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Determinants of economic growth in Honduras: Regression analysis

Roldan Villela[1+]
Juan Jacobo Paredes[2]

[1,2]*Faculty of Graduate, Central American Technological University, Tegucigalpa 11101, Honduras.*
[1]*Email: roldan.villela@unitec.edu*
[2]*Email: jacobo.paredesheller@unitec.edu*

(+ Corresponding author)

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ABSTRACT

This research aims to evaluate the relationship between various determinants of economic growth and real GDP in Honduras from 1990 to 2020. Using regression analysis across four groups (models) of determinants, this study employs time series data extracted from World Bank online databases. The first model, focused on economic sectors comprising GDP according to the value-added method, reveals that industry, services, and agriculture have a positive and significant relationship with real GDP. The second model, covering key determinants, indicates that only infrastructure and labor force show a positive and significant relation with economic growth. The third model, focusing on education, shows a positive and significant correlation between tertiary school enrollment and real GDP, while primary school enrollment exhibits a negative and significant correlation with economic growth. The fourth model encompasses non-economic determinants, with findings revealing that Voice and Accountability, Political Stability, and Rule of Law have a negative and significant relationship with economic development, whereas Government Effectiveness and Control of Corruption are positively and significantly associated with economic growth. Overall, most determinants prove inconsequential or show a negative relationship with economic growth. The findings highlight the complexity of fostering economic growth in Honduras, where traditional growth factors like education and governance show varied effects. Strategic investments in tertiary education, infrastructure, and institutional effectiveness could drive positive outcomes. These insights suggest that growth strategies in Honduras and similar contexts require targeted, multifaceted approaches.

Contribution/Originality: This article highlights important gaps in the applicability of economic growth determinants, particularly in developing countries such as Honduras. Although theoretical models are valid, they often do not address practical realities, suggesting that determinants identified in advanced economies may not be relevant in developing contexts.

1. INTRODUCTION

Economic growth and its determinants have been subjects widely discussed by economists; for politics and economic theory, this has been a very notorious topic for decades. There is a wide debate regarding the economic models and policies that developing countries should implement to achieve levels of well-being similar to those of rich countries. Researchers such as Aghion and Howitt (1992); Barro (1996); Rebelo (1991) and Romer (1990) are the ones who created the bases around this topic, evidencing variations in their own approaches. Honduras faces multiple conflicts in the educational, social, economic, political, and environmental sectors, all of which manifest and reinforce

one another. Inadequate economic growth that has had a minimal impact on reducing inequalities and poverty. Public finances exhibit a high degree of informality and imbalance. The rule of law has systematically weakened over the last 30 years, with the recurring governance crises affecting the population and undermining the state's ability to respond to growing social demands (PNUD, 2021).

In 2020, Honduras' real GDP was US$22.18 billion, the second lowest in Latin America, surpassing only Nicaragua (World Bank, 2022c). In the same year, its GDP per capita recorded US$2,239, also making it the country with the second lowest per capita income in the region (World Bank, 2022d). For its part, the human capital index was 0.48 according to World Bank (2022e) surpassing only Guatemala. While its Human Development Index (HDI) is 0.621, which ranks 137th among 191 countries. It holds the lowest position in Central America (UNDP, 2022). In addition, the Corruption Perceptions Index (CPI) gives it a score of 24 and ranks it 157th out of 180 countries (Transparency International, 2022). These indicators, along with others, contribute to Honduras' low production and income, poor productivity and human development, and widespread corruption.

This study contributes to the literature by providing a comprehensive analysis that incorporates different groups of determinants into a single regression framework. This study addresses a topic that has not received sufficient attention in the national context to date. This approach offers a more comprehensive perspective on the country's economic development. Highlighting the interaction of both economic and non-economic variables, which allows for a better understanding of the factors that drive development.

This study aims to place the importance of the determinants of economic growth on the government agenda, exposing the relevance that this information offers to the State. This is to enable the State to make decisions that aim to increase production through investments and sound public policies. The results of this study provide empirical evidence also to international cooperation and academics who could consider the results obtained from this research or continue with similar research. In this context, the objective of this study is to evaluate the relationship between the determinants of economic growth and real GDP in Honduras between 1990 and 2020.

