

Oil Dependency: Impact on the economy of Ecuador

Dependencia petrolera: Impacto en la economía del Ecuador

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Abstract

Oil is Ecuador's main export product and its financial income an important part of the General State Budget. Being Ecuador a country dependent on crude oil is the reason why this investigation is carried out. For this purpose, an investigation with a quantitative approach was used, with a descriptive and explanatory scope strengthened in the Solow model, for which an econometric model with time series data was estimated using the Ordinary Least Squares (OLS) method. The results show that oil barrel exports have a positive effect on economic growth. Likewise, it is concluded that oil imports, the price of oil, will have a greater dynamism in economic growth, since there is a strong causality with the aforementioned variables.

Key words: Economic growth, exports of barrels of oil, Solow model, Ordinary Least Squares, Ecuador.

Resumen

El petróleo es el principal producto de exportación de Ecuador y sus ingresos financian una parte importante del Presupuesto General del Estado. Al ser el Ecuador un país dependiente del crudo es el motivo por el cual se lleva a cabo esta investigación. Para este propósito, se empleó una investigación con enfoque cuantitativo, con un alcance descriptivo y explicativo basándose en el modelo de Solow, para lo cual se estimó un modelo econométrico con datos de series temporales mediante el método de Mínimos Cuadrados Ordinarios (MCO). Los resultados demostraron que las exportaciones de barriles de petróleo tienen un efecto positivo en el crecimiento económico. Así mismo se concluye que las importaciones petroleras, el precio del petróleo, tendrán un mayor dinamismo en el crecimiento económico, ya que existe una fuerte causalidad con las variables ya mencionadas.

Palabras clave: Crecimiento económico; exportaciones; petróleo; modelo de Solo; Mínimos Cuadrados ordinarios.

INTRODUCCIÓN

The economic policy that was established during the oil boom of the 1970s was the trigger for the debt crisis of the 1980s. This crisis, in turn, led to the liberalization of the sector in the 1990s, resulting in a decrease in state control over oil policy. These developments influenced the redistribution of the benefits generated by the new oil bonanza. Unlike the first oil boom, the second found the Ecuadorian economy more dynamic, although facing problems similar to those experienced forty years earlier. During this second phase, and despite the fact that the price of oil doubled in real terms, economic growth was slower compared to the period of the first oil boom (Fontaine, 2002).

Oil has generated a deep dependence in Ecuador. Although it is not possible to completely abandon this development model, it is feasible to reorient policies towards a more equitable and environmentally sustainable approach. In this context, it is essential to initiate a national debate on the possibilities of a post-oil future for the country, especially considering Ecuador's likely transition to a net oil-importing state early in the next decade. It is time to act as if oil has already run out and look for development alternatives to overcome this dependence, applying the philosophy of 'seeding oil' in a country that requires significant private investment to improve its quality of life (Herrera, 2013). Oil is a finite resource, and, in the case of Ecuador, untapped reserves are scarce. In addition, international price prospects could be more promising, and anticipated crude oil sales further restrict future revenues that the state could obtain from hydrocarbon exports. According to Bylund (2018), economic growth reflects the ability of an economy to meet the needs of its inhabitants, i.e., to generate welfare. However, GDP is a limited indicator for measuring this, as its accuracy can be compromised by those who benefit from manipulating these statistics.

Since 1972, oil has been the mainstay of the Ecuadorian economy, marking the country's economic cycles with its volatility. There have been critical moments, such as the 1999 crisis and the current one, as well as periods of prosperity in the 1970s and at the beginning of the 21st century (2005-2014). After almost five decades of oil exploitation, Ecuador continues to face the cha-

llenges of a poorly diversified economy and high debt while the population grapples with persistent problems of poverty, social exclusion, and underemployment (Larrea, 2020). For the last four decades, the Ecuadorian economy has depended on oil exports, a situation that originated in the oil boom of the 1970s. Despite the temporary prosperity generated by high oil prices in international markets, this dependence did not translate into a substantial improvement in the living conditions of Ecuadorians or into development in accordance with the available resources. The oil wealth was not adequately exploited due to the mismanagement of the governments in office, resulting in significant external indebtedness (González Márquez *et al.*, 2018).

