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| RESEARCH ARTICLE

An Empirical Analysis on the Impact of International Trade in Philippine Economic Growth

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| ABSTRACT
This study explored the impact of international trade on the economic growth of the Philippines covering the period 1981 to 2019. The study's objective is achieved by employing Multivariate Ordinary Least Squares Regression (with annual Real GDP as regressand, and Exports, Imports, Trade Openness, Exchange rate, Gross Capital Formation, and Foreign Direct Investment as regressors). The key findings of the study are as follows: (1) Expanding exports and continuous capital accumulation contribution to Philippine Economic growth, (2) Import-based Strategy is not applicable in the Philippine setting. Thus, imports have significant drawbacks, such as the devaluation of the peso, which has a significant and negative impact on the Philippine Trade Performance. Moreover, some diagnostics in the model were detected; (1) perfect multicollinearity and (2) non-normality of residuals.

| KEYWORDS
International trade, economic growth, internationalization

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1. Introduction

1.1 Background of the Study

International Trade is the exchange of goods and services between countries (Amadeo, 2021). This includes both import and export of goods and services, exchange rates across nations, etc. Global trade has been occurring since the barter system took place. One of the reasons it was established was limited resources and efficient allocation of goods and services. Moreover, in the aftermath of World War II, treaties such as General Agreement on Tariffs and Trade (GATT) and North American Free Trade Agreement (NAFTA) were implemented to regulate the growing transactions between countries. And institutions such as World Trade Organization (WTO), International Trade Centre (ITC), etc., were established to look over the agreements and promote protectionism among the members of the institutions.

Trade and Growth of the economy are interrelated (Ortiz-Ospina, 2018). Over the years, some studies have explored the relationship between international trade and economic growth. In Europe, Angel et al. (2017) analyzed the relationship between international trade and economic growth in European countries. They used imports, exports, and export coverage to measure international trade. OLS (Gauss-Newton) was deployed for estimation, and this revealed that all the variables had a significant effect on the GDP/capita of the EU. In Asia, Abiodun (2017) found that the relationship between international trade and economic growth was significant in Nigeria. Granger Causality was utilized for estimation, and a unidirectional relationship among its variables was established. And lastly, Okenna (2020) then tested the theory on developing countries, specifically African developing countries, and the study concluded that international trade is one of the macroeconomic driving factors in any economy. The author recommends that developing African countries be encouraged to engage with foreign trade. The author then mentioned that those nations should produce policies that apply to their case instead of adopting policies from western countries. However, given the literature, there is no consensus on the relationship between international trade and economic growth applicable to all contexts. Therefore, the researchers were interested in analyzing the relation of international trade in the Philippine context.

1.1.1 The Philippine Context

The Philippines engaged in international trade even before the industrialization era was established (Giraldez, 2016). Dating back to the 1500s, the country was engaging in the Galleon trade or the Manila Acapulco Trade; it is a government monopoly that consists of only two galleons, one sailed from Manila to Acapulco, and the other one sailed from Acapulco to Manila (PHIL-HISTORY.ORG, 2020). Since the country was open to trading, liberal ideas from around the world inspired Filipinos to gain independence from the Spanish colonies. From here, certain trade reforms were then established. According to Lacuna et al. (2006), the Philippines has no consistent trade policies (from the year 1949 to 2004) given the economic framework. But rather, the Philippine trade policies implemented were brought about by two main factors: (1) Global economic forces and (2) Local political economy (Lacuna et al., 2006). In addition, the frequent shifts of trade policies were also due to inefficient implementation of prior trade policies (Parcon-Santos,2011). From here, we could ask the question, "Do the trade policies implemented in the past administration regulate the trading engagements of the Philippines?" "Can the Philippines depend on International trade?" Developing countries such as the Philippines have shortcomings in utilizing their resources which often result in an inefficient allocation of goods. Therefore, such countries could resort to trading liberalization since they could have access to the resources and knowledge that they lack. However, adopting a foreign framework would not be sustainable as the countries differ in size, structure, etc. And a country could be in a disadvantage position if that country could not manage its trade policies efficiently; with this, the researchers believe that there is a need for further study on this matter as it will provide additional knowledge in terms of managing trade policies in the Philippines for the purpose of maximizing its gains and use it as a way for further economic development. This study aims to investigate the degree of relation between international trade and economic growth in the Philippine context. The researchers are interested in knowing if the country could depend on international trade as one of the driving factors of its economic growth.

1.2 Statement of the Problem

This study endeavours to answer the following questions.

1. What are the changes in the variables that occurred from 1981 to 2019 in the Philippines?
   a) Economic Growth (Gross Domestic Product)
   b) Imports (Imports of Goods and services)
   c) Exports (Exports of Goods and services)
   d) Trade openness (Percentage of trade in GDP)
   e) Exchange rate (Official exchange rate)
   f) Foreign Direct Investment (Foreign direct investment, net inflows)
   g) Gross Capital Formation (Gross Capital Formation)
2. To what degree does imports impact economic growth?
3. To what degree does exports impact economic growth?
4. To what degree does trade openness impact economic growth?
5. To what degree does the exchange rate impact economic growth?
6. To what degree do foreign direct investments impact economic growth?
7. To what degree does gross capital formation impact economic growth?

1.2.1 Hypotheses of the Study

The null hypotheses of the study are the following:

Ho1: There is no significant relationship between Imports and Economic Growth.
Ho2: There is no significant relationship between Exports and Economic Growth.
Ho3: There is no significant relationship between Trade Openness and Economic Growth.
Ho4: There is no significant relationship between Exchange Rate and Economic Growth.
Ho5: There is no significant relationship between Foreign Direct Investments and Economic Growth.
Ho6: There is no significant relationship between Gross Capital Formation and Economic Growth.