2. LITERATURE REVIEW

This section will discuss some of the most recent research related to the determinants of economic growth. In Ghana, Ho and Iyke (2020) investigated the effects of the determinants of economic growth. Using a Solow economic growth model augmented over the period 1975 to 2014. Their results reveal that in the short run, government spending and foreign aid have a positive effect on growth. While in the long run, human capital and foreign aid positively favor production. In turn, Sharma, Kautish, and Kumar (2018) using an autoregressive distributed lag (ARDL) model, examine the effects of selected determinants on economic growth in India. The period of analysis is from 1971 to 2016. In the long run, their findings reflect that foreign aid, government final consumption expenditure, and foreign direct investment positively and significantly influence economic growth. Meanwhile, exchange rate and human capital do so negatively. Basuki, Purwaningsih, Soesilo, and Mulyanto (2020) used a dynamic panel regression model to analyze the effect of determinants on economic growth in Indonesia. The analysis period was from 2008 to 2017. The results of their research show that in the short run, population negatively affects economic growth. While in the long run, growth is affected by the number of people, the poor, health budget, and foreign investment.

On the other hand, Pegkas (2018) explored through the vector autoregression (VAR) and autoregressive distributed lag (ARDL) methods during the period 1970 to 2016 the relationship between economic growth and several factors in Greece. The results indicate that in the long run, government and private consumption, investment, and trade openness positively affect economic growth. On the contrary, public debt and population growth impact it negatively. Likewise, Am Marcel (2019) conducted a study on the determinants of economic growth in Benin during the years 1970 to 2017. He utilized time series and implemented the ordinary least squares technique. The findings demonstrate that foreign direct investment and the consumer price index have positive and significant impacts on growth. In contrast, trade openness and government spending have significant but negative effects. Moreover,

Waheed and David (2021) analyze the impact of various determinants of economic growth in Pakistan. Employing the cointegration method ARDL over a period from 1977 to 2019. The results obtained indicate that capital, inflation, exchange rate, and tax revenue have a significant relationship with economic growth in both long run and short run.

Meanwhile, Gumede and Bila (2022) explore the impact of key drivers of the South African economy over the period 1980 to 2019. To test the long-run relationship, they use the ARDL and vector error correction (VEC) methods. The main outcomes reveal that consumption, exports, and investment are the most important determinants of economic growth in South Africa. Mose (2021) empirically examines the determinants of economic growth in 47 counties in Kenya. The research span was from 2014 to 2017. Through the ARDL method, he identifies that in the long run, public investment, government consumption, electricity infrastructure, and quality of governance and institutions are the main determinants of economic growth. Short term growth is primarily determined by human capital and budget utilization. Furthermore, Sitorus (2022) analyzed the effect of various determinants of economic growth in 4 ASEAN member countries (Brunei Darussalam, Indonesia, Malaysia, and Singapore). Utilizing panel data regression analysis method between 2010 to 2019. It finds that exports, tourist visits, literacy rate, and life expectancy negatively affect economic growth in these countries. Only imports affect it positively.

Whereas, Rofiqoh (2022) performs an analysis on the determinants of economic growth in China. Using time series from 1980 to 2020 and multiple regression with the ordinary least squares (OLS) method as a tool of analysis. The conclusions reveal that the unemployment rate has a negative and significant effect on economic growth. By contrast, industry and the level of exports are positively and significantly associated with growth.

Despite the extensive literature on the determinants of economic growth, there remains a significant gap in its applicability. This is particularly true for developing nations like Honduras. Despite their validity, theoretical models often fail to translate into practical realities due to the varying levels of development across nations. This suggests that determinants identified in advanced economies may lack relevance in contexts where local and socioeconomic factors are crucial.

The existing literature review reveals a lack of consensus among researchers regarding the variables to include in studies and their impact on economic growth. This variation is largely influenced by the circumstances of each region or country. Given the paucity of published data on Central American nations such as Honduras, it is key to undertake a study covering economic growth in the region. It is crucial to undertake a study that encompasses a diverse range of economic and non-economic factors that affect growth.

3. METHODOLOGY

This study uses regression equations that take an aggregate approach to four determinant groups of economic growth to test the effects on real GDP in Honduras. Regression models fall into the group of the most popular statistical methods in the social sciences (Hutcheson & Sofroniou, 1999). Regression models attempt to define the behavior of the response variables as a function of several regressors. This model makes it possible to treat each of the equations independently of each other as a univariate linear regression (Ganesh, 2010). Barro (1996) widely uses this method. There are studies that have developed several models of determinants of economic growth with similar characteristics to those used in this research (Majumder, 2022; Prochniak, 2011; Sissoko & Sloboda, 2020; Vedia-Jerez & Chasco, 2016).