The Ecuadorian economy has traditionally been dependent on oil exports, in addition to other exportable products that mean a considerable economic contribution. It is crucial to maintain constant innovation and development in these sectors to ensure sustained economic growth. Currently, Ecuador's exports have diversified, encompassing both oil and non-oil products, including both traditional and more innovative items. Exports accounted for 18% of Ecuador's GDP, with oil exports standing out as a critical component of the national economy (Pullutasig, 2022). In contrast, the leading developed countries maintain strategic oil reserves for use in critical situations, ensuring domestic consumption for a few months. However, a reduction in these inventories has been reported, placing them below the average of the last five years. This data coincides with evidence suggesting that world production of conventional crude oil could be in decline, a phenomenon analyzed and explained through the 'Hubbert curve,' a methodology developed by geologist King Hubbert to study oil production in the United States (Gorraiz, 2021).

With respect to economic growth, some authors have pointed to empirical evidence that demonstrates the relationship between variables such as GDP and crude oil prices, migrant remittances, mainly from Europe, and the level of Ecuadorian oil exports, which play an essential role in shaping Ecuador's economic growth. (Bernal Yamuca *et al.*, 2023).

This research set out to analyze the impact of oil barrel exports on Ecuador's economic growth. These revenues are fundamental for public investment in various economic sectors.

The study seeks to understand the current relationship between these oil revenues and economic growth, evaluating the existence of dynamism between these two economic variables.

METHODOLOGY

Research design approach and scope of research

This study has been developed under a quantitative approach based on the analysis of GDP in relation to annual oil exports, as well as other critical variables, including oil imports, the price per barrel, and the unemployment rate (EAP). These variables serve as support for verifying and obtaining results and identifying a specific research problem through literature review and empirical evidence.

The research design is non-experimental and longitudinal, employing time series data over an extended period to identify and examine the relationship and impact between the variables of interest.

The research has descriptive and explanatory objectives. It is descriptive in the sense that it seeks to identify and define the variables both theoretically and statistically, estimating them using a linear econometric model. It is explanatory since its primary purpose is to quantify and evaluate how each independent variable affects the dependent variable.

This paper analyzes Ecuador's dependence on oil and its impact on economic growth, highlighting how, in the last 50 years, oil has been the country's primary source of income. Oil changed the perception of Ecuadorians as it became a resource that generated millions of dollars for the economy. However, wastefulness prevented prudent management of limited resources, causing unsustainable problems for the country.

Data and sources

The information was obtained from secondary sources, including the records of the Central Bank of Ecuador (BCE), the National Institute of Statistics and Census (INEC), and the World Bank.

Data analysis technique

The technique used in this study was observational, using time series data corresponding to the period from 2000 to 2020. Both formal and informal methods of statistical analysis were applied, focusing on the management of quantitative variables through specialized statistical programs.

Econometric methodology

Specification of the econometric model: In order to estimate the relationship between oil barrel exports and economic growth in Ecuador, as well as to measure the impact of the independent variables on economic growth, a multiple linear regression model was implemented. This model is based on the following functional form:

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + u_i \quad (1)$$

Where:

Y_i = dependent variable.

βx = regression parameters.

Xx = independent variables.

u_i = stochastic disturbance.

The equation for estimating the proposed econometric model is structured as follows:

$$Creci_{econ} = \beta_0 + \beta_1 \text{exporbarriilpetro}_t + \beta_2 \text{impderivados}_t + \beta_3 \text{preciobarriil}_t + \beta_4 \text{desempleo}_t + \beta_5 \text{IED}_t + u_i \quad (2)$$