1.3 Scope and Limitations of the Study

This study encompassed the econometric analysis on the relation of international trade and economic growth in the Philippine context. Furthermore, this study tackled the degree of impact of international trade on economic growth. To conduct this study, the researchers used multiple regression analysis to evaluate the relationship between trade and economic productivity.

The study utilized time series data that would cover the period of the year 1981 to 2019, a total of 39 observations; The researchers used secondary resources (open stat websites such as world bank open statistics) in an empirical analysis of the data. This is due to limited access in collecting primary data, as well as financial and time constraints. The researchers only gathered annual data

and disregarded other periodicals since some of the indicators that were used in this study have only annual updates available in the 39-year period (1981-2019). In addition, the study only utilized aggregate (national index) data rather than regional level data since the availability of regional data is limited. Therefore, a regional analysis of the indicators was not conducted in this study.

1.4 Significance of the Study

Evaluating the relation of international trade to Economic growth could be significant to the following:

Department of Trade and Industry (DTI): One of the objectives of this study is to help the Philippine government trade policymakers to improve the accommodation of private industry and service sector needs, as well as empowering consumers – for the purpose of promoting economic growth. Since this study evaluated the relation and the degree of influence of international trade on economic growth, the findings of the study can be used by the DTI in identifying significant indicators that are needed to be prioritized or monitored in the county's public trade sector. The findings of this study can also be used in creating innovative or efficient ways that can remedy the country's current economic-related issues.

Private industries: Although this paper did not explore in detail the impact of trading on domestic firms or trends relating specifically to the productivity of the firms; Private industry could still use the findings of the study in evaluating the economic trends (used in this study) relating to their business decision making, especially to those firms which are engaging in a foreign market. This study also aims to draw the attention of private industries in coordinating with the Philippine government in increasing economic opportunities in the overall trade sector.

Households: Although the empirical analysis of the relation of international trade and economic growth is primarily in the national perspective, the findings of this study could still be beneficial to the household perspective, in the sense that it will allow them to be aware of the trade indicators (used in this study) that could help in boosting the economy. Furthermore, it will make them conscious about how the government performed (in trade sector) throughout the given decades and will operate in the future.

Future Researchers: This study could be beneficial to future researchers as the ideas presented may be used as reference data in conducting new research or testing the validity of other related findings, and it could also serve as a related study for their research.

2 Review of Related Literature

2.1.1 International Trade and Economic Growth

Neoclassical economists have stressed the importance of trade as a catalyst for economic growth. From these, various researchers have taken an interest in investigating the relationship between international trade and economic growth - especially innovation and intra-border trade. Research has shown that trade can boost efficiency through resource reallocation.

Angel et al. (2017) studied the link between global commerce and economic development in European countries. They measured international trade through imports, exports, and export coverage. They employed simple regression analysis for each variable and multiple regression analysis for the whole research, and OLS (Gauss-Newton) was used for estimation.

Blavasciunaite et al. (2020) used panel data from 28 European Union countries from 1998 to 2018 and used OLS multivariate analysis with fixed effects to estimate the impact of trade balance deterioration on economic growth. They discovered that a declining trade balance had a considerable negative effect on economic growth, regardless of whether it began as a deficit or surplus.

Makhmutova and Mustafin (2017) discovered that Germany is the most reliant on trade, followed by the US, China, and Russia. Despite prior losses, the population's well-being continues to increase, negating the importance of international commerce to China. The role of international trade on a country's overall economic condition differs by country.

Okenna (2020) asserted that GDP is related positively to exports and imports, whereas GDP is negatively related to the exchange rate. Their research found that long-term economic progress in underdeveloped nations requires international trade. However, for developing countries to succeed through international commerce, they must adopt localized trading policies.

A study has found that international commerce and economic growth are positively related. Abiodun (2017) investigated the contribution of international trade to Nigeria's economic growth. OLS (Ordinary Least Squares) regression analysis and Granger Causality were used to evaluate causality between the regress and regressor.
Furthermore, Ali and Xialing (2017) looked at how FDI affects economic growth in Pakistan—utilizing time-series data from 1991 to 2015 and estimated data using Johansen Integration and Granger causality. The research revealed that International Trade, FDI, and Economic Growth are positively related in Pakistan.

Faraz (2019) concludes that the correlation between trade and development is strong and would bring radical changes in the economy; however, this would depend on policymakers' decisions, resource development, and investments that facilitate resource development. (Nguyen 2020) concluded that Vietnam's export activity improved its balance of payments, controlled inflation, and generated employment showing that export had a beneficial influence on the Vietnamese economy from 2000 to 2018. Vietnam's initiatives to participate in international commerce created the stage for a favorable scenario, increasing company exports (Nguyen, 2020).

The linkage between trade and economic growth lies greatly in the creation of job opportunities fostered by foreign investments, and this reduced unemployment in Ghana (Yennu, 2018). Ghana's economy has grown significantly over time, mostly due to corporate expansion and free trade improved the country's efficiency and distribution of resources and materials. On the other hand, (Yennu 2018) asserted that due to a lack of capacity for economic infrastructures, a country faces low employment, slow social progress, and excessive inflation despite growth.

Both developed and developing countries have established links between trade and economic growth. The impact of international trade differs by country, meaning that certain trade rules and strategies are only effective in one country but not in another. The importance of trade indicators in improving economic growth will be emphasized in the following section.

2.1.2 International Trade Indicators and External factors

One of the key components in formulating a strategy towards economic progress is A key component of devising a strategy for economic progress is evaluating current trends. Since previous research has shown that the effect of international trade varies by country, we can infer that the economic variables that drive trade would also vary. Thus, it is crucial to understand what trade indicators promote economic growth and what should be monitored to prevent fluctuations. From here, several studies have incorporated different trade indicators. The following studies are as follows:

2.1.3 Exports and Imports

Wabiga and Nakihoba (2018) examined the relationship between high technology exports, Gross capital formation, and economic growth in Uganda. The empirical results under Vector Autoregressive Model suggest that in the short run, high-tech exports do not have a significant impact on economic growth.