The choice of regression model is based on its ability to capture various dimensions of economic growth in an accurate and relevant way. Theory and empirical evidence support the employed regressors. The use of linear regression is particularly appropriate in this study. It enables the simultaneous analysis of a wide range of variables. This is crucial to capture the multiple forces that influence real GDP in Honduras. It offers interpretative clarity, making it suitable for time series analysis. The research developed four models.

The first model (Model 1) refers to the relationship that economic sectors have with the real gross domestic product, which is expressed as follows:

$$GDP = f(Services, Agriculture, Industry) \quad (1)$$

Natural logarithm is used on both sides of the model, so the equation is expressed econometrically as follows.

$$Ln(Real\ GDP) = \alpha_0 + \alpha_1 Ln(Ser) + \alpha_2 Ln(Agr) + \alpha_3 Ln(Ind) + \mu \quad (2)$$

This research uses real GDP as a proxy for economic growth. According to the value-added method, GDP is decomposed to establish correlations with respect to sector services (Ser), agriculture (Agr), and industry (Ind). For the three economic sectors as well as the real GDP, a period of analysis from 1990 to 2020 is used. This model expresses the variables at constant 2015 US$ prices. The time series used were extracted from the World Bank's online databases. This model was used in studies conducted by Ahmad, Iqbal, and Mehmood (2016); Rahman, Rahman, and Hai-Bing (2011) and Uddin (2015). Table 1 shows the variables used with their respective sources, links, and definitions in model 1.

Table 1. Variables definitions and sources (Model 1).

Variables	Definition	Source
Gross domestic product (GDP)	Sum of gross value added of all resident producers in the economy.	World bank
Services (Ser)	Services include value-added trade, hotels, restaurants, transportation, government, financial, professional and personal services, such as education, healthcare and real estate services.	World bank
Agriculture (Agr)	It includes agriculture, forestry, fishing, hunting, as well as crops and livestock. Value added is the net production after adding all outputs and subtracting intermediate inputs.	World bank
Industry (Ind)	It is composed of value added from manufacturing, mining, construction, electricity, water and gas.	World bank

The second model (Model 2) refers to the determinants of economic growth identified as key in the literature and their contribution to real gross domestic product, which is expressed as follows:

$$GDP = f(Capital, Labor\ Forces, Exports,\ Imports, Infraestructure, Total\ Reserve, Investmet, Trade) \quad (3)$$

Natural logarithm is used on both sides of the model, so the equation is expressed econometrically as follows:

$$Ln(Real\ GDP) = \beta_0 + \beta_1 Ln(Cap) + \beta_2 Ln(LF) + \beta_3 Ln(\ Exp) + \beta_4 Ln(Imp) + \beta_5 Ln(Inf) + \beta_6 Ln(TR) + \beta_7 Ln(Inv) + \beta_8 Ln(Tra) + \mu \quad (4)$$

Real GDP continues to be used as a proxy variable for economic growth. Capital (Cap) is expressed by broad money, % GDP, for labor force (LF), the population between 15 and 64 years old is used; infrastructure (Inf) is measured by telephone lines per 100 people, as did (Sahin, Can, & Demirbas, 2014). Exports (Exp) and imports (Imp) of goods and services are denoted as a % of GDP, as is trade (Tra) and also investment (Inv), for which gross fixed capital formation is used. Total reserves (TR) are presented at current prices in US$. The period of analysis is from 1990 to 2020. The time series used were extracted from the World Bank's online databases. Equivalent and similar models were performed in the studies of Batrancea, Rathnaswamy, and Batrancea (2021); Oyebowale and Algarhi (2020) and Ramanayake and Lee (2015). Table 2 presents the variables used with their respective sources, links, and definitions in model 2.

Table 2. Variables definitions and sources (Model 2).

Variables	Definition	Source
Capital (Cap)	Sum of cash outside banks; demand deposits other than those of the central government; time, savings, and foreign currency deposits of resident sectors other than the central government.	World bank
Labor force (LF)	Total population between the ages of 15 to 64 as a percentage of the total population.	World bank
Infrastructure (Inf)	Fixed telephone subscriptions refer to the sum of the active number of analog fixed telephone lines, voice subscriptions, fixed wireless local loop subscriptions, and fixed public payphones.	World bank