Table 2.*Description of model variables.*

Variable	Description	Unit of measure	Source	Expected sign
Economic Growth	Economic growth is the expansion of a country's potential GDP or national production.	Monetary Value	Bank	N/A
Export of barrels of oil	Oil is the main export product and its revenues finance an important part of the government's accounts.	Monetary Value	World Bank	Positive
Imports of petroleum products	Imports are goods or services of foreign origin that importers bring into a country.	Monetary Value	Central Bank of Ecuador	Positive
Oil prices	It is the value or price of oil per barrel that is exported worldwide.	Monetary Value	Central Bank of Ecuador	Positive
Unemployment (EAP)	Unemployment rate is the number of unemployed represented as a percentage of the labor force.	Percentage	Central Bank of Ecuador	Negative
Foreign Investment	It is the transfer of foreign capital that a country receives from foreign economic entities.	Percentage	INEC	Positive

Estimation of the econometric model

The proposed multiple linear regression model was estimated using the ordinary least squares (OLS) method, an approach attributed to the German mathematician Carl Friedrich Gauss. This method is based on certain assumptions that give it outstanding statistical properties, making it a practical and popular tool for regression analysis (Gujarati & Porter, 2010). The resulting estimators, known as least squares estimators, are derived from the principle of minimizing the sum of squares of the errors. These properties are preserved under the OLS method, regardless of how the data were generated (Gujarati & Porter, 2010).

The adoption of a multiple linear regression approach, which includes several explanatory variables, enriches the model by using more information, leading to more precise estimates (Rojo, 2007). In the transition from simple to multiple regression, many of the principles related to the OLS estimator are maintained without significant changes. However, new elements specific to multiple regression are introduced, such as measures of fit for the model (Stock & Watson, 2012).

To assess the impact of oil barrel exports on economic growth (GDP), this study used two statistical software programs: Stata 2017 and E-Views 12. These programs facilitate the collection, analysis, and interpretation of the results, allowing for a detailed examination of the model assumptions.

Validation of the econometric model

Graphical methods and both informal and formal statistical tests were implemented to validate the proposed econometric model. These tests allow us to evaluate the suitability of the model and the reliability of the results obtained. The tests applied were as follows:

- **Multicollinearity:** The variance Inflation Value (VIF) and correlation tests between the regressor variables were used, complemented with scatter plots to identify linear relationships between them.
- **Heteroscedasticity:** To detect the presence of heteroscedasticity in the residuals, the Park test, the Glejser test, the White test, and the Breusch-Pagan test were applied.

- **Autocorrelation:** To examine the autocorrelation between the residuals, graphical methods, and statistical tests were used, including the Durbin-Watson test, an alternative Durbin-Watson method, and the Breusch-Godfrey test.

- **Normality:** Assessment of the normality of the distribution of the residuals was performed using graphical methods and statistical tests such as the Kolmogorov-Smirnov test, the Shapiro-Wilk test, and the Jarque-Bera test.

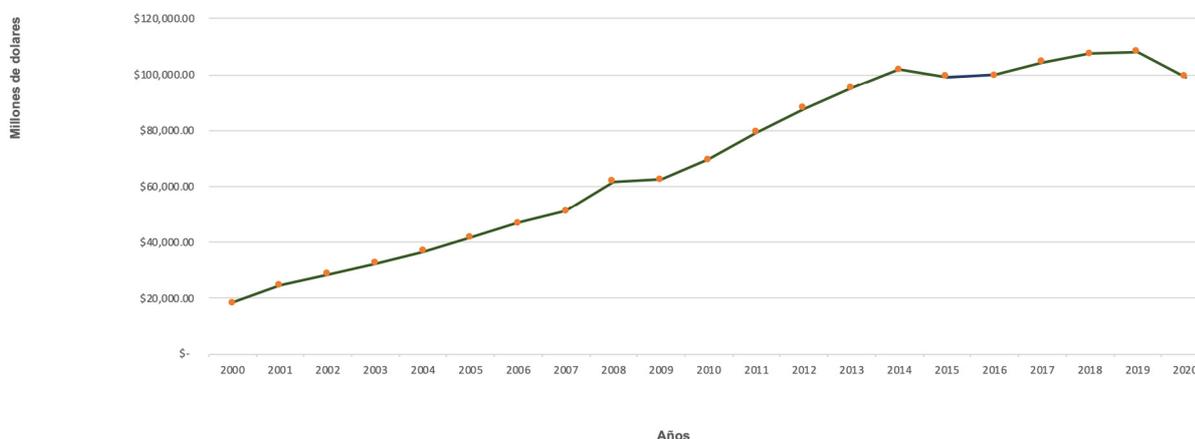
These tests are essential to ensure that the model complies with the basic assumptions of regression analysis, thus making it possible to obtain reliable and valid estimates of the relationships between the variables studied.

