Unraveling Determinants of FDI: Insights from Oil-Abundant Economies

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Article Information

Abstract

The significance of natural resources in shaping foreign direct investment (FDI) dynamics cannot be overstated. In oil-abundant countries, these resources act as catalysts and magnets for investment inflows. Against this backdrop, this research aims to dissect the determinants of FDI within oil-rich nations, focusing on four critical factors: natural resources, exchange rates, openness to trade, and market size. The study seeks to unravel the intricate interplay between resource endowments and investment attractiveness by leveraging panel data from six oil-abundant countries (the United States, China, Russia, Canada, Saudi Arabia, and the UAE) over nine years (2011–2019) and employing the fixed effect model as a robust methodology. The results reveal that all factors: natural resources, openness to trade, and market size are statistically significant in affecting FDI inflows. Due to the robust economic conditions in the countries studied exchange rate fluctuations have a limited impact on FDI. Instead, investors prioritize microeconomic factors such as labor wages, logistics costs, and telecommunication tariffs when evaluating business efficiency in investment destinations. Thus, this research provides actionable insights for policymakers to enhance the market environment for local producers, support trade through subsidies and incentives, and focus on resource exploration to attract foreign investors and stimulate economic growth.

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INTRODUCTION

Resource-rich nations wield a unique allure for investors seeking stable returns and diversification. When a nation possesses ample natural wealth, it fuels its growth and becomes an attractive destination for foreign capital. Investors recognize that resource abundance translates into competitive advantages—lower production costs, access to raw materials, and the potential for lucrative exports.

Foreign Direct Investment (FDI) is a critical driver of economic growth and global integration. As we delve into the determinants of FDI, one factor consistently emerges: the abundance of natural resources. For resource-abundant countries, possessing substantial reserves of energy, minerals, or other valuable commodities is akin to holding a strategic key.

Foreign Direct Investment (FDI) refers to capital inflows from private-sector or government-owned entities across national borders (Jhingan, M. L., 2004). Traditionally, FDI has been viewed as a catalyst for economic growth, fostering capital accumulation and job creation (Solow, 1956). However, recent developments in the global FDI landscape have expanded this perspective. Beyond mere capital infusion, FDI now encompasses technology transfer, knowledge sharing, and the development of local managerial expertise (Romer, 1986).

Resource-rich nations are often attractive destinations for resource-seeking FDI (Dunning, 2000). These coveted resources include mineral fuels, industrial minerals, metals, and agricultural products—sectors that benefit from the unique capabilities and market access offered by multinational enterprises (MNEs) (Dunning & Lundan, 2008). Notably, oil stands out as the most utilized natural resource globally.
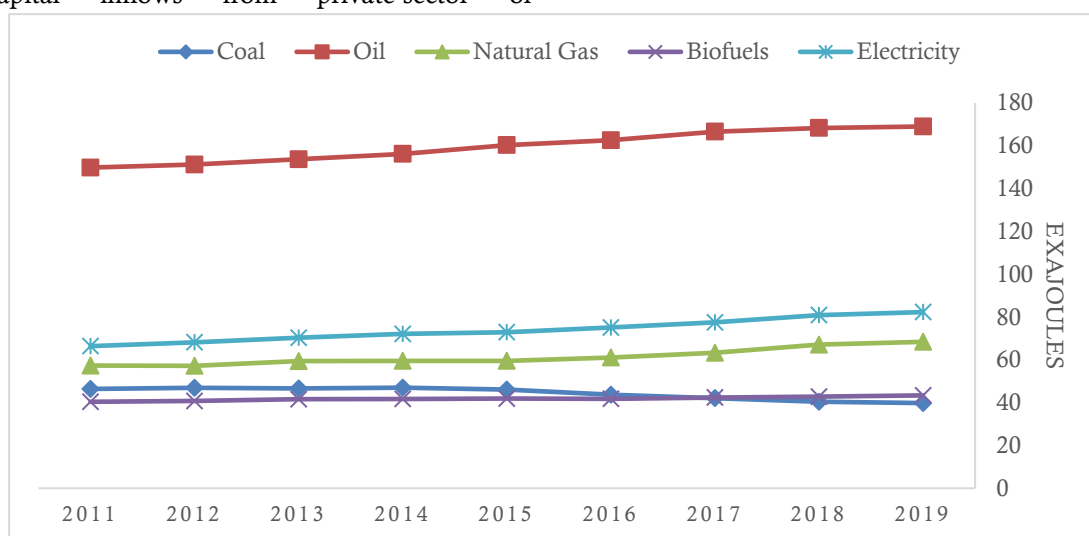