Variables	Definition	Source
Exports (Exp)	Represents the value of all goods and other market services supplied to the rest of the world.	World bank
Imports (Imp)	Imports of goods and services represent the value of all goods and other market services received from the rest of the world.	World bank
Trade (Tra)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World bank
Investment (Inv)	Includes land improvements, acquisition of plant, machinery, and equipment, construction of roads, railroads, and the like; including schools, offices, hospitals, housing, and commercial and industrial buildings.	World bank
Total reserves (TR)	Total reserves comprise holdings of monetary gold, special drawing rights, IMF members' reserves held by the IMF, and foreign exchange holdings under the control of the monetary authorities.	World bank

The third model (Model 3) examines how education and education-related investments affect the real gross domestic product, as stated below:

$$GDP = f(School\ enrollment, preprimary, School\ enrollment, primary, School\ enrollment, secondary, School\ enrollment, tertiary, Government\ expenditure\ on\ education) \quad (5)$$

Natural logarithm is used on both sides of the model, so the equation is expressed econometrically as follows:

$$Ln(Real\ GDP) = \gamma_0 + \gamma_1 Ln(Schoolpre) + \gamma_2 Ln(Schoolpri) + \gamma_3 Ln(Schoolsec) + \gamma_4 Ln(Schoolte) + \gamma_5 Ln(Govedu) + \mu \quad (6)$$

To understand the effect of education-related variables on economic growth (real GDP), school enrollment rates (gross %) at all educational levels, preprimary (Schoolpre), primary (Schoolpri), secondary (Schoolsec), and tertiary (Schoolter) are included in this model, and government expenditure on education % GDP (Govedu) is also included in the analysis. The evaluation period of this model is from 1990 to 2020. Annual time series were obtained from the World Bank's online databases. Several authors have done similar research, among them (Adelakun, 2011; Barro, 1991; Ochilov, 2012). Table 3 presents the variables used with their respective sources, links, and definitions in model 3.

Table 3. Variables definitions and sources (Model 3).

Variables	Definition	Source
School enrollment preprimary (Schoolpre)	Ratio of total schooling, regardless of age, to the population of the age group that officially corresponds to the level of education indicated. Preschool education refers to programs in the initial stage of organized instruction.	World bank
School enrollment primary (Schoolpri)	Primary education provides children with basic skills in reading, writing, and mathematics, along with an elementary understanding of other subjects.	World bank
School enrollment secondary (Schoolsec)	Secondary education aims to lay the foundation for lifelong learning and human development by offering more subject- or skill-oriented instruction using more specialized teachers.	Calculated by the authors based on world bank and ministry of education.
School enrollment tertiary (Schoolter)	Tertiary education, whether for an advanced research degree or not, normally requires, as a minimum condition for admission, successful completion of education at the secondary level.	World bank
Government expenditure on education (Govedu)	General government expenditure on education (Current, capital, and transfers) is expressed as a percentage of GDP.	Calculated by the authors based on world bank and ministry of education.

The fourth model (Model 4) evaluates the relationship of non-economic determinants on real gross domestic product, which is expressed as follows:

$$GDP = f(Voice\ and\ Accountability, Political\ Stability, Government\ Effectiveness, Regulatory\ Quality, Control\ of\ Corruption,\ Rule\ of\ Law) \quad (7)$$

Natural logarithm is used on both sides of the model, so the equation is expressed econometrically as follows:

$$Ln(Real\ GDP) = \delta_0 + \delta_1 Ln(VA) + \delta_2 Ln(PS) + \delta_3 Ln(GE) + \delta_4 Ln(RQ) + \delta_5 Ln(CC) + \delta_6 Ln(RL) + \mu \quad (8)$$

This model makes it possible to evaluate the correlation between non-economic determinants and real gross domestic product (real GDP), using the 6 dimensions developed by the Worldwide Governance Indicators (WGI). The analysis covers the period from 1996 to 2020 as a result of data availability. Moshiri and Hayati (2017); Radulović (2020) and Xu et al. (2021) also used models equal to the one used in this research. Table 4 presents the variables used with their respective sources, links, and definitions in model 4.

Table 4. Variables definitions and sources (Model 4).

Variables	Definition	Source
Voice and accountability (VA)	It reflects the perception of the degree to which a country's citizens can participate in the election of their government, as well as freedom of expression, freedom of association, and freedom of the media.	World bank
Political stability (PS)	Measures the perception of the likelihood of political instability and/Or politically motivated violence, including terrorism.	World bank
Government effectiveness (GE)	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	World bank
Regulatory quality (RQ)	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	World bank
Control of corruption (CC)	Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption.	World bank
Rule of law (RL)	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts.	World bank

4. RESULTS

Table 5 displays the results from the four regressions for each model. With R-squared values exceeding 0.9, we confirm the robustness and suitability of the models, allowing us to interpret the coefficients.