RESULTS AND DISCUSSION

This chapter considers the analysis and results obtained from this research study, considering the main objective of analyzing the impact of oil barrel exports on the economic growth of Ecuador. This section details the results obtained on the effect of oil exports on economic growth.

Ecuador's economic growth performance.

Figure 1.
Economic Growth of Ecuador



Source: (World Bank, 2022)

Over the last four years, Ecuador's Gross Domestic Product (GDP) averaged 70,253 million dollars in constant values. An increase was observed in 2017 of 1,641.63 million dollars, up 2.4% compared to 2016. However, in 2020, the Ecuadorian economy experienced a significant impact due to the COVID-19 pandemic, resulting in a contraction of 5,571 million dollars, representing a 7.8% decrease compared to 2019. This event not only marked the beginning of a global health crisis but also triggered profound economic hardship. According to Sanchez *et al.* (2020), the second quarter of 2020 was the period with the most significant economic affectation, evidencing a reduction of 2.3 billion dollars (12.8%) compared to the same quarter of the previous year and 1.918 billion dollars (10.9%) compared to the first quarter of 2020. This situation was mainly caused by the implementation of quarantines at the end of March of that year, together with several states of exception decreed by the government during this time, significantly affecting the production and commercialization of goods and services.

Consequences of Oil Dependence in Ecuador

As a consequence of the fall in oil prices in the 1980s, Ecuador faced severe economic imbalances. In fact, the Ecuadorian State was immersed in a deficit spiral, unable to increase its revenues at the same rate as its expenditures, which led to the budget deficit becoming a chronic problem. According to Fontaine (2002), between 1971 and 1980, Ecuador's fiscal revenues increased from 10.2% to 12.8% of GDP, while public expenditures grew from 13.3% to

14.2% of GDP. It was not until the 1989-1990 period that the State managed to reverse this trend, registering a budget surplus of 1.8% of GDP after fiscal revenues increased from 11.3% to 16.6% of GDP (between 1981 and 1990), and the proportion of public expenditures in GDP fell from 16.1% to 14.8%. However, by that time, it was too late: the external debt had exceeded 100% of GDP during the 1987-1991 period, reaching more than US\$10 billion.

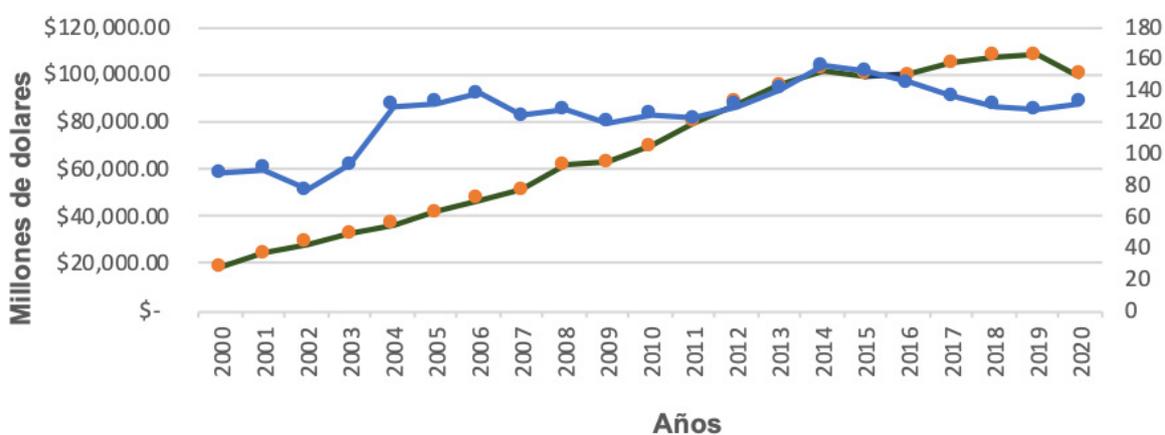
The policies implemented around oil activity have contributed significantly to the economic imbalances experienced by Ecuador during the 1980s and 1990s. The country's dependence on oil revenues, a non-renewable resource subject to highly volatile prices, has been a determining factor in Ecuador's economic instability. According to Chiriboga (2004), in the early 1980s, the inflation accumulated in the previous decade made it necessary to devalue the currency, which until then had been artificially fixed, thanks to indebtedness and high oil prices. Subsequently, the rate of devaluation exceeded inflation, contributing to its increase. During the period analyzed, inflation always exceeded double digits, reaching an average of over 30%.