Figure 1. World Primary Energy Consumption Trend from 2011-2019
Source: BP Statistical Energy

Oil-abundant countries (OACs) have prospered due to substantial oil revenues, mitigating capital constraints (Askari & Jaber, 1999). Remarkably, OACs collectively hold approximately half of the world's oil reserves. Notable examples include the United States, Canada, and China, which possess significant oil wealth.
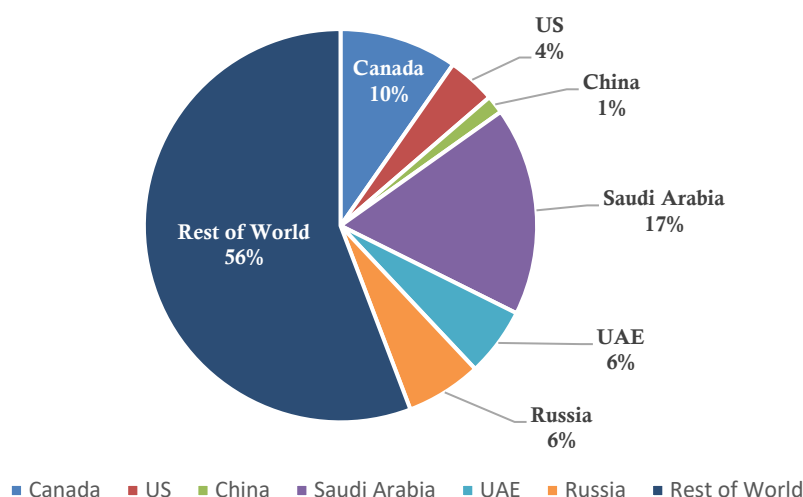
Figure 2. Oil Reserved Shares in The World 2020
Source: BP Statistical Energy

The prevailing consensus posits that resource-rich countries attract resource-seeking FDI. Empirical evidence supports this view, exemplified by Asiedu's (2013) findings of increased FDI inflows in extractive industries within Gulf Cooperation Council (GCC) countries, primarily driven by oil production. Similarly, Caribbean nations, blessed with natural resources, have effectively harnessed FDI (Sookram et al., 2022). However, Elheddad (2016) presents a contrasting perspective, reporting that FDI inflows to the GCC region are adversely affected by various natural resource proxies—namely, oil reserves, oil production, and oil prices.

Market size emerges as a critical factor. Larger markets facilitate specialization in production factors, thereby minimizing costs (Balassa, 1966). Asiedu (2002) underscores the significant influence of market size, often measured by GDP per capita, on FDI prospects. Notably, Siriopoulos et al. (2021) confirm a positive relationship between market size and FDI inflows in GCC countries. In contrast, Mina (2007) identifies a negative impact of market size based on research conducted within the GCC.

Exchange rate dynamics also play a role. When local currencies depreciate, foreign assets become more appealing to investors (Moosa, 2002). Recent studies in GCC countries reveal a negative correlation between exchange rates and

FDI. AlShammari et al. (2023) find that an appreciated host-country currency diminishes FDI. Intriguingly, the IMF (2018) identifies a favorable environment where exchange rates positively correlate with FDI in GCC countries.

Trade openness, characterized by fewer restrictions, attracts FDI (Moosa, 2002). Samargandi et al. (2022) empirically support this positive link between FDI and trade openness. Additionally, WTO and Euro-Mediterranean Union (EMU) membership enhance FDI inflows to Arab economies (Aziz & Mishra, 2016). However, Abdel-Rahman's (2002) study on the Kingdom of Saudi Arabia reveals a counterintuitive finding: trade openness negatively impacts FDI.

This paper focuses on the varying and conflicting impacts of key economic determinants—such as market size, exchange rate, trade openness, and natural resources—on Foreign Direct Investment (FDI) inflows in oil-rich countries. While previous studies provide differing conclusions (e.g., some find a positive influence of market size on FDI, while others report negative correlations), this paper seeks to clarify these discrepancies by analyzing panel data from six oil-abundant nations (the United States, Russia, China, Canada, Saudi Arabia, and the UAE).

