Analyzing the Impact of Natural Resource Depletion and Government Effectiveness on Happiness in Selected Oil-Exporting Countries

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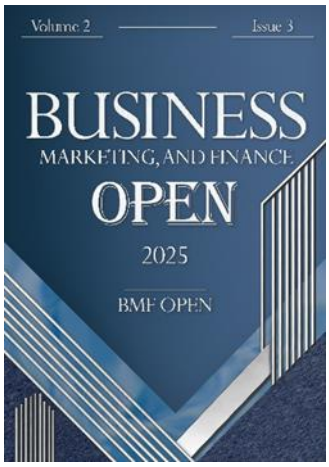

Citation: Ibrahim Askar, W., Hafezi, B., Salman, A. A., & Sharifi Renan, H. (2025). Analyzing the Impact of Natural Resource Depletion and Government Effectiveness on Happiness in Selected Oil-Exporting Countries. *Business, Marketing, and Finance Open*, 2(3), 147-154.

Received: 01 March 2025
Revised: 23 March 2025
Accepted: 05 April 2025
Published: 01 May 2025

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Abstract: The concept of happiness is a subject of study among economists. Happiness can be improved by economic, social, and institutional factors. Natural resource depletion, as an economic factor that also influences institutional indicators, can impact happiness. Therefore, this study examines whether natural resource depletion, considering government effectiveness, affects the happiness of people in oil-exporting countries. To this end, the Pooled Mean Group (PMG) model was applied to seven selected oil-exporting countries over the period from 2006 to 2023. The results indicate that the effect of natural resource depletion on happiness follows an inverted U-shape. In other words, initially, as the extraction of natural resources increases, higher oil revenues lead to improved individual incomes and, consequently, greater happiness. However, with further resource extraction, the depletion of natural resources and the increasing rent from these resources result in a long-term decline in happiness. Furthermore, government effectiveness has a positive long-term impact on happiness. Given that the effect of Gross Domestic Product (GDP) on happiness also follows an inverted U-shape in the long run, the Easterlin paradox is confirmed.

Keywords: Natural resource depletion, government effectiveness, resource rent

1. Introduction

Achieving happiness is the ultimate goal of human beings. All human activities, whether economic, political, social, or otherwise, are directed toward attaining this objective. Aristotle believed that failing to achieve this goal renews the motivation to think beyond materialism in pursuit of happiness. A segment of the broader public movement, alongside the foundation of behavioral economics, has given rise to a new line of research known as the economics of happiness. The economics of happiness relies on a broader concept of utility and well-being, including interdependent utility functions, procedural utility, and the interaction between rational and irrational influences in shaping economic behavior [1, 2]. This field has increasingly attracted the attention of researchers and policymakers in economics and business. The concept has been under scrutiny since the question of whether happiness is relative or absolute arose.

Richard Easterlin was the first modern economist to revisit the concept of happiness. He demonstrated that happiness in the United States increased from 1946 to 1967, experienced a decline in the 1970s, and then remained relatively unchanged over the following 24 years. Several decades later, Easterlin conducted a survey across various

countries and found that in the short term, economic growth and happiness are positively correlated, whereas in the long term, there is no significant relationship between trends in happiness and income. Another notable contradiction in this research was that life satisfaction in China did not improve despite a rise in real per capita Gross Domestic Product (GDP) [1]. By examining the notion that economic development is not the primary determinant of happiness, subsequent studies explored the effects of socio-economic conditions, health, and environmental quality on happiness. It is asserted that these factors can significantly influence well-being and happiness. Specifically, human interaction with nature is considered a crucial determinant of social and physiological well-being, health, and happiness [3].

Natural resource depletion refers to the gradual reduction or exhaustion of naturally occurring resources that are essential for the survival of humans and other living organisms. This phenomenon arises due to various factors, including excessive consumption, pollution, and ecosystem degradation. The depletion of national resources has significant implications for happiness and overall well-being in societies. The negative impact of resource depletion on happiness can be examined from the perspectives of economic consequences, health and well-being, and environmental degradation.