In addition, dependence on oil implies higher expenses for Ecuador since this resource is subsidized to allow its acquisition and consumption by the population. This dependence not only fosters economic instability but also, since oil is a finite resource, raises the urgency of reducing dependence on crude oil. Molina (2020)

points out that since 2003, the increase in the consumption of liquefied petroleum gas is due to a reduction in the local production of petroleum derivatives to 20%, which led to importing 80% of these derivatives to meet domestic demand. This dynamic contrasts with previous periods in which the proportion was 60% imported versus 40% local production. Between 2000 and 2019, the volume of imports of oil derivatives exceeded that of crude oil exports, exacerbating the

country's economic crisis due to the outflow of foreign currency, which prevented the generation of domestic savings. Despite efforts to increase crude oil exports, price fluctuations negatively affect the economy, preventing improvements in the trade balance. Thus, when export prices rise, the country is unable to sell on a large scale. When they fall, it is forced to export more in order to obtain acceptable income without achieving a positive impact on its economy.

Figure 2.
Behavior and evolution of oil exports on economic growth



Source: (World Bank)

Oil has become the most significant resource for Ecuador, generating billions of dollars annually through its sale and acquisition. During the second oil boom, the relationship between economic growth and crude oil exports intensified, resulting in a fall in the price of oil, affecting the economy more profoundly than in the past. According to Sabando (2021), at the close of 2020, Ecuador exported a total of 131.5 million barrels, marking an increase of 4.3 million barrels compared to the previous year. Of this total, public companies were responsible for exporting 115.6 million barrels, equivalent to 87.9%, while private companies exported 15.9 million barrels, representing 12.1%. This data reveals that, over the last three years, exports by public companies have experienced a gradual increase, in contrast to the continuous decrease in exports by private companies.

Effect of oil barrel exports on economic growth

Oil exports have had a positive impact on Ecuador's economic growth, with crude oil being the main export product since the first oil boom in

1972. This resource is one of the pillars of the national economy, although its production faces limitations because it is a finite resource. Oil has increased global demand, mainly benefiting the industrialized countries that consume this resource, which highlights the importance of Ecuadorian crude oil being recognized and demanded internationally.

According to Zapata and Vera (2020), the Ecuadorian economy is highly dependent on oil exports, which constitute a significant source of foreign exchange. However, the price of a barrel of oil is inherently volatile and subject to fluctuations due to global market dynamics. This volatility is reflected in the preparation of the General State Budget (PGE), where oil revenues are taken into account by projecting an average price per barrel for the current fiscal year. This practice, although necessary, introduces an element of uncertainty in economic planning since price volatility can significantly deviate actual revenues from budget estimates, forcing one to consider a margin of risk in fiscal management.

Policies that would help to solve oil dependence in Ecuador

Your analysis of strategic policies to diversify the Ecuadorian economy and promote sustainable development is very coherent and relevant. To improve the fluency and clarity of your proposal, here is a revised version:

“Incentivizing non-oil exports is a crucial policy for Ecuador, given its heavy dependence on oil. Encouraging the export of products such as bananas, shrimp, cocoa, tuna, and coffee would not only increase profitability and production but also generate employment and economic development. This strategy would diversify the country’s economic base, opening up more opportunities to compete globally.