Table 5. Regression results, coefficients.

Variables	Model-1	Model-2	Model-3	Model-4
Dependent variable: Real GPD	-	-	-	-
Services (Ser)	0.383**	-	-	-
Agriculture (Agr)	0.188**	-	-	-
Industry (Ind)	0.360**	-	-	-
Capital (Cap)	-	0.024	-	-
Labor forces (LF)	-	4.029**	-	-
Exports (Exp)	-	0.963	-	-
Imports (Imp)	-	1.614	-	-
Infrastructure (Inf)	-	0.102**	-	-
Total reserve (TR)	-	-0.027	-	-
Investment (Inv)	-	-0.020	-	-
Trade (Tra)	-	-2.391	-	-
School enrollment preprimary (Schoolpre)	-	-	0.161	-
School enrollment primary (Schoolpri)	-	-	-1.185**	-
School enrollment secondary (Schoolsec)	-	-	-0.030	-

Variables	Model-1	Model-2	Model-3	Model-4
School enrollment tertiary (Schoolter)	-	-	0.556**	-
Government expenditure on education (Govedu)	-	-	0.080	-
Voice and accountability (VA)	-	-	-	-0.720**
Political stability (PS)	-	-	-	-0.425**
Government effectiveness (GE)	-	-	-	0.269**
Regulatory quality (RQ)	-	-	-	0.116
Control of corruption (CC)	-	-	-	0.389**
Rule of law (RL)	-	-	-	-0.362**
Observations	31	31	31	22
R-squared	0.999	0.996	0.985	0.958

Note: **p < 0.05.

The first model (Model 1) analyzes the relationship between economic sectors and real GDP. It is confirmed that the three sectors are decisive in economic growth since there is a correlation. In Honduras, the tertiary sector accounted for 57% of aggregate production in 2020 (World Bank, 2022h). This percentage is well below the average for Latin America and the Caribbean (68%). The Services (Ser) with a coefficient of .383 (p-value = 0.00) is correlated with economic growth. This aspect is crucial because Services sector possesses a significant amount of human capital, which, through increased productivity, enhances economic growth (Jola, 2013). This result is consistent with the findings of Tufaner (2021) in Turkey and Chihana and Kunda (2017) in Zambia. The direction of state resources and policies dedicated to fostering this sector is questionable. The government has historically targeted and prioritized the primary and secondary sectors to the detriment of services.

With respect to the agriculture sector (Agr) with a coefficient of .188 (p-value = 0.00), there is evidence of a correlation with economic growth. This coincides with the results found by Bashir et al. (2019) in Indonesia and Khan, Jamshed, and Fatima (2020) in West Bengal (India). This sector stands out (constant prices) for being the third most important economic activity in the country, below manufacturing industries and financial intermediation (Banco Central, 2022a). However, even though the government prioritizes this sector in terms of public policies and budget allocation, its performance and impact on the economy may fall short of expectations.

The secondary sector is the second largest contributor to gross domestic product (World Bank, 2022f). The value-added industry (Ind), with a coefficient of .360 (p-value = 0.00) is related to economic growth. The studies conducted by Abbasi, Shahbaz, Jiao, and Tufail (2021) in Pakistan align with these results. Two sub-activities associated with the industry (constant prices), Food Products, and Manufacture of Textile Products according to the national accounts reported by the Banco Central (2022b) are particularly highlighted. The State should encourage the strengthening of the industrial sector, albeit in more specialized and sophisticated sub-activities. In this way, it could generate conditions that facilitate a gradual and sophisticated shift towards the service sector (Dossani, 2018).

Model 1 shows that, although productive sectors have a positive relationship with growth. Their effects are considerably smaller than traditional theory suggests. In developing economies, the literature often emphasizes the importance of the industrial and service sectors as key drivers of economic growth. However, the results indicate that neither sector has the expected significant impact. This suggests that other structural or institutional factors may be limiting their contribution to growth.

The research examines the second model (Model 2), which focuses on the key economic growth determinants identified by the economic literature. In general, the picture is discouraging; only two variables out of eight evaluated are correlated with real gross domestic product. Capital (Cap) with a coefficient of .024 (p-value = 0.752) has no statistical relationship with economic growth. This result is consistent with the studies conducted by Tegegne (2021) and Razia and Omarya (2022) who found no long-term relationship between these variables in Ethiopia and Palestine, respectively.