From an economic standpoint, natural resource depletion often leads to economic instability. Resource-rich countries may initially benefit from resource revenues, but mismanagement and over-reliance on these revenues can result in economic stagnation, inflation, and unemployment, all of which negatively impact happiness. For example, the interaction between resource revenues and governance quality can reduce happiness, as weak governance tends to amplify the adverse effects of resource dependence [4].

From a health and well-being perspective, natural capital is essential for promoting public health and overall well-being. When resources become scarce, access to essential services such as clean water, air quality, and food security diminishes. This scarcity can lead to poorer health outcomes and lower life satisfaction among populations. Furthermore, resource shortages impose constraints on investments in healthcare infrastructure, which, in turn, undermines social well-being [5].

From an environmental degradation perspective, resource depletion frequently leads to environmental destruction, which is associated with lower levels of happiness. Natural disasters resulting from environmental degradation can cause significant distress and loss of life, further straining communities already affected by resource scarcity [6].

On the other hand, increased resource extraction may enhance happiness from the perspectives of good governance and green innovation. Effective governance can contribute to the sustainable management of resource revenues, thereby improving social welfare [7], even in the face of depletion challenges. Good governance practices can strengthen institutional frameworks that promote equitable resource distribution and support public goods, thereby enhancing happiness. Additionally, emphasizing green innovation and sustainable practices can help societies adapt to resource constraints while improving overall well-being. Investments in renewable energy and sustainable technologies not only mitigate resource depletion but also foster economic growth and happiness [8].

Consequently, while natural resource depletion is often associated with economic instability and environmental degradation, it can lead to reduced happiness and well-being. Effective governance and innovative approaches can help mitigate these negative effects and enhance overall well-being. In fact, resource revenues in a country can have both positive and negative effects. One reason for the positive impact of oil revenues is the enhancement of security in oil-producing countries. Given that increased security provides people with greater peace of mind, it can have a positive effect on happiness. On the other hand, some studies have shown that oil rents negatively affect

institutional indicators, thereby reducing economic growth. This negative impact on economic growth and development may also have consequences for citizens' life satisfaction. Weak resource management is often at the root of numerous conflicts. Improved government decision-making regarding resource distribution can enhance resource efficiency and, consequently, optimize the use of natural resources. Additionally, it is suggested that natural resources should be utilized cautiously to ensure their preservation for future generations and to achieve sustainable development. The adverse effects of resource extraction and the loss of well-being can only be minimized if resource revenues are reinvested in the development of other capital assets. More precisely, if natural resources are being depleted, the revenues from their exploitation should be directed toward human development and the creation of essential capital to enhance human health, well-being, and intergenerational welfare [9-11].

Several studies have examined the impact of natural resources on happiness. Faraji Dizaji et al. (2023) found that natural resource rents negatively affect happiness, whereas good governance has a positive impact. Moreover, the interaction between resource rents and good governance was negative, indicating that natural resource rents weaken governance quality, thereby reducing happiness [4]. Sedaghat Kalmarzi et al. (2023) analyzed the effect of oil revenue rents on happiness inequality in selected OPEC countries from 2005 to 2012, revealing a nonlinear impact in which happiness inequality initially decreased but increased beyond a certain threshold. In a separate study, they confirmed that the effect of oil rents on happiness is both nonlinear and threshold-dependent [10]. Ahmad et al. (2023) demonstrated that natural resources and financial risks reduce human well-being in transitional economies, whereas green innovation and economic globalization contribute positively to human welfare. Their findings also indicated that natural resources, financial risks, and economic globalization drive human well-being but not the other way around [8]. Similarly, Slesman (2024) concluded that oil rents (including total and disaggregated resource rents) do not have an adverse effect on happiness or subjective well-being, contradicting recent global studies [2]. Additionally, Slesman (2022) refuted the hypothesis that total and disaggregated resource rents, including oil rents, negatively affect happiness, asserting that the resource curse or resource blessing theory does not apply to happiness and well-being [12]. Mignamissi and Kuete (2021) discovered that natural resource rents reduce happiness in the studied countries, with varying effects depending on political systems and development levels [13]. This phenomenon was more pronounced in weak democracies. Their study also showed that oil and gas rents had a significantly negative impact on happiness, whereas rents from forests and mining did not have a statistically significant effect.