Enhancing the focus of this research is imperative due to the diverse findings and

unresolved debates highlighted in prior studies, particularly concerning the relationships between key economic variables—namely, market size, exchange rates, trade openness, and natural resources—and their influence on Foreign Direct Investment (FDI) inflows. This study endeavors to bridge these gaps by providing a nuanced analysis and contributing greater clarity and precision to the academic discourse.

RESEARCH METHODS

This study investigates the impact of market size, exchange rates, trade openness, and natural resources on foreign direct investment (FDI). It utilizes panel data from six oil-abundant countries—namely, the United States, Russia, China, Saudi Arabia, Canada, and the United Arab Emirates—from 2011 to 2019.

Table 1. Types of Data and Its Sources

No	Variable	Symbol of Variable	Unit of Measurement	Data Sources
1	FDI	FDI	Net inflows in current USD	IMF
2	Market Size	GDP	GDP per Capita in US$	IMF
3	Openness to Trade	TRD	The total of exports and imports as a proportion of nominal GDP	UNCTAD
4	Exchange Rate	EXC	Local currency units relative to the US$	World Bank
5	Natural Resource	RES	Oil reserves in thousand million barrels	BP Statistical Review of World Energy 2022
		PRO	Oil Production in thousand barrels daily	BP Statistical Review of World Energy 2022

Source: Data Processed, 2024

According to Gujarati & Porter (2009), there are several ways to estimate panel data: (1) Common Effect Model (CEM), (2) Fixed Effect Model (FEM), and (3) Random Effect Model (REM). The CEM is a straightforward approach that combines time series and cross-sectional data without accounting for individual-specific effects.

$$y_i = \beta_0 + \beta_1 t_i + \beta_2 x_i + u_i \dots\dots\dots\dots\dots (1)$$

The Fixed Effect Model (FEM) analyzes changes within each cross-sectional unit over time. FEM considers unobserved heterogeneity, aia_iai (such as gender or cultural factors), to be correlated with the independent variables (Gujarati & Porter, 2009).

$$\ddot{y}_{it} = \beta_1 \ddot{x}_{it1} + \cdots + \beta_k \ddot{x}_{itk} + \ddot{u}_{it} \dots\dots\dots\dots (2)$$

The Random Effect Model (REM) is particularly useful when unobserved heterogeneity does not correlate with the explanatory variables. REM posits that individual intercepts are drawn randomly from a broader population.

$$y_{it} = \beta_0 + \beta_1 x_{it1} + \cdots + \beta_k x_{itk} + a_i + u_{it} \dots\dots (3)$$

According to Gujarati & Porter (2009), in selecting a model/estimation technique to test the regression equation to be estimated, three tests can be used: the Chow Test, the Lagrange Multiplier Test, and the Hausman Test.

The Chow Test evaluates the stability of the regression model's structure, helping choose between FEM and CEM. Specifically, under the null hypothesis (H_0) is CEM (no structural break), and alternative hypothesis (H_1) FEM (structural break).

After that, the Lagrange Multiplier test will be conducted to assess serial correlation in the model, aiding the choice between CEM and REM (Gujarati & Porter, 2009). Thus, H_0 represents the Common Effect Model (CEM), indicating no serial correlation, while and H_1 represents the Random Effect Model (REM).

Finally, the Hausman test examines simultaneity by evaluating whether an endogenous regressor correlates with the error term. The hypothesis in the Hausman test posits that, under the H_0, no simultaneity issues exist. In other words, if the H_0 is rejected, it implies that the REM is not appropriate and the FEM may be a better choice.

Ultimately, the Fixed Effect Model is the most practical choice, surpassing the Common and Random Effect Models. The Hausman test supports this conclusion by rejecting the null hypothesis.

In addition, the Fixed Effect Model was chosen in this paper because it effectively controls for unobserved heterogeneity across countries, which might influence foreign direct investment (FDI) inflows. Focusing on variations within countries over time, the Fixed Effect Model isolates the impact of economic variables like market size, trade, oil reserves, and oil production on FDI inflows. This approach ensures that time-invariant characteristics specific to each country do not bias the results, leading to more accurate and reliable findings.