Investment in technology is another fundamental policy for the country’s progress. Technology is a crucial driver of economic growth, as companies require technological innovations to offer quality services. In addition, the development of applications and other technological advances can generate significant revenues, contributing to economic development and social progress.

Reducing taxes on private companies that export could increase their productivity by demanding more labor, which is crucial to addressing unemployment. This measure could also raise the level of exports and improve the quality of life of the population.

Finally, investment in education is essential. Quality education not only creates a more prosperous and competitive system but also helps to form responsible citizens capable of contributing to the care of the environment and reducing dependence on non-renewable resources. Education is critical to reducing inequality and offering new opportunities to all sectors of society.

Results of the estimation of the econometric model

Estimated equation

growth = 0.0511 + 0.0278 expbarrel-oil + 0.2448 derivatives + 0.1594 price-oil + 0.8254 unemployment + 0.00742 FDI.

Table 2

General results of the multiple linear regression model.

Variables	Coefficients
d2 dlexportbarrelpetro	0.105** (0.046)
d1 dlimporderivatives	0.217** (0.072)
d1 dlpricebarrel	0.140*** (0.038)
d1 dldeemployment	0.030 (0.033)
d2 dlid	0.011 (0.012)
Constant	0.042*** (0.010)
Observations	19
Prob > F	0.0001
R-squared	0.825

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The model presents an overall statistical significance of 1%, which indicates its relevance in explaining the dependent variable. In addition, the adjusted R-squared shows that 82.56% of the variability in the dependent variable can be explained by the independent variables included in the model.

Within the model, it is found that the variable corresponding to exports of oil barrels, imports of oil derivatives, and the price per barrel of oil have a statistical significance of 5%. This suggests that these variables have a significant impact on economic growth.

The β_0 is statistically significant at 5% since the P-value 0.002 is less than the significance level.

Table 3
Validation of the Gaussian-Markov assumptions.

Assumptions	Test or test	Result	Conclusion
Multicollinearity	High correlation between regressors. Graphical method. VIF test	There is no high correlation between regressors.	The variables do not present multicollinearity, therefore the assumption is validated.
Heteroscedasticity	Graphic method. Breusch-pagan test. White's test	The independent variables have a VIF value=1.66 less than 10.	Heteroscedasticity is present. Heteroscedasticity was corrected with generalized linear models (glm).
Autocorrelation	Durbin-Watson statistic. Durbin-Watson alternative Breusch-Godfrey test	Durbin-Watson d-estadístico (6, 19) = 1.5400 Prob > chi2 = 0.4833 Prob > chi2 = 0.3873	Autocorrelation is present. Corrected with the (prais) command.
Normality	Shapiro-Wilk test. Shapiro test France Jarque-Bera test	P-value = 0.072 P-value = 0.0393 Jarque-Bera= 0.4311	Errors do not have a normal distribution The assumption is violated
Specification bias	Ramsey test	Prob > F = 0.6908 $H_0 = Si P \geq \text{Alpha} = 0.05.$ The model has no omitted variables. $H_1 = Si P < \text{Alpha} = 0.05.$ The model has omitted variables	The model has no omitted variables

Exports of barrels of oil

The variable of oil barrel exports in Ecuador is statistically significant, indicating that a 1% increase in these exports is associated with an average increase of 0.10% in the country's economic growth. This finding is supported by Cando's (2022) study, which highlights a significant relationship between oil exports, gross fixed capital formation, and GDP, concluding that exports have a direct impact on Ecuador's economic growth, both in the short and long term. On the other hand, the research by Restrepo *et al.* (2020) analyzes the impact of fuel exports on the exchange rate, the tradable sector of the economy, and the economic growth rate of Colombia during the period 1960-2016. The results of this study suggest a negative effect of fuel exports on the Colombian economy. In addition, the possibility that economic openness processes produced effects similar to those of Dutch disease was examined, but no evidence was found in this regard.