Overall, governments play diverse roles in preserving the productivity of natural resources such as oil. Governments can either enhance the market value of natural resources or exploit them for political interests, which may lead to reduced resource efficiency [9]. Therefore, government performance and improvements in effectiveness contribute to the political, social, and economic development of a country, ultimately influencing individuals' happiness [14, 15]. Effective government policies can help manage the economy and natural resources, thereby fostering national development. Moreover, there is a possibility that, initially, resource revenues improve institutional quality and governance indicators, including government effectiveness. However, beyond a certain threshold, the impact of resource revenues, such as those from oil and gas, on governance indicators becomes negative. Furthermore, the relationship between natural resource depletion and happiness in resource-dependent countries, considering government effectiveness, remains ambiguous. The literature on this perspective is limited, and few studies have highlighted this relationship through the natural resource curse phenomenon.

Thus, investigating the impact of natural resource depletion on happiness, while considering government effectiveness, can provide policymakers with insights into how to manage and regulate resource extraction. Given

the importance of natural resource depletion, particularly oil, and its impact on human life, and considering that the ultimate goal of every individual is to achieve life satisfaction and happiness, this study aims to examine the impact of natural resource depletion, in light of government effectiveness, on happiness in selected oil-exporting countries.

2. Methodology

Given the objective of this study, which is to analyze the effect of natural resource depletion and government effectiveness on happiness in selected Islamic countries, the study employs a dynamic heterogeneous panel data model using the Pooled Mean Group (PMG) method, introduced by Pesaran, Shin, and Smith (1999). For this purpose, data from seven selected oil-exporting countries, namely Indonesia, Iran, Iraq, Jordan, Kuwait, Libya, and Nigeria, covering the period from 2006 to 2022, were used.

To estimate the model, the study follows the methodological framework of Slesman (2023), with the following functional form presented in Equation (1):

happy_it = β_1 + β_2 natural_it + β_3 natural_it^2 + β_4 Gover_it + β_5 LGDP_it + β_6 LGDP_it^2 + ∈_it (1)

In this study, natural resource depletion is represented by the variable natural, which is measured using the natural resource depletion index. The term natural^2 refers to the squared value of the natural resource depletion index. Government effectiveness is denoted as Gover, measured using the government effectiveness index, which assesses the quality of public services, the quality of the civil service and its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. This index is presented as a ranking from -2.5 to 2.5, with data sourced from the World Bank.

The dependent variable in this model is the happiness index, which was extracted from the World Happiness Report. The variable LGDP represents the logarithm of per capita Gross Domestic Product (GDP) and is used as an economic growth indicator in this study. The squared term LGDP^2 is included to examine the validity of the Easterlin paradox.

Given that the degree of stationarity of the data includes both I(0) and I(1) processes, the study employs the vector autoregressive (VAR) model for panel data, as introduced by Pesaran et al. (1999), using the PMG method. The corresponding error correction model (ECM) is specified as follows:

Δhappy_it = α + ∑(j=1)^(n_1) b_j Δhappy(it-j) + ∑(j=1)^(n_2) Øj ΔLGDPP(it-j)^2 + ∑(j=1)^(n_3) π_j ΔLGDPP_(it-j) + ∑(j=0)^(n_4) d_j Δgover(it-j) + ∑(i=0)^(n_5) e_i Δnatural(it-j) + ∑(i=0)^(n_6) ϑ_i Δnatural^2(it-j) + θ_0 happy_(it-1) + θ_1 LGDPP_(it-1) + θ_2 LGDP^2_(it-1) + θ_3 natural_(it-1) + θ_4 natural^2_(it-1) + θ_5 gover_(it-1) + ξ_it (2)

The results presented in Table (2) show the estimated coefficients of the model specified in Equation (3), representing both long-term and short-term effects. The parameter α_j represents the intercept of the estimated model, while c_2i, d_j, e_i, ϑ_i, π_j, θ_0, θ_1, …, θ_5 denote the estimated coefficients, and ξ_it represents the error term. The Δ symbol indicates the first-order difference of variables. In Equation (3), the lagged variables are used as instrumental variables. The estimation results for the panel data model, based on Equations (1) and (2), were obtained using EViews 12.