Furthermore, to ensure unbiased estimation, adherence to Gauss-Markov assumptions is crucial. These assumptions include no perfect collinearity (multicollinearity), serial correlation (autocorrelation), or homoskedasticity.

Specifically, FEM specifications are as follows:

$$ln(FDI)_{it} = \beta_0 + \beta_1 \, ln(GDP)_{it} + \beta_2 TRD_{it} + \beta_3 EXC_{it} + \beta_4 \, ln(RES)_{it} + \beta_5 PRO_{it} + u_{it} \quad (4)$$

Some variables were converted into their natural logarithms to achieve better, more consistent, and reliable empirical results. Where, $ln(FDI)_{it}$ is logarithmic forms of FDI of countries i on period time t; $ln(GDP)_{it}$ is a logarithmic form of gross domestic products of countries i on period time t; $ln(RES)_{it}$ a logarithmic form of oil reserves of countries i on period time t; TRD_{it} denotes as openness to the trade of countries i on period time t; EXC_{it} denotes as exchange rates of countries i on period time t; PRO_{it} denotes as oil production of countries i on period time t; u_{it} denotes as the error term.

RESULTS AND DISCUSSION

Foreign direct investment is most often cited as a contributor to national development since it plays a role in filling the resource gap between domestic savings, government revenue, foreign exchange, managerial skills, and the targeted level of these resources required to achieve significant growth and development (Todaro & Smith, 2012).

Figure 3 represents net foreign direct investment (FDI) inflows across six oil-abundant countries—namely, the United States, Russia, China, Canada, Saudi Arabia, and the United Arab Emirates—over nine years (2011 to 2019).

During the period from 2011 to 2019, China consistently demonstrated steady growth in FDI. The United States experienced fluctuations but maintained a robust position. Russia, Saudi Arabia, and the United Arab Emirates exhibited varying patterns: Russia's FDI fluctuated with a peak in 2013, Saudi Arabia's inflows increased until around 2015 and then declined, and the UAE experienced substantial growth until around 2015, followed by a subsequent decline. Canada's FDI remained relatively stable without significant upward or downward trends.
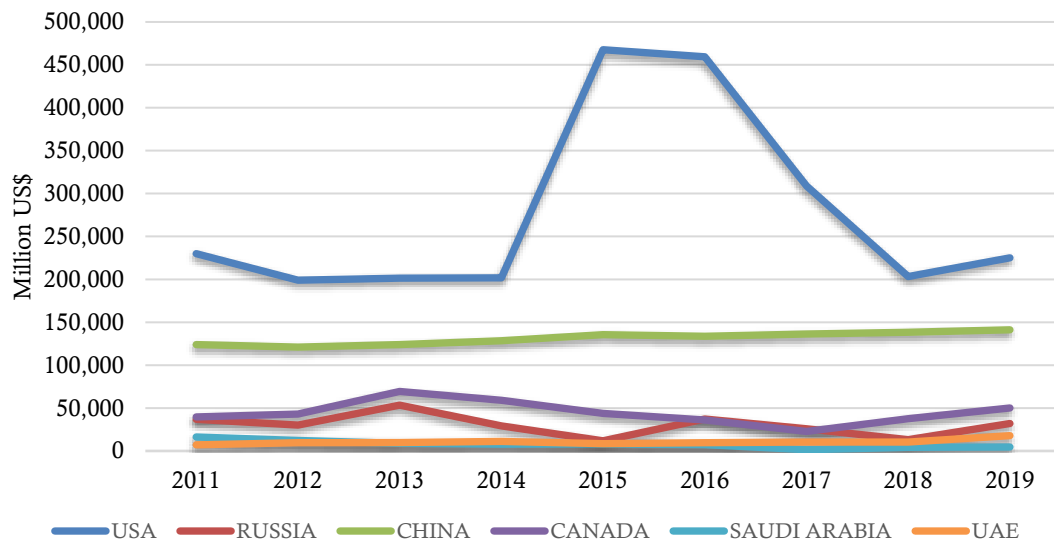
Figure 3. Net Value of Foreign Direct Investment Trend of Oil-abundant Countries from 2011-2019
Source: UNCTAD

Our study rigorously evaluated the Gauss-Markov assumptions for the fixed effect model. Notably, severe multicollinearity issues were absent. However, we observed heteroscedasticity in the error variance across all models. Additionally, the residuals in the fixed effect model exhibited temporal correlation. Consequently, we employed clustered standard errors for decision-making.