Imports of derivatives

The importance of derivative imports for Ecuador's economic growth is statistically significant, indicating that a 1% increase in these imports is expected to result in an average 0.21% increase in economic growth. This finding is paralleled by the work of Gómez-Sánchez and Salazar-Villano (2015), who identify a stable long-run relationship between total imports, the exchange rate, and GDP in the Pacific region of Colombia. In addition, they highlight the positive impact of economic liberalization processes on imports. They suggest that policies should focus on fostering production growth through institutional arrangements, exchange rate regulation, risk management, and increased free trade agreements. On the other hand, the study by Lema and Grandes (2020) concludes that imports of derivatives have a positive correlation with economic growth, primarily through investment and international trade.

Furthermore, they point out that this relationship is concave in developed countries, indicating variations in the impact of derivatives according to the country's level of development. These studies support the results obtained in our model, suggesting that imports of derivatives contribute to the profitability of the Ecuadorian economy. This contribution is due both to the increase in input prices and to a growing demand from industries. In this way, it is evident that imports

not only satisfy immediate needs but also play a crucial role in the dynamism and economic growth of the country.

Price per barrel of oil

The statistics show that a 1% increase in the price per barrel of oil in Ecuador is associated with an average increase of 0.14% in economic growth. This finding is supported by the research of Iza Torres (2022), which highlights how oil price fluctuations have divergent impacts between oil-exporting and importing countries. While importers may face economic challenges in the face of a price increase, exporters, such as Ecuador, tend to benefit from higher revenues from the sale of crude oil. However, inefficient management of these resources can lead to economic problems. In addition, Saucedo & Gonzales' (2018) study on Mexico indicates that variations in oil prices positively impact the manufacturing industry and reveals that changes in public spending directly influence the mining sector, concluding that sectors more linked to foreign trade are more susceptible to oil price shocks.

On the other hand, Alonso & Martínez Quintero (2017) examine the case of Chile, a net oil importer, and find that an oil price shock can generate an unexpected increase in GDP, an outcome contrary to conventional theory. For net exporters such as Mexico and Colombia, an unexpected increase in oil prices has a positive effect on GDP. However, the duration and magnitude of this effect vary between the two countries. These studies demonstrate the complexity of coordinating economic policies among American Petroleum Institute (API) member countries in the face of heterogeneous responses to oil price shocks. The results obtained in this model confirm that an increase in oil prices leads to an increase in revenues for the Ecuadorian economy, underscoring the importance of prudent management of these resources to maximize their contribution to economic growth.

Unemployment (EAP)

The unemployment variable has not been shown to be statistically significant at any level of significance in this model, indicating that it does not have a direct effect on economic growth. This finding aligns with the research of Hilario *et al.* (2022), whose results suggest a low degree of negative correlation between structural and

frictional unemployment and economic growth in Peru. This study highlights that applying Okun's approach does not produce consistent results across different economies, especially when compared to developed economies. Furthermore, when discussing and reflecting on these findings in the Peruvian context, variability in the effects of unemployment on economic growth is observed across different economic periods. On the other hand, the study by Mellizo Idrobo (2019) identifies a dual causality relationship between GDP and unemployment, evidencing that both GDP affects unemployment and unemployment influences the level of economic activity, in addition to being affected by its historical dynamics. These analyses confirm that the relationship between unemployment and economic growth is complex and suggests a negative effect on economic growth when the unemployment rate is high. Taken together, these studies highlight the importance of considering the specific dynamics of each economy when analyzing the impact of unemployment on economic growth and reveal that a high unemployment rate could be associated with insufficient economic growth.