3. Findings and Results

It is essential to determine the stationarity of variables before proceeding with any estimation. In panel data analysis, before selecting a stationarity test, it must be determined whether cross-sectional units (countries) are independent or dependent on each other. This question is addressed using Pesaran's cross-sectional dependence (CD) test, where the null hypothesis states that cross-sections are independent, while the alternative hypothesis suggests dependence among cross-sections.

Table (1) presents the results of Pesaran's cross-sectional dependence test for the research model.

Table 1. Pesaran's Cross-Sectional Dependence Test Results

Test Hypothesis	Test Statistic	Probability	Test Result
Null Hypothesis: Cross-sections are independent	-0.645	0.600	Cannot reject the null hypothesis

The results in Table (1) indicate that the probability value for the cross-sectional dependence test statistic is greater than 0.05. Thus, the null hypothesis of cross-sectional independence cannot be rejected, implying that cross-sections are independent. In this case, it is valid to use standard panel unit root tests, such as the Im, Pesaran, and Shin (IPS) test. The results are shown in Table (2).

Table 2. Panel Unit Root Test Results

Variable Name	Symbol	IPS Test Statistic	Probability	Result
Log of GDP per capita	LGDPP	-7.8332	0.000	Stationary
Happiness Index	Happy	-35.2705	0.000	Stationary
Natural Resource Depletion Index	Natural	0.3475	0.6359	Non-stationary
Government Effectiveness Index	Gover	0.5013	0.6919	Non-stationary
Log of GDP per capita (first difference)	ΔLGDP	-0.4835	0.000	Stationary
Happiness Index (first difference)	ΔHappy	-7.7602	0.000	Stationary
Government Effectiveness Index (first difference)	ΔGover	-6.0911	0.108	Stationary
Natural Resource Depletion Index (first difference)	ΔNatural	4.6656	0.010	Stationary

Since the results of the panel unit root test confirm that the variables are integrated of order one (I(1)), the next step involves testing for the presence of long-term equilibrium relationships among the variables. For this purpose, the Westerlund panel cointegration test was employed, with the results presented in Table (3).

Table 3. Westerlund Cointegration Test (Intercept and Trend)

Test Type	Cointegration Test Statistic
Within-group statistics	1.8799 (0.031)
Full panel statistics	1.9096 (0.0281)

As shown in the results above, given that the probability values of the computed test statistics are less than 0.05, the presence of cointegration or long-term relationships among the selected variables is confirmed. Therefore, the specified model can be estimated using the Pooled Mean Group (PMG) method, as introduced by Pesaran et al. (1999).

Table 4. PMG Model Estimation Results for ARDL (2,1,1,1,1)

Variable Name	Symbol	Coefficient	t-Statistic	Probability
Natural Resource Depletion Index	Nature	0.67	0.24	0.000
Squared Natural Resource Depletion Index	Nature^2	-0.24	-5.10	0.000
Government Effectiveness Index	GOVER	0.63	13.4459	0.000
Log of GDP per capita	LGDP	0.13	7.3473	0.005
Squared Log of GDP per capita	LGDP^2	-0.2605	-3.088	0.0033
Error Correction Term	ECM	-0.7564	-4.5393	0.000

Short-term Government Effectiveness Index	ΔGOVER	-0.1494	-0.2305	0.7277
Short-term Squared Natural Resource Depletion Index	ΔNature^2	-0.0012	-1.0768	0.2852
Short-term Natural Resource Depletion Index	ΔNature	-0.052	-1.3644	0.1788
Short-term GDP per capita	ΔLGDPP	0.3024	1.3473	0.000
Intercept	C	0.0315	1.5053	0.1733

According to the estimation results in Table (4), the effect of natural resource depletion on happiness follows an inverted U-shape. Initially, the extraction of natural resources leads to increased happiness, but over time, its long-term effect on happiness becomes negative. However, in the short term, the impact of this variable on the happiness index is not statistically significant. Similarly, the impact of the logarithm of GDP per capita on the happiness index exhibits an inverted U-shape in the long run. This suggests that an initial increase in wealth enhances happiness, but as wealth accumulation continues, its impact on happiness turns negative.