A study by Sultanuzzaman et al. (2019) examined the effect of export and technology on the economic growth of emerging Asian countries. There was a significant and positive impact of trade and technology revealed in the long-run estimation. The authors recommended that policymakers should devise attractive policies that can enhance advancement and trade to sustain economic growth.

Tang and Abosedra (2019) concluded that policies improved developing countries' productivity by maximizing exports of commodities and services. Logistics connects local economies to the global economy, allowing cross-border economies. Transportation, technology, and ICT advancements have accelerated the globalization of the economy. Moreover, Ekananda and Parlinggoman (2017) found that high export growth influences economic growth in all countries and that it has a positive impact on poverty reduction.

Raghutla (2020) claims that cross-border trade in commodities and services promotes economic growth. High-tech export sectors influence a country's GDP through productivity, which would be felt more strongly in countries with a smaller high-tech industry compared to smaller low-tech industries.

A study by Erkişi (2019) looked at export, import, and economic growth in the Middle East and found that imports and exports were unidirectional rather than bi-directional, as previously thought. It used a range of tools, including Westlund EMC Panel Cointegration and PGM estimator, to examine the relationship between production and consumption in the region.

Redmond and Nasir (2020) showed that financial development affects growth through increasing capital accumulation rates, which in turn affects local and international capital investments. For this reason, international trade, financial development, trade openness, and institutional quality positively affect economic growth.

Vietnamese author Nguyen (2020) finds that FDI (positively related and has a significant impact) is more important than Exports or Imports for economic growth. The author then recommends policies for Vietnam to enhance FDI as a driving economic variable in order to boost the economy.

2.1.4 Trade Openness

Considering the previous studies, exporting and importing commodities has grown significantly in several countries' economic activities, which led to another factor, trade openness. Alan and Sumon (2019) revealed that there is a substantial positive association between trade openness and economic development in all 14 Asian nations, except one noted as an insignificant result.

Keho (2017) looks at trade openness and economic growth in Côte d'Ivoire. This study's multivariate approach covers trade openness, labor, and capital stock as repressors. Yamamoto Granger causality was used to estimate ARDL data. The research found a short- and long-term link between trade openness and economic development.

In a multivariate approach, Khobai and Chitauro (2018) examined the impact of trade liberalization on Switzerland's economic growth. The variables were linked using auto-regressive Distributed-Lag, implying a result that trade openness benefits the country's economic growth.
The impact of trade interaction varies per country and depends on factors such as development, size, technological advancements, etc. A study by Siladizic and Mehic (2018) concluded that trade intensity is related to economic growth and does not reflect policy regime.

The link between trade openness and economic development could be bidirectional, according to Çevik et al. (2019). There is a "sequential feedback relationship" between the determinants since the impact of trade openness on economic growth is quicker than the opposite. The researchers used Breitung and Candelon's frequency domain Granger-causality test for calculation.

2.1.5 Exchange rate

Inflation raises Indian prices, making local items more expensive while international ones become cheaper. Shaik and Rao (2020) found that inflation generates an increase in imports and a fall in exports. The research concluded that the exchange rate, trade, and GDP are related in the short term.

South Korea's economic strategy aims to establish a balanced trade and amass foreign reserves. International trade is acknowledged as vital to a developing nation's economy. Research shows that exchange rates have a considerable impact on South Korean exports, indicating that these exchange rates are beneficial to the South Korean economy (Irsahd and Xin, 2017).

Karahan (2020) studied the Turkish economy from 2001 Q1 to 2019 Q2 using the Johansen Cointegration and Granger Causality (based on Error Correction Model). The study concludes that exchange rate and economic growth are mutually exclusive in Turkey.

An increase in the real exchange rate has a negative impact on China's economic growth. The authors conclude that there is inadequate evidence to support the contractionary devaluation of the Chinese yuan Shu-Ping & Xiao-meng, 2017).

There is a positive relationship between GDP and Forex and a negative relationship between Inflation rate, as well as the interest rate. Low and Chan (2017) discovered a dynamic causal effect between the variables for Malaysia's economic growth over the past 50 years.

2.1.6 Gross Capital Formation

Established and advanced countries' gross capital formation could outperform emerging economies such as India. In low-income countries, capital formation inhibits economic progress (Ramaiah & Reddy, 2020). A rise in capital formation will also stimulate economic growth (Altinoz et al.,2020).

Savings and borrowing are equal in a closed economy, but strong capital formation leads to significant productivity and successful economic growth. Aslan & Altinoz (2021) found that investment-saving equality increased productivity, improved economic growth, and elevated high-level capital formation in closed economies.

In his study, Hakabwandi (2020) claims that the low rate of capital formation in less developed countries was due to the lack of variables influencing capital formation (Hakabwandi, 2020). On the other hand, the author determined that Gross capital formation had a positive and large influence on economic growth but had a negative effect on the forex rate upon using the Vector Error Correction Model (VECM).

South Africa's economic crisis was caused by the country's prolonged economic drought (Garidzirai & Pasara, 2020), and scholars believe that gross capital formation could significantly improve their economic situation, enabling increased employment, human capital, and so on.

Using structural equation modeling, Shahbaz et al. (2021) indicated that gross capital formation has a minor impact on economic growth. The in-depth investigation also recommended key policy recommendations for sustainable resource utilization. Their study also found a negative relationship between natural resources and economic growth, corroborating the resource curse argument. Meanwhile, financial transparency couldn't turn the resource curse into a benefit.
Rwanda needs to develop infrastructure and services to attract investors and minimize trade imbalance. It is possible to assure that certain public investments dominate private investments, hence increasing Rwanda's GDP through higher capital formation. Masengesho & Ntamwiza (2022) explored the patterns and correlations between capital formation, foreign direct investment, and economic growth in Rwanda using time series data from 1990 to 2017.