Table 2. Regression Result after Correcting Standard Error

	Dependent variable:
	ln(FDI)
ln(GDP)	1.899***
	(0.508)
TRD	0.016*
	(0.009)
EXC	0.003
	(0.005)
ln(RES)	-4.225***
	(1.327)
PRO	0.209***
	(0.069)
Observations	54
R^2	0.923
Adjusted R^2	0.898
F Statistic	5.302*** (df = 5; 43)

Note: *Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Source: Data Processed, 2024

The Fixed Effect Model equation for determining $\log(FDI)$ in 2010 to 2019 is:

$$ln(FDI)_{it} = 1.889\ ln(GDP)_{it} + 0.016\ TRD_{it} + 0.003\ EXC_{it} - 4.225\ ln(RES)_{it} + 0.209\ PRO_{it} + u_{it} \dots\dots\dots(5)$$

The estimation results highlight the significance of market size, represented by GDP. Specifically, it shows a positive coefficient significant at the 1% level. A coefficient value of 1.899 suggests that a 1% rise in GDP leads to a 1.89% increase in FDI inflows. This underscores the pivotal role of market size as a determinant of FDI. Balassa (1966) posited that a sufficiently large domestic market can minimize production costs, making it an attractive factor for investors. Moreover, larger markets often facilitate higher trade volumes, providing more opportunities for imports and exports. This relationship could indirectly affect FDI inflows by making the country more attractive to foreign investors.

The findings align with prior research by Asiedu (2002) and Siriopoulos et al. (2021) in GCC countries, emphasizing the positive impact of market size on FDI. However, this study's findings diverge from the conclusions reached by Mina (2007), who found no significant influence of the economy's size on FDI inflows in GCC nations.

The estimation outcome regarding the trade openness variable, indicated by the total of exports and imports as a percentage of GDP, is positively significant at the 10% level for FDI. A coefficient value of 0.016 implies that a 1% increase in trade openness results in a 0.016% increase in FDI inflows.

Interestingly, the results contrast with Abdel-Rahman's (2002) study for the Kingdom of Saudi Arabia, where trade adversely correlated with FDI inflows, suggesting that investors primarily consider other crucial factors when making investment decisions. However, the findings align with Aziz & Mishra (2016) and Samargandi et al. (2022), who conducted studies on Arab economies, emphasizing trade's positive impact on attracting FDI. Thus, integrating into the global economy through trade facilitates FDI inflows.

Exchange rate volatility does not deter investors in oil-rich nations with stable economic environments. Instead, their decision-making processes are more strongly influenced by pragmatic considerations such as labor costs, logistics efficiency, and the affordability of telecommunication services. These factors arguably offer more direct and tangible effects on operational and investment costs, rendering exchange rate fluctuations less critical.

Moreover, the study suggests that in countries with resilient macroeconomic frameworks, consistent growth, and well-managed fiscal policies, the importance of exchange rates diminishes. This finding aligns with broader economic theories suggesting that when a country achieves a certain level of economic maturity and stability, other location-specific advantages tend to overshadow currency fluctuations as determinants of FDI inflows.

These results contradict the findings observed in studies conducted on developed and developing countries by AlShammari et al. (2023). They found that a rise in the host country's currency is significantly linked to decreases in FDI inflows, as a stronger host-country currency reduces the share of benefits obtained by investors. Moreover, these results align with the study conducted by the IMF (2018), which discovered that a favorable exchange rate in the GCC countries positively and significantly influences FDI inflows.

The estimation result for the oil reserves variable indicates negative significance at the 1% level. Specifically, a 1% increase in oil reserves leads to a 4.225% decrease in FDI inflows. These results are consistent with the findings observed in studies conducted on both developed and developing countries by Mina (2007), which also observed a negative influence of oil reserves on FDI inflows.