Foreign Direct Investment

Although the Foreign Direct Investment (FDI) variable was not shown to be statistically significant in our model and, therefore, does not affect economic growth in Ecuador, previous studies suggest a different impact in other Latin American contexts. According to Alvarez Herranz *et al.* (2009), in their analysis of Latin American countries, FDI fosters both private capital accumulation per capita and capita income growth. They also point out that the quality of institutions, especially the protection of private property and individual freedom, plays a crucial role in promoting growth. They also point out that public investment also contributes to economic growth and that the countries studied tend toward conditional convergence, which is in line with the existing literature. On the other hand, the study by Suanes and Sagales (2015) confirms the positive impact of FDI on economic growth and highlights significant nonlinear effects on income inequality. Although FDI may initially increase inequality above certain levels (as a percentage of GDP), it contributes to greater equity. These findings contrast with the results obtained in our model for Ecuador, suggesting that FDI has no appreciable effect on the country's GDP. This contrast could be explained by the economic growth deficit in Ecuador, potentially due to its

dependence on the oil sector, which could deter foreign direct investment. Thus, while evidence from other Latin American studies points to a beneficial role of FDI in economic growth and equity, the case of Ecuador shows that the specific context and economic challenges can significantly influence the effectiveness of FDI as an engine of growth.

CONCLUSIONS

This study has explored the deep dependence of the Ecuadorian economy on the oil sector, highlighting how oil barrel exports contribute significantly to economic growth. Through a rigorous quantitative analysis employing an econometric model based on the Ordinary Least Squares (OLS) approach and time series data, it has been shown that oil exports have a positive impact on Ecuador's economic growth. This reaffirms the centrality of oil as an economic pillar of the country despite fluctuations in international prices and the challenges inherent to dependence on a finite resource.

However, the study has also revealed that other variables considered critical, such as Foreign Direct Investment (FDI) and the unemployment rate, are not statistically significant in their relationship with economic growth in the Ecuadorian context. This suggests that the economic structure of the country and its development are not only influenced by the dynamism of the oil sector but also by other complex factors that may include government policies, global macroeconomic conditions, and the quality of institutions and human capital.

Finally, the research underscores the urgency of diversifying the Ecuadorian economy beyond oil into sectors that promote sustainable and equitable development. Although oil will remain a crucial element in the short to medium term, it is imperative to explore and strengthen other areas of the economy that can make a sustained contribution to the country's well-being and progress. This study provides an essential foundation for future research that seeks to understand more deeply and broadly the challenges and opportunities for economic growth in Ecuador.

Recommendations

Given the significant impact of oil exports on the Ecuadorian economy and the non-significance of variables such as FDI and unemployment on economic growth, it is recommended that policies focused on economic diversification be implemented. It is also crucial to encourage non-oil sectors, such as agriculture, tourism, and technology, which can generate alternative sources of income and employment. Improving the quality of institutions and promoting a favorable environment for foreign direct investment can also attract resources to foster the development of critical infrastructure and innovation.

Contribution to knowledge

This study adds to existing knowledge by providing a detailed analysis of how dependence on the oil sector affects economic growth in Ecuador, using an econometric model to assess the relationship between oil exports and other economic factors. It offers valuable insights into the dynamics between the oil sector and economic development in a country highly dependent on this natural resource, contributing to the literature on resource-based economies and their long-term sustainability.

Limitations of the study

A limitation of this study is its focus on a specific period, which, while providing valuable insights, may only partially capture the long-term dynamics of the Ecuadorian economy and its relationship with the oil sector. Moreover, the non-significance of variables such as FDI and unemployment suggests the need to explore other factors that may influence economic growth, such as specific government policies, changes in the global economic context, and variations in the quality of the country's economic institutions. Future research could broaden the scope of the study to include a more detailed analysis of these aspects.

Author contributions

Jorge Luis Bernal Yamuca: Conceptualization, Data Curation, Formal Analysis, Research, Methodology, Project Management, Supervision, Validation, Writing - original draft, Writing: proofreading and editing

Fernando Antonio Molina Argudo: Conceptualization, Formal Analysis, Research, Methodology, Validation, Visualization, Writing - original draft, Writing: proofreading & editing

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Alex Adrián Zamora Rizzo: Conceptualization, Research, Methodology, Writing - original draft, Writing: proofreading and editing

Ximena Nicole Sánchez Toala: Research, Methodology, Writing - original draft, Writing: proofreading and editing

Conflicts of interest

The author declares that there are no conflicts of interest.

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