2.1.7 Foreign Direct Investments

Despite substantial progress in liberalizing FDI policy, barriers to foreign investment persist. Constitutional limitations restrict foreign investment in certain sectors, such as the media, small-scale mining, private security firms, and pyrotechnic devices. A tightening of investment and property ownership restrictions exacerbated corruption, harming the Philippines' reputation with FDIs (Parcon-Santos, 2019).

Goh et al. (2017) investigated the long-run relationship between FDI, exports, and GDP in selected Asian countries. Their results demonstrated that the lack of long-term forcing linkages between foreign direct investment and GDP exports was not the sole reason for their economic success.

According to Stojanovic-Trivanovic (2017), FDIs are independent long-term capital movements driven by economic objectives, with profit as the primary goal. Foreign Direct Investment can give various economic benefits to foreign investors, including reduced transportation costs (both inputs and completed goods), cheaper labor costs, and relative proximity to customers.

ASEAN-5 countries have shown that foreign firms establishing operations in these countries play a major part in strengthening their technological capabilities (Ridzuan et al., 2018). Gross domestic investment (GDI) is a more potent source of capital than neoliberal foreign direct investment (FDI) for boosting economic growth.

The presence of South Korea in terms of FDI stems from the country's rapid economic development and expertise in new information and communication technologies. Hamat et al. (2017) concluded that Foreign Direct Investment (FDI inflows) have resulted in higher growth and lower pollution levels in South Korea.

Dinh et al. (2019) conducted a study focusing on the contribution of FDI to short and long-term economic growth rather than the FDI-output volatility correlation. They asserted that various occurrences of economic distortions might compromise FDI's utilization as a vehicle enabling advanced technology transfer.

Ekanada et al. (2017) stated that the contribution of FDI to economic growth is found to be distinctive in every country due to inadequate human capital, geography, trade policies, and other factors. Makiela & Ouattara (2018) concluded that FDI had made strides in recent years via input accumulation but not through total factor productivity growth.

Transport and logistics infrastructure make a significant contribution to developing countries' FDI and long-term sustainable economic growth (Akhtar et al., 2020). As a result, their findings may assist developing country's decision-makers in designing and implementing modern transportation and logistics systems that will attract more FDI.

2.1.8 International trade: A Philippine Context

Economic growth occurred in the Philippines as a consequence of economic policies designed to coordinate, support, and promote trade and other economic activities. The Philippines' economy grew rapidly in the 19th century owing to huge advances in trade from increased coastal and inland trade (Abueg, 2017).

Although the Philippines initiated trade liberalization and market-based reforms early on, no tangible results were apparent (Bayudan-Dacuycuy & Serafica, 2019). Due to the massive increase in manufactured goods demand, big countries restructured their economies, focused on shifting resources from agriculture to industry, a process called structural transformation.

According to Bayudan-Dacuycuy & Serafica (2019), a nation's export basket is significant in its long-term economic progress. Emerging economies need to prioritize investing in human resources, infrastructures, and trade. The export success is more likely connected to the nation's ability to stimulate foreign direct investments (FDI).

Philippine studies assert that trade has significantly changed the Philippine economy. Global value chains and free trade agreements have improved industrial processes. This improvement enabled the Philippines to engage in bigger-scale manufacturing, resulting in economic growth, more employment, foreign currency inflow, and reduced poverty (Quimba et al., 2020).

Philippines' free trade agreements (FTA) allowed for the zero-tariff importation of several items, benefiting the economy by increasing worker productivity (Quimba et al., 2020). The data show a substantial link between industry expansion and worker productivity.

Philippine researchers found that international trade positively impacts the Philippine economy. Acquiring knowledge, stronger networks, and the transfer of technology help the nation boost its export ladder. Alburo (2018) mentioned that countries which engage in trade are more likely to accelerate their economy due to access to comparative advantages.

The presence of poor rural producers taking advantage of trade opportunities impacts the trade itself in the rural sector. The evidence of unequal opportunities can be exhibited in the form of poorly established infrastructures for transport which includes roads, port facilities, etc. (Sta. Romana, 2017). There is a lack of understanding of whether trade has a relationship with the livelihoods of underprivileged individuals.

The country does not have an adequate macroeconomic database. This means that more studies are needed to have a better understanding of the macroeconomic variables, which can improve the formulation of economic policies (Parcon-Santos, 2019).

2.2 Synthesis

The majority of the related studies have established the relation of international trade and economic growth regardless of different methodological approaches. Moreover, most of the empirical studies suggest that the impact of international trade varies country by country, and there are a lot of factors that are needed to be considered, such as the structure of the economy, the size, technological advancement, etc. Some studies concluded that export has a positive impact on their subject environment. Some studies have found out that trade openness also has a positive impact on their subject environment; some studies have found that exchange rate has a negative impact on their subject environment, and some concluded otherwise. Some studies found out that foreign direct investment has a significant impact on their subject environment, and some also concluded otherwise. Some researchers concluded that gross capital formation helps boost the economy, and some concluded otherwise. From here, the most prominent trade indicators that were used by the different studies and are deemed to have a significant influence on economic growth were exports, trade openness, exchange rate, foreign direct investments, and gross capital formation.

The significance of the findings of prior studies in this paper is that they helped the researchers in setting parameters for their research framework. In line with this, the researchers have included some trade indicators (Exports, Imports, Trade openness, Exchange rate, Foreign Direct Investments, and Gross Capital Formation) used by the prior studies to the scheme of this paper. In addition, the recommendations of the prior studies would also allow the researchers to carry out the objective of this study. Moreover, scrutinizing and testing the hypothesis is one of the factors in integrating the ideas of the previous paper, and allowing this study to apply all the theoretical or previous knowledge in a foreign environment would allow the researchers to analyze and include certain elements found in the subject environment that might not be present in the prior studies; Other findings and indicators, such as inflation rate, interest rate, export coverage, high tech exports, employment rate, labor, etc. that were used in previous studies and are not included in the study's framework and were not explored thoroughly by the researchers for the purpose of narrowing down the topic and clearing the intent of this study.