However, Mina's (2007) findings align with the oil production findings. The estimation result for oil production is positively significant at the 1% level for FDI. The coefficient result of 0.209 indicates that a 1,000-barrel increase in oil production leads to a 0.209% increase in FDI inflows. This might be attributed to these wealthy

oil-producing nations possessing ample financial resources, reducing their reliance on foreign finance. Furthermore, the findings obtained align with the study by Morisset (2001), which found that increased oil production positively impacts FDI inflows, as the availability of natural resources plays a crucial role in attracting foreign investment.

Policymakers in oil-abundant countries can derive several critical insights from the findings of this study to enhance their ability to attract Foreign Direct Investment (FDI). Firstly, economic growth should be prioritized to expand market size, a significant determinant of FDI inflows. This objective can be achieved through strategic investments in infrastructure, establishing stable economic policies, and creating a conducive business environment. Secondly, the efficient and sustainable utilization of natural resources, such as oil reserves and production, should be a central policy focus. Implementing transparent resource management practices and providing targeted incentives to attract investment in resource-related sectors are crucial.

Furthermore, encouraging trade openness by reducing trade barriers and fostering international trade agreements can significantly enhance the appeal of these economies to foreign investors. Lastly, although the study finds exchange rate stability statistically insignificant in influencing FDI inflows, ensuring currency stability remains important for minimizing economic uncertainties and fostering a favorable investment climate. These implications underscore the importance of well-designed policies that leverage economic and natural resource advantages to attract sustainable FDI.

CONCLUSION

In unraveling the determinants of Foreign Direct Investment (FDI) within oil-abundant countries, the studies underscore natural resources' pivotal role. However, abundant oil reserves have a negative influence on FDI inflows. Interestingly, increased oil production positively impacts FDI inflows in these wealthy oil-producing nations. Therefore, policymakers must optimize resource utilization while diversifying the economy by encouraging value addition and downstream industries to maximize FDI benefits.

Furthermore, other supporting factors, such as market size and openness to trade, emerge as key attractors of FDI inflows in oil-abundant countries. Thus, oil-abundant countries should consider leveraging market size as a competitive advantage. Moreover, the role of government is important in fostering trade openness through bilateral agreements and regional partnerships and in promoting investment-friendly policies that attract FDI.

In contrast, the exchange rate remains an outlier, failing to influence FDI significantly. The limited impact of the exchange rate variable on Foreign Direct Investment (FDI) may stem from the fact that oil-abundant countries exhibit robust economic conditions. Consequently, further research must consider other critical factors for investors when assessing business efficiency prospects in oil-abundant countries.

While insightful, the study on the determinants of Foreign Direct Investment (FDI) in oil-abundant countries presents several limitations that should be acknowledged for a comprehensive understanding. Firstly, due to the lack of data access, the analysis is limited by its focus on a specific set of countries—namely, the United States, Russia, China, Canada, Saudi Arabia, and the United Arab Emirates. This narrow scope may limit the generalizability of the findings to other oil-rich nations or regions with different economic and political contexts.

Secondly, the study relies on secondary data from the IMF, World Bank, UNCTAD, and BP Statistics sources. While these are reputable, pre-existing data may introduce biases or limitations in capturing real-time dynamics or country-specific nuances. Furthermore, omitting certain socio-political factors—such as political stability, governance quality, and corruption levels—could limit the analysis, as these factors often play a significant role in attracting FDI.

Thirdly, the study's fixed-effect model, while effective in controlling for unobserved heterogeneity, might not fully capture the

dynamic relationships between variables over time. The study could have benefited from employing dynamic panel data techniques, such as the Generalized Method of Moments (GMM), to address potential endogeneity issues and provide a more robust analysis.

For future research, expanding the geographical scope to include oil-rich regions in Africa and Latin America would allow for a broader understanding of FDI determinants under varied contexts. Incorporating additional variables—such as political risk indices, governance quality, and infrastructure development—could provide more comprehensive insights into the factors driving FDI inflows. Studies could also benefit from utilizing dynamic panel data techniques or time-series analyses to capture the evolving nature of these determinants. Exploring sector-specific FDI trends, particularly in non-oil sectors, would shed light on diversification strategies and their economic impact. Finally, examining the implications of global challenges—such as climate change policies and energy transition strategies on FDI inflows to oil-rich countries could contribute valuable perspectives to this field of study.

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