In Honduras, there is a strong positive correlation between the labor force (LF) and economic growth. The labor force (LF) is highly positively correlated with economic growth in Honduras. The coefficient of 4.029 (p-value =

0.00), reflects the importance of employment in aggregate production on real GDP. Researchers Soava, Mehedintu, Sterpu, and Raduteanu (2020) in European Union countries and Cung and Hung (2020) in Vietnam found similar results. Although this association is strong and flattering, the influence of the migrant population on the national economy must be considered.

Regarding exports (Exp) and imports (Imp), the vast majority of studies show that both are crucial to achieving economic growth (Raghutla & Chittedi, 2020). However, neither of these two estimators is correlated with real GDP; this could be due to the fact that the external balance is negative in Honduras during the research period (World Bank, 2022b). Exports (Exp) show a coefficient of .963 (p-value = 0.535), while Imports (Imp) have a coefficient of 1.614 (p-value = 0.404). This finding aligns with the findings of Bakari and Mabrouki (2017) in Panama.

Infrastructure (Inf), particularly telecommunications services, play an important role in economic growth; however, their effect will depend on the country's level of development (Ward & Zheng, 2016). It is denoted that this variable is correlated with real GDP, but weakly, with coefficient of .102 (p-value = 0.05). Melnyk, Dehtyarova, Kubatko, Karintseva, and Derykolenko (2019) at the global level and Adeleye and Eboagu (2019) in Africa, estimated the effect of telephone lines per 100 people on economic growth. The results in Honduras reflect that there is a statistically significant association.

As for total reserves (TR), this has a negative effect on economic development, with a coefficient of -.027 (p value = 0.240). This assertion coincides with that of Shkolnyk and Koilo (2018) who find a negative correlation between total reserves and GDP in Ukraine. Total reserves are an important indicator of confidence in an economy and its governance; their management is vital to economic growth (Morakabati, 2020). The Honduras government should exercise caution in its current policy regarding the use of these resources, as it is already facing a critical situation related to this determinant.

Investment (GFCF) has a negative influence on economic growth. Reflecting a coefficient of -.020 (p-value = 0.772). This finding is akin to that found by Jalil, Shariff, Rahmat, Abidin, and Nizar (2021) in Malaysia and Cheung, Dooley, and Sushko (2012) in an analysis conducted in 188 countries. Investment is an essential element to achieve economic growth; the increase of this potentiates the creation of more jobs (Meyer & Sanusi, 2019). The Honduran state should aim to create policies that improve the business environment, in addition to promoting the diversification of the economy.

On the other hand, trade openness (Tra) holds a relevant role in achieving economic development (Frankel & Romer, 1999). To attain sustained economic growth, countries need to produce and export a variety of high-quality products (Huchet-Bourdon, Le Mouël, & Vijil, 2018). This has no statistical relationship with real GDP, but its coefficient of -2.391 (p-value = 0.495) makes it necessary to take it into consideration. Khobai, Kolisi, and Moyo (2017) found similar results in Nigeria.

In model 2 the results show that investment and capital, normally considers essential drivers of growth, are not significant in this case. This contradicts the economic literature, which assumes a direct relationship between capital accumulation and economic growth. The lack of significance in this context points to the need for further study of the characteristics and effectiveness of investment in Honduras. Structural barriers could potentially diminish the anticipated impact.

The third model (Model 3), examines the links between education and economic growth. Education is one of the principal determinants of a nation's economic success (Barro, 1991). School enrollment, preprimary (Schoolpre), has no effect on economic growth; its coefficient is .161 (p-value = 0.157). Magnuson and Duncan (2016) indicate that raising enrollment in preschool education is important because it could generate economic benefits in adults. In Honduras, it is not an academic requirement to complete pre-primary education prior to entering primary education. In 2020, the enrollment rate at this level was only 39%, far from the 77% reported for the Latin American and Caribbean region (World Bank, 2022g). Dao and Nguyen (2020) found a similar relationship in Vietnam. For its part, school enrollment, primary (Schoolpri) with a coefficient of -1.185 (p-value = 0.010), evidences a negative and