2.3 Theoretical Framework

Several economic theories have been proposed to understand the concept of international trade and identify areas where nations can capitalize on taking advantage of this. Only a few of the theories will be examined and evaluated in this paper.

2.3.1 International Trade and Economic Growth

Classical trade theories suggest that a country would benefit from international trade through specialization and efficient allocation of scarce resources. This is because international trade stimulates growth in technology, expansion, and skills that leads to increased economic productivity, income, and growth. In addition, these theories have three assumptions: (1) There are two countries producing different goods; (2) Perfect mobility of production factors between countries coexists; (3) Economic size of both countries are equal and the same. Some of the commonly known classical trade theories are the Mercantilist theory of Trade and the Heckscher-Ohlin theory of international trade.

The Mercantilist theory of trade suggests that trade is a one-way transaction, and the country's goal is to have a trade surplus. This theory emphasizes that government intervention is needed to have an efficient trade engagement. In addition, the role of government in trading is to encourage exportation of goods (by promoting exportation strategies) and discouraging imports (through monetary and fiscal policy measures) since it is believed in this theory that exportation would help drive the nation's productivity in achieving its macroeconomic goals. From here, it can be drawn that export has a positive effect on economic growth.

Heckscher-Ohlin's theory of international trade was hypothesized by Eli Herscher and Bertil Ohlin; the Heckscher-Ohlin theory suggests that a nation should only export goods that they could produce efficiently in excess and only import goods that they need and cannot produce efficiently with minimal cost. The theory emphasizes that international trade is determined by imbalances in resources, and nations should take advantage of these imbalances in resources to maximize their earnings, expand their capital base and use it as an opportunity to develop their respective economies.

From here, it can be drawn that importing goods does not necessarily mean that it is bad for the economy. Still, it helps the economy maximize its resources by minimizing the cost of production. From two classical trade theories mentioned, they emphasize that trade engagements such as exportation and importation would be beneficial to the economy. Therefore, trade openness could also have a positive implication on economic growth.

2.3.2 Exchange rate and Economic Growth

The Balance of Payment Theory of Exchange Rate states that the exchange rate currency rate is significantly influenced by the balance of payments position of a country. A deficit of BOP indicates that the demand for the foreign exchange (currency) exceeds its supply at a given rate of exchange; it means that the foreign currency appreciates, thus a depreciation of the domestic currency. A surplus of BOP indicates that the supply of foreign (currency) exceeds the demand for it; this means a devaluation of the foreign currency, thus an appreciation of the domestic currency.

From here, looking at the lenses of absorbance approach developed by Sydney Alexander (1952), if a country has a deficit in its BOP, it indicates that the people are 'absorbing' more than they produce, meaning to say the domestic expenditure and investment is greater than the national income. If a country has a surplus in their BOP, then this means that they are absorbing less than what they produce. Meaning to say the national income is greater than the domestic consumption and investments. So here, Alexander defined the BOP as the difference between national income and domestic expenditure. This means that BOP can be improved by increasing domestic income or reducing domestic expenditure. For this purpose, Alexander (1952) advocates devaluation (reduction of value of the currency of one country to another) since it acts on both ways. The depreciation on trade would be unfavourable since the devaluing country would need to export more goods to import the same quantity. And if the trade balance deteriorates from devaluation, the national income would decline. Therefore, this approach reflects how the exchange rate affects national income. Thus, a devaluation of the currency would have negative implications on national income and vice versa.

2.3.3 Gross Capital Formation, Foreign Direct, and Economic Growth

The Solow-Swan growth Model (neo-classical growth model/exogeneous -growth theory) pioneered by Robert Solow (1956 and 1957) assumes that economic growth is generated by the accumulation of external factors of production such as stock of capital and labor, it implies that capital accumulation contributes directly to the economic growth. Thus, gross capital formation has a direct impact on economic growth. In addition, foreign direct investment contributes to the increase of capital stock, which directly affects economic growth. This framework shows that FDI also promotes economic growth by increasing investment efficiency in the nation. Thus, FDI has a direct impact on economic growth.

3 Research Methodology and Design

3.1 Research Design

This paper aims to evaluate the relationship between International Trade and Economic Growth. In this study, a quantitative correlational approach was employed. This type of approach highlights the relationship between the regressand, the Economic growth, and the regressors – Imports, Exports, Trade Openness, Exchange rate, Gross Capital Formation, and Foreign Direct Investment.

A correlational quantitative design was used to empirically analyse the direction and magnitude of the relationship among the variables used in the study. Moreover, it is designed to investigate the changes in one phenomenon to the changes in another.

3.2 Data Description and Collection

The regressand, Real Gross Domestic Product, will be used as a proxy to Economic growth. The real GDP is calculated using the Gross Domestic Product (at 2010 constant price in US dollars). The regressors that were determined to measure the International

Trade in the Philippines are Imports, Exports, Trade Openness, Exchange rate, Gross Capital Formation, and Foreign Direct Investment. Imports were calculated using Imports of Goods and Services (at 2010 constant price in US dollars) (from national accounting). Exports were calculated using Exports of Goods and Services (at 2010 constant price in US dollars) (from national accounting). Trade Openness was calculated using the Percentage of trade in GDP. Exchange Rate was calculated using the Official Exchange rate, Gross Capital Formation was calculated using Gross capital formation (constant price 2015 US Dollars), and Foreign Direct Investments was Calculated using Foreign direct investment net inflows (BoP, current US$). The time-series data used to measure the variables covering the period 1981 to 2019 were obtained from the available statistics of the World Bank. The summary of descriptive statistics of data used in modelling the relationship between economic growth and international trade in the Philippines is presented in *Table 3.2.1*.