The effect of government effectiveness on happiness is positive and statistically significant in the long run. The error correction coefficient is negative, with an absolute value less than one, and it is statistically significant. This indicates that in the short term, about 75% of the disequilibrium is adjusted, bringing the system back to its long-term trend.

4. Discussion and Conclusion

According to the estimation results, the impact of natural resource depletion on happiness follows a nonlinear inverted U-shaped pattern. In other words, at first, as resource extraction increases, happiness rises, but over time, as the depletion of resources continues, happiness declines. This finding suggests that mismanagement of natural resources may be a contributing factor to the decline in public satisfaction. Therefore, it is recommended that governments implement appropriate policies for sustainable resource management. Establishing sovereign wealth funds and investing revenues—especially for oil-exporting countries—can help improve the economic conditions of a country and, in turn, enhance public happiness. Additionally, adopting sustainable strategies can prevent the destruction of natural resources. Sustainable extraction methods and conservation practices can help preserve resources for future generations. Furthermore, investment in renewable resources can mitigate the negative effects of resource depletion. Diversifying investments in various economic sectors can also contribute to employment opportunities and increase people's sense of satisfaction [4, 5, 9].

The relationship between wealth and happiness also follows an inverted U-shaped pattern. Initially, an increase in GDP per capita leads to higher happiness levels. However, as GDP continues to grow, income inequality tends to rise. The initial benefits of economic growth may not be evenly distributed, leading to disparities in wealth and opportunities. Rising inequality can fuel social resentment and dissatisfaction among individuals who feel left behind, ultimately reducing overall happiness. Moreover, social comparisons play a significant role in this relationship. When individuals observe others with greater economic prosperity, they may experience feelings of inadequacy and reduced happiness, especially if they perceive upward mobility as unattainable. Initially, the potential for upward mobility may enhance happiness, but when income inequality reaches critical levels, it can have the opposite effect [2, 3, 10-12].

Economic growth also influences the quality of governance. As citizens become wealthier, their expectations for good governance increase. If these expectations are not met—due to issues such as corruption or ineffective governance—happiness may decline, even as GDP rises. This finding supports Easterlin's paradox, which suggests that beyond a certain point, income growth does not necessarily translate into increased happiness. Given the

inverted U-shaped impact of GDP per capita on happiness, it is recommended that countries implement policies to reduce the negative effects of economic growth beyond a certain threshold. In addition to economic expansion, policymakers should focus on fair income distribution through tax policies that promote a more equitable distribution of wealth. Enhancing social services and investing in public welfare can further improve happiness. Governments should prioritize investments in healthcare, education, and social services to enhance overall well-being.

Furthermore, the effectiveness of government has a positive impact on people's happiness. This implies that as government effectiveness improves, policies become more efficient and are better aligned with public welfare, leading to greater satisfaction. This finding supports the idea that effective governmental policies can reduce anxiety and stress in society, as greater governmental efficiency fosters a stronger sense of security among citizens. Additionally, improved government effectiveness strengthens social relationships. Since government effectiveness is linked to the ability to provide public services, maintain security, and create favorable conditions for economic growth, the results of this study indicate that governments capable of efficient resource management and welfare provision can significantly enhance citizen happiness. By establishing social and cultural infrastructures, governments can promote social cohesion, which is a key factor in increasing happiness.

Moreover, efficient governance enhances policymaking across various sectors, thereby facilitating social welfare and happiness. Governments should actively engage in continuous evaluation of their processes to identify inefficiencies and areas for improvement. This strategy involves adopting a mindset of continuous improvement, with the goal of streamlining operations and enhancing service delivery. The integration of advanced technologies can significantly improve governmental efficiency. Digital tools can expedite service delivery, enhance data accessibility, and support informed decision-making. Providing educational and professional development opportunities for government employees can improve their skills and competencies, ultimately leading to more effective service delivery and operational efficiency.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all participants who participate in this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

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