significant relationship with real GDP. Meanwhile, school enrollment, secondary (Schoolsec), also has a negative relation, revealing a coefficient of -.030 (p-value = 0.770). This effect should cause alarm among decision-makers. For that matter, a one-point increase in the enrollment rate in primary education would produce a -1.18-point decrease in real GDP. Governments, households, and development partners, in that order, are the main funders of education. Their contributions differ significantly across the income groups of the countries conducted by the World Bank (Al-Samarrai et al., 2021). Governments are the largest funders of education in all income groups, while the direct contribution of households to education spending tends to be higher in poorer countries. In lower-middle-income countries (case of Honduras), households can finance up to 31% of total education expenditure (Al-Samarrai et al., 2021). The state is unable to efficiently cover the necessary expenses for the enrollment of children and youth. Families would be assuming the expenses derived from this, in addition to the costs associated with the partial functioning of educational centers. Abbas and Nasir (2001) in their study conducted in Pakistan, obtained comparable results in terms of primary enrollment. Adawo (2011) found a similar correlation with secondary enrollment in Nigeria. As for school enrollment, tertiary (schoolter) it recorded a coefficient of .556 (p-value = 0.00). While the correlation between school enrollment and economic growth is statistically significant, it remains relatively weak. Maneejuk and Yamaka (2021) in their research conducted in the ASEAN-5 countries (Thailand, Indonesia, Malaysia, Singapore, and Philippines), conclude that the enrollment rate in tertiary education is essential for future growth and sustainability. Similar outcomes were found by Siddique, Mohey-ud-din, and Kiani (2018) in upper middle-income countries and also by Chowdhury, Uddin, Uddin, and Uddin (2018) in Bangladesh.

Government expenditure on education (Govedu) obtained a coefficient of .080 (p-value = 0.713). This indicates that the state's investment in education has no statistical impact on economic development. This aligns with the recent findings in Honduras, as reported by Villela and Paredes (2022). The government should evaluate the efficiency and allocation of the budget, particularly with regard to a marked disproportion between current and capital spending.

Model 3 reflects findings that challenge the assumption that higher educational coverage, particularly at basic levels, is always positive for economic growth. While the literature usually emphasizes the importance of primary and secondary education, in this case, a negative or insignificant relationship is observed. This implies that enhancing the quality of education, instead of merely increasing enrollment, could hold greater significance in this particular situation. This reflects an important gap in the literature on how human capital formation influences economic growth in countries with limited labor markets.

The fourth model (Model 4) evaluates the level of relationship between non-economic determinants and economic growth. Acemoglu (2007) recognizes the role of government efficiency, institutions, and political, administrative, and social systems in the development of countries. Voice and accountability (VA), political stability (PS), and rule of law (RL) reflect coefficients of -.720 (p-value = 0.00), -.425 (p-value = 0.007) and -.362 (p-value = 0.00), respectively, indicating a negative and significant effect on economic growth in Honduras. Most of the research that has studied the relationship of the components of public governance and that has used the indicators provided by Worldwide Governance Indicators (WGI) highlight the positive influence of these on economic growth (Bouoiyour & Naimbayel, 2012) and Fayissa and Nsiah (2013). The results of this study also bear this out. Zubair and Khan (2014) found a negative relationship between political stability and rule of law in Pakistan and economic growth. While Alexiou, Vogiazas, and Solovev (2020) find a negative association in the short run between voice and accountability and real GDP. The analysis was conducted in 27 post-socialist economies. The government will need to think deeply about governance. Economic and social development would be hindered by elements such as freedom of expression, distrust in electoral bodies, coupled with the widespread perception of political instability, and skepticism among the population and investors in public institutions. In contrast, control of corruption (CC) and government effectiveness (GE) display the opposite conduct. The coefficients for each measure are .389 (p-value = 0.00) and .269 (p-value = 0.018). Both are positively correlated with economic growth; however, it should be noted that their relationship is at a low level. Corruption negatively affects the attraction of international investment. Growth is adversely affected by

the uncertainty that this flagellum causes (Cieślik & Goczek, 2018). Likewise, efficient governments supply adequate physical and social infrastructure. They avoid confiscatory taxes, enforce private property rights, and promote laws that boost the private sector (Alam, Kiterage, & Bizuayehu, 2017). Like in Honduras, Sharma and Mitra (2019) provide evidence of a positive effect between the control of corruption and economic growth in low- and lower-middle-income countries. Furthermore, Bayar (2016) demonstrates a positive and significant relation between both variables in the countries of the European Union. The state should implement strict mechanisms to curb the various forms of corruption, including the creation of laws that impose harsh and dissuasive penalties. The installation of the international commission against corruption would be an accurate contribution. The commission should also prioritize social spending and making significant improvements to the currently deteriorating public services. Finally, regulatory quality (RQ) presents a coefficient of .116 (p-value = 0.272). Therefore, this dimension of governance is found to have no relationship with real GDP. Well-defined regulations facilitate the entry of international companies into a market. This implies that regulatory quality would have an effect on capital, trade, and financial openness (Nagaraj & Zhang, 2019). This result is in line with that obtained by Radulović (2020) in the Southeast European countries (SEE) that are members of the European Union in the short term.