Table 3.2.1 ***Descriptive Statistics***

	RGDP	EXPT	IMPT	TRD	NUS	RGCF	FDI
Mean	25.69126	24.35986	24.38645	4.206531	3.477064	24.11161	20.66652
Median	25.59192	24.43853	24.50666	4.191233	3.743102	24.01187	21.11396
Maximum	26.61175	25.59922	25.78708	4.684446	4.026064	25.33733	23.05117
Minimum	25.07837	23.22899	22.99506	3.826662	2.066818	23.11580	16.01274
Std. Dev.	0.457882	0.699098	0.774874	0.225452	0.517115	0.544591	1.707829
Skewness	0.485664	-0.016966	-0.099062	0.167010	-1.117700	0.657130	-1.141039
Kurtosis	2.009251	1.863559	2.103163	2.097595	3.595402	2.980142	4.124861
Jarque-Bera	3.128223	2.100557	1.370802	1.504594	8.696211	2.807469	10.518393
Probability	0.209274	0.349840	0.503888	0.471283	0.012931	0.245678	0.005198
Sum	1001.959	950.0347	951.0715	164.0547	135.6055	940.3527	805.9942
Sum Sq. Dev	7.966927	18.57203	22.81631	1.931491	10.16151	11.27001	110.8338
Observations	39	39	39	39	39	39	39

3.3 Econometric Model

This study adopted a Multivariate Ordinary Least Square (OLS) regression model presented as:

$$Y = \alpha + \beta 1\, X1 + \beta 2\, X2 + \beta 3\, X3 + \ldots + \beta n\, Xn + \varepsilon t$$

The researchers adopted the econometric model of Okenna in 2020, where he evaluates the relation of International Trade and Economic Growth. The model in his study was modified by the researchers to meet the objective of this study; it is shown below how the regressand, Economic Growth (RGDP) is affected by the regressors (RDGP, EXP, IMP, TRD, NUS, RGCF, FDI):

$$\boldsymbol{RGDPt = \beta 0 + \beta 1\, EXPTt - \beta 2\, IMPTt + \beta 3 TRDt - \beta 4 NUSt + \beta 5 RGCFt + \beta 6 FDIt + \varepsilon t}$$

Whereas:
RGDP = Economic Growth
EXPT = Exports
IMPT= Imports
TRD = Trade Openness
NUS= Exchange Rate
RGCF= Gross Capital Formation
FDI = Foreign Direct Investment
ε = error term

As the measurement of each variable is different, the researchers employed natural logarithm to neutralize any variation caused by the other units of measurement of the gathered data, and this is also to prevent deceptive and non-stationary results, the benefit of treating the variables in their log forms is that small change in the variable can directly be interpreted as percentage change, to an estimation that provides it a substantive sense (Gelman & Hill, 2007). In this case, the initial multivariate OLS model changes to:

$$logRGDPt = \beta 0 + \beta 1 logEXPTt - \beta 2 logIMPTt + \beta 3 logTRDt - \beta 4 logNUSt + \beta 5 logRGCFt + \beta 6 logFDIt + \varepsilon t$$

The degree of impact of each indicator of international trade on economic growth was determined by the beta coefficients (βn) of each variable, respectively, and the significance of the relation of each variable was determined by the hypothesis testing and is discussed in the following sections.

Table 3.3.1 ***Assumptions for each variable***

Independent Variables	Assumption	Expected Sign
Exports	As exports increase, Economic Growth also increases and vice versa	(+)
Imports	As imports increases, Economic Growth decreases and vice versa	(-)
Trade Openness	As trade openness increases, the economic growth increases and vice versa	(+)
Exchange Rate	As exchange rate devaluate (devaluation of peso), economic growth decreases and vice versa	(-)
Gross Capital Formation	As capital accumulation increases Economic Growth increases and vice versa	(+)
Foreign Direct Investment	As FDI increases, Economic Growth increases and vice versa	(+)

3.4 Instrumentation

The researchers utilized MS Excel (Microsoft Excel) for the transformation of the data set and EViews (Econometric Views) to conduct the multivariate OLS regression, with the following treatments: coefficient of determination (R-squared) for the goodness of fit of the model; for individual hypothesis testing of the significance of each variable, T-test, and P-values; For overall significance test of the model, F-test and P-value. Since this study would be dealing with secondary data, it is prone to problems that violate the assumptions in regression analysis and may result in the invalidation of the estimation and arriving at unreliable conclusions. To avoid such issues, the researchers employed the following test to detect if such diagnostics exist in the model. (1) for testing of multicollinearity, Variance Inflation Factor was used; (2) for testing serial correlation, Breusch-Godfrey Serial Correlation LM test was used; (3) for testing of heteroscedasticity, Breusch Pagan-Godfrey was used; (4) For testing specification error, Ramsey RESET test was used; (5) and normality test, Jarque-Bera test was used. The mentioned tests are discussed thoroughly in the statistical treatment section.

3.5 Statistical treatment of the Data

The following treatments were completed according to the procedures provided by Gujarati (2004):

3.5.1 Coefficient of Determination or R-squared test

This treatment is used to evaluate and determine the percentage of change that is attributed to the regressors. This will be used to determine if the observations (gathered data) would fit the regression line. This is also employed to assess the goodness of fit of the model. If the value of R^2 close to 100% or greater than 80%, it implies that the econometric model is stable.

3.5.2 Hypothesis Testing for the Individual Significance (T-test)

This test is used to determine the significant relationship of each regressor to the regressand. This test will affirm if the regressors (exports, imports, trade openness, exchange rate, gross capital formation, and foreign direct investment) have a significant relationship with the economic growth. In this test, the null hypothesis (regression coefficient is equal to zero) should be rejected to conclude that the regressor has an impact on the regressand. The decision rule for this test is that the computed t-statistics must be greater than the critical t-value.

