.509)	(0.536)
L	-0.0274	-0.0231	-0.0389	-0.0362
	(0.0452)	(0.0431)	(0.0400)	(0.0437)
C	0.150***	0.142***	0.156***	0.100***
	(0.0576)	(0.0459)	(0.0427)	(0.0266)
FDI	0.0319	0.00704	0.103	-0.0786
	(0.177)	(0.197)	(0.292)	(0.194)
TO	0.0380***	0.0249**	0.0331*	0.00891
	(0.0130)	(0.0121)	(0.0191)	(0.00609)
Constant	-3.797	-2.540	-3.085	-0.649
	(2.942)	(2.090)	(2.037)	(0.855)
Observations	50	60	60	60
Number of Country	10	10	10	
Sargan test	0.2884	0.5585		
Arellano Bond test, AR (2)	0.7350	0.7003		
R-squared			0.799	0.958

Note**:** *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses; **Source:** author's calculation with STATA

The adverse effect of natural resources (RER) on industrial output (MVA) shows symptoms of Dutch Disease. It can give rise to the natural resource curse, which reduces economic growth. A 1% increase in natural resources decreases manufacturing value added by

0.0562% at an alpha level of 5%. According to the Dutch disease theory, a resource surge may trigger an exchange rate rise and draw labor from the manufacturing sector to the increasing and more profitable natural resource sector, thereby reducing competitiveness in the industrial sector. This result is similar to research by (Nzeh Innocent et al., 2021) where natural resources can be a disincentive to the manufacturing sector. Another study with a similar result was conducted by (Mesagan et al., 2023), stating that natural resources significantly impact manufacturing growth negatively. This is related to the fact that income from natural resources is not appropriately used to finance the development of the manufacturing sector, partly due to the mismanagement of policies regarding natural resources. On the other hand, the result of this study is different from that of previous research led by (Pasaribu, 2020) which found that the added value of manufacturing was slightly impacted positively by increasing natural resource rents. While natural resource wealth may provide opportunities for economic development, it also poses challenges for managing natural resources effectively to encourage diversification and sustainable growth.

Control of corruption (CC) adversely affects manufacturing value added (MVA). It is known that a higher CC score reflects better corruption control. In this case, it means that corruption control is still poor, thus hurting the industry. A similar result was found in the study by (Nkemgha et al., 2022) which suggested that improving the quality of institutions through better corruption control in natural resources is necessary to encourage a positive influence on the added value of manufacturing. Furthermore, (Haggard & Tiede, 2011) stated that better corruption control could also lead to increased punishments for economic actors, which may hinder their expansion.

As measured by gross fixed capital formation, capital (C) has a significant and positive effect, meaning that every 1% increase in capital will increase manufacturing value added (MVA) by 0.142%. This result is consistent with the research conducted by (Mesagan et al., 2023). Increasing capital - such as machinery and infrastructure - is important in encouraging the diversification and export of more value-added manufacturing products. The positive effect implies that increased capital accumulation may result in better resource allocation and efficiency, both of which boost industrial expansion. This result is also consistent with that of the research by Tabash et al. (2022), which found that capital had a positive impact on GDP per capita.

Trade openness (TO) also has a positive and significant effect, with a significance level of 5%. This means that every 1% increase in trade openness will increase manufacturing value added (MVA) by 0.0249%. (Rowthorn & Ramaswamy, 1999) argued that a trade surplus in manufactured goods offsets a trade deficit in non-manufactured products and is positively associated with both employment levels and domestic manufacturing output. This viewpoint is further reinforced by (Dodzin & Vamvakidis, 2004). Moreover, trade openness encourages resources (labor, capital) to move toward more productive and competitive industries. This reallocation effect raises overall productivity across the industrial sector.

A nation's natural resource curse is the over-reliance on and inappropriate use of its natural resources, which do not support economic growth (Eregha & Mesagan, 2016; Lashitew et al., 2021). Numerous resource-rich nations, particularly those in Africa, have mishandled the income they receive from the export of their main commodities (Mesagan et al., 2023). Given the adverse impact of natural resource wealth on industrial production, this study documents the natural resource curse theory in those resource-rich nations.

Furthermore, numerous studies have evaluated the effect of natural resources on development and have proposed a negative correlation driven by factors such as obsolete technology (Papyrakis & Gerlagh, 2007), poor quality of institutions (Xu et al., 2019), instability in the economy and politics (Boschini et al., 2013), and limited access to the global market (Jena, 2021).

Conclusion

Numerous studies have explored the resource curse in terms of the connection between natural resources and economic growth. However, there has been limited research specifically evaluating the relationship between natural resources and industrialization.

This study evaluates how natural resource rents affect the manufacturing value added in the N-10 countries (excluding South Korea due to its limited natural resources). Results show that natural resources negatively impact manufacturing value added, causing the Dutch Disease and the natural resource curse. Additionally, control of corruption also harms industrial productivity. Meanwhile, capital and trade openness should be improved to drive industrialization and achieve economic growth.

Based on these findings, the N-10 countries are recommended to expand their manufacturing sectors by diversifying their economies beyond the conventional reliance on natural resources. Countries rich in natural resources need diversification, and the income obtained from natural resources can be used to encourage production capacity and diversification. Furthermore, institutions should be strengthened through better control of corruption in natural resource management to improve the productivity of the industrial sector.

To further explore the limitations of this research, this study suggests examining the impacts of natural resources in each country individually since the N-10 countries have various natural resources and may have different impacts on the industrial sector.

Author Contributions

Conceptualization: R.P.C and T.A.F.; Methodology: R.P.C.; Investigation: N.T and M.D.R.; Analysis, R.P.C.; Original Draft Preparation, R.P.C.; Review and Editing, T.A.F and N.T.; Visualization, M.D.R.

Conflicts of Interest

The authors declare no conflict of interest.

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