Model 4 reveals that some aspects of governance, such as political stability and voice and accountability, have a negative relationship with growth. This challenges the institutional theory that assumes that better governance should always contribute positively to economic development. In countries with complex political contexts, such as Honduras, these factors can generate uncertainty or tensions that hinder growth. This result has not sufficiently explored the need for a more nuanced analysis of how institutional reforms affect growth in fragile economies, as this result highlights.

5. DISCUSSION

The general results of this research indicate that the situation is discouraging. Despite this, some estimators that contribute to the Honduran economy are identified. Of the value-added sectors, the manufacturing industry has been key to the diversification of the Honduran economy in recent decades. It has facilitated the penetration of new technologies and fostered job creation. Kattan, Cerna, Venegas, and Santamaría (2019) recognize the role of this sector as a strength that Honduras possesses with respect to the rest of the countries in the region. They add that Honduras has shifted its export base to the secondary sector. Governments have responded by granting substantial tax exemptions and adopting a highly permissive stance towards the questionable conditions workers face. The primary sector, despite being the smallest contributor of the three economic sectors to real GDP in Honduras, generated 29% of total employment in 2019 (World Bank, 2022a). Coffee is the main crop in Honduras, this has led it to become one of the main producers worldwide. Herrell, Tewari, and Mehlhorn (2017) show that there is a positive correlation between the prices received by producers and their participation in coffee certification programs. The participation in coffee certification programs has been increasing in recent years. Therefore, it could be inferred that this effect would be contributing to the national economy. Countries require adequate infrastructure and broad government support in order to benefit from significant growth in the agricultural sector.

Martinez (2019) conducted a similar study in the countries that make up the northern triangle (Honduras, Guatemala, and El Salvador). Among his findings, he states that the population is the main driver of the economies of these countries. This result yields a similar result. Even so, it is likely that Honduras is wasting its human capital, essentially due to two factors: high migration flows and low productivity.

As for the effect of education on economic growth, enrollment rates at all levels and public spending on education were analyzed. The results are dramatic; the higher education enrollment rate is the only one that contributes to growth. For its part, government expenditure on education has no correlation with economic growth in Honduras. This finding refutes the results of the research conducted by Zuniga, Ordoñez, Martínez, and Ordoñez (2018) who find a positive relationship between economic growth and public spending on education.

Azam (2022) carried out research that explored the impact of governance and economic growth in 14 countries in Latin America and the Caribbean, including Honduras. The results reveal that corruption negatively affects economic growth, while political stability and government effectiveness stimulate it. Of the dimensions of governance considered in both studies, only government effectiveness displays matching results between the studies. Good governance is essential to attaining economic growth. To achieve this, Honduras should restructure its weak public institutions and take radical measures aimed at transparency and accountability for public resources.

The lack of reliable information and data in public institutions creates enormous challenges. Furthermore, there is a dearth of formal research, grounded in empirical evidence, that specifically focuses on Honduras in this field. It is hoped that this research will serve as a resource for future researchers. Considerations about the determinants of economic growth in Honduras provide revealing evidence. New lines of research related to the effect of irregular migration and remittances should be explored as determinants of growth in Honduras. In the same way, and according to the literature, it is necessary to understand the relationship of economic growth with estimators such as the exchange rate, public debt, and military spending, for example.

6. CONCLUSIONS

The results demonstrate that a single group of factors cannot explain Honduras growth. Rather, a comprehensive view that combines economic sectors, infrastructure, human capital, and governance indicators is required. This diversity of influences underscores the importance of designing flexible economic policies that can adapt to the multiple dimensions of development.

Public spending on education and enrollment in higher education exhibit a weak yet positive correlation with economic growth. The limited results in primary and secondary education indicate that educational investment is not generating sustainable long-term benefits. For education to drive sustainable economic growth, it is necessary to improve the quality of the education system and align training with future labor market demands, fostering more inclusive and lasting development.

All four models demonstrate that a combination of economic and non-economic factors influence growth. This suggests that development policies should be multidimensional and not limited to traditional approaches. This implies that policy decisions should consider both productive and institutional factors to maximize the impact on growth.

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