An alternative approach would be to evaluate the p-value of each coefficient. The P-values are obtained using statistical software. The decision rule for this approach is that the P-value must be lower than the level of significance (5%) for it to conclude that the regressor has a significant impact on the regressand.

3.5.3 Hypothesis Testing for the Overall Significance (F-test)

This test is employed to evaluate the overall significance of the model. This test will affirm that overall, the relation of foreign trade and economic growth in the Philippines is significant. In this method, F-statistic must be greater than the critical F-value for the null hypothesis to be rejected; this implies that all the regression coefficients are equal to zero.

An alternative approach would be to evaluate the p-value of the F-statistic. The p-value is obtained using statistical software. The decision rule for this approach is that the P-value must be lower than the level of significance (5%) for it to conclude that the regressor has a significant impact on the regressand.

To validate the conclusions and findings of this study, The researchers would employ tests to detect if there are problems with the model or the data that would be used in this study:

3.5.4 Testing for Multicollinearity

The presence of multicollinearity (regressors has a linear relationship among other regressors) in the model could be crucial as this would result in an unreliable estimation of data and would make the model biased. That is why the detection of this problem would help the researchers in finding remedies for the treatment of data. To detect multicollinearity, the researchers would employ the Variance Inflation Factor (VIF).

3.5.5 Test for Serial Correlation (Autocorrelation)

Since this study used secondary data, one of the common problems encountered is the presence of autocorrelation (observations being correlated) in the model. This could lead to a biased estimator, unreliable estimation, and incorrect conclusions. To detect such a problem, the researchers employed the Breusch-Godfrey Serial Correlation LM test so that the researcher could attend to the problem that could arise with the data. In this test, to not reject the null hypothesis of having no serial correlation up to 1 to 3 lags, the chi-square probability of the auxiliary regression's product of observation and r-squared and the p-value of the regressors that is automatically calculated by economic software. Estimated in the test should be greater at the level of significance.

3.5.6 Test for Heteroscedasticity

Another problem researchers encounter when dealing with uncontrolled variables is heteroscedasticity (terms are not homoscedastic). This causes the OLS estimators to be not efficient that resulting in unreliable estimation. Therefore, the researchers would employ Breusch Pagan-Godfrey to detect if such a problem exists in the data. In this test, the chi-square probability of auxiliary regression's product of observation and r-squared and the p-value of the regressors are greater than the level of significance; otherwise, we reject the null hypothesis and conclude that the residuals are heteroscedastic.

3.5.7 Test for Misspecification

Specification error is another problem where there is an omission and inclusion of a relevant regressor or usage of an incorrect functional form; this may result in unreliable results or not inefficient outcomes and may affect the significance of the model itself. To detect such a problem, the researchers would employ the Regression Specification Error Test (RESET) – Ramsey RESET. In this test, the F-test of the auxiliary regression should be greater than the value of the level significance; otherwise, we reject the null hypothesis and conclude that a misspecification of the model has occurred.

3.5.8 Test for Normality

Non-normality of error terms causes the test of significance to be not applicable, leading to again, unreliable results. To detect this problem, the researchers would employ the Jarque-Bera Test (JB). In this test, the p-value should be high (higher than the level of significance); otherwise, we reject the null hypothesis and conclude that there is a non-normality of error in the model.

4 Results and Data Analysis

4 .1 Trends of the Variables

In this section, the researchers aim to address the statement of problem number one by presenting a chart and analysis of variable trends. Moreover, the discussion and analysis of the trends would give insights and relate the regression results in the Philippine economic context.

Figure 4.1.1 **Philippine Real Gross Domestic Product (1981-2019)**

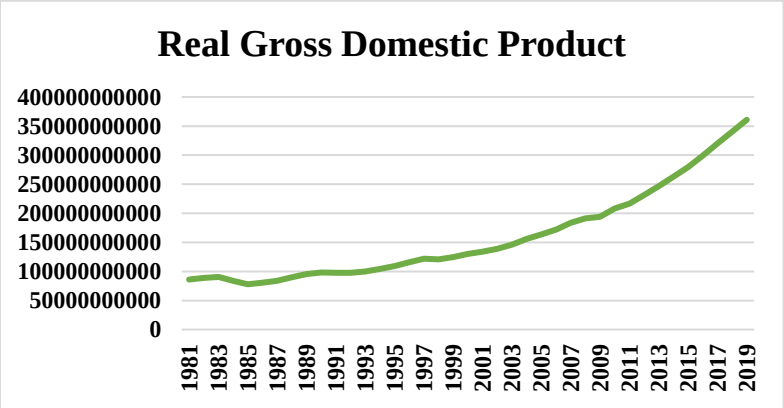


Figure 4.1.1 above shows the trend of the real gross domestic product of the Philippines from periods covering 1981 to 2018. By looking at the graph, it can be observed that the period 1980 to 1992 had a stagnant growth in terms of real GDP and the trend increased in 1996. Eventually, the trend of steady growth continued annually until 2018. Figure 4.1.1 shows that the Philippine real GDP declined after 1982, which is under the Marcos administration. This decline can be traced as a result of failing economic policies and management, as well as the exponential growth of debt in the late 1970s (M & Punongbayan, 2016). This exponential growth of debt affected the real GDP as interest payments as a share of the national income increased as well. Similarly, the period 1980-1985 had a gradual rise in unemployment, which led to the deterioration of Filipino households and the real GDP.

In 1986, under the Aquino administration, the government adopted an ambitious reform agenda that integrated trade liberalization and exchange regimes (International Labor Organization, 2019). It was followed by the period 1992 under Ramos administration, which adopted a host of reforms that ignited the rapid, sustainable growth path of the real GDP. Overall, the reforms in these periods had a favourable impact on the Philippines' real GDP. The country experienced productivity growth, and per capita growth increased as well. The stable economic growth from periods 2005-2018 resulted from a continuous increase in the country's employment rate, reduced inflation rate, and infrastructure development from the fiscal policies of Arroyo and Aquino Jr.'s terms.

Figure 4.1.2 **Philippine Exports of Goods and Services (1980-2019)**

Figure 4.1.2 presents the trend of the Philippine exports of goods and services for the period covering 1981 to 2019. Based on the graph, it can be observed three growth stages, unstable growth for periods 1981 to 1986, minimal growth from 1986 to 1996, and stable growth starting from the 2000s to 2019.

Similar to figure 4.1.1, the figure above has the same pattern of stagnant growth for the Marcos term 1980-1986. During this period, the country experienced a ballooning debt, making the Philippines unattractive to foreign investors (International Labor Organization, 2019). Likewise, the market environment made the Philippine exports less competitive. After this, a small growth in the exports is demonstrated in the graph.

This stagnant growth is primarily a result of the democratic restoration and economic rehabilitation implemented by the administration post-war. After the Marcos administration, the succeeding government led by Corazon Aquino pursued structural adjustment and started to open the economy once again for international trade, therefore increasing the rate of exports in the years 1986 to 1992.

In 1992, huge growth in export was demonstrated under the Ramos administration, and this is a result of the government's initiatives on reorganizing the export sector of the country by signing executive order 98, which aims to create a business environment that will enhance growth and expansion of the export sector of the Philippines. In addition, the creation of the Export Development Council made the export flourish based on the graph. This growth stabilized annually with the reforms of succeeding administrations focusing on trade liberalization and enhancement of the agricultural sector for export.

Figure 4.1.3 presents the trend of the Philippine imports of goods and services for the period covering 1981-2019. The graph is similar to figure 4.1.2 However; there is a decline for the period 1981 to 1986 before having a stable growth from 1990 to 1996. Stable growth is present from 2000 to 2010, while the period 2010 started a rapid growth annually until 2018.

The decline in the Philippine imports in the 1980s resulted from the Marcos administration's suspension of import liberalization programs, the introduction of general import tax, and the implementation of additional import duties (La Luna et al., 2006). Minimal growth was demonstrated in the period 1986 to 1992, but it can be observed that 1992 started an increase in the trend, resulting from the signing of executive order no. 288 under the Ramos administration, which aims to modify the rates of import duties on selected import goods. This is one among the programs implemented by the Ramos administration, which focuses on import liberalization and tariff programs which are essential policies for restructuring the level of trade across different sectors of the economy.

In 2010s, the import of goods and services increased because of the increasing demand for capital goods and mineral fuels. In relation, the administration solidified the partnership between major import partners China, Japan, and the US (Rabobank, 2011). In addition, the enormous demand for oil and rice made the import rate significantly higher than in previous periods.

Figure 4.1.3 **Philippine Imports of Goods and Services (1981-2019)**

Figure 4.1.4 presents the trend of Philippine Trade Percentage in GDP for the period covering 1981 to 2019. It can be observed that the Philippines ' percentage of Trade in GDP had steady growth from 1986 to 1998, and from that point, the share of Trade in the Philippines declined until the early 2000s.

The increase of trade percentage in GDP from the year 1986 to 1998 was due to the resumption of trade liberalization and structural adjustments under the Administration of Aquino, as well as the accession to WTO (less restrictive trade policies) under the administration of Ramos (Sicat, 2002). Then the sudden decrease in trade percentage from 1999 to 2000 was due to the unproductive term of Estrada's Administration. The trend continued to fluctuate due to the drawbacks of foreign gambit under Arroyo Administration (De Castro, 2010).

Figure 4.1.4 **Philippine Trade Percentage in GDP (1980-2019)**

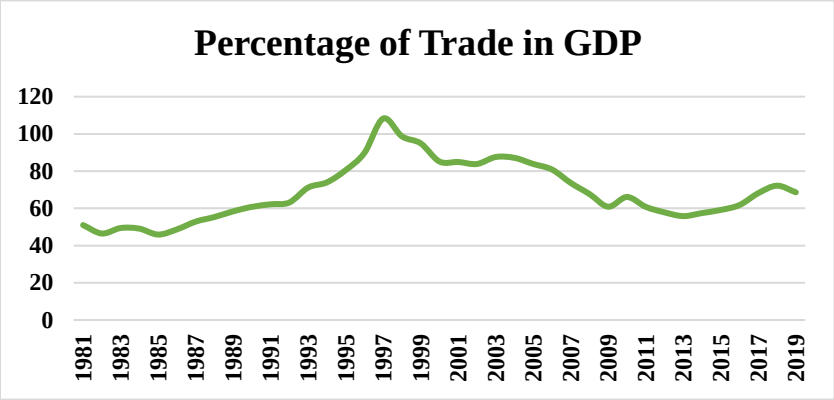


Figure 4.1.5 presents the trend of the Philippine Official Exchange Rate for the period covering 1981 to 2019. As shown above, it can be observed that the Philippine peso has significantly depreciated against US Dollars from 1980 to 2004 (*note: The exchange rate data used has a direct quotation*).

The sudden devaluation of the peso against the dollar in the early 80s was the result of mismanaged foreign debt under the administration of Marcos. In addition, the resumption of trade engagement in the Aquino administration worsened the devaluation of the peso, as the Philippines experienced substantial deficits in trade balance as well as the rising government budget deficits in the 90s, and in the early 2000s, the devaluation peso, reached its peak, due to the increasing demand for imported goods and solidified a partnership with China, Japan, and US as mentioned in the previous trend (Figure 4.3). The Philippine currency is still weak at present due to narrowing current accounts and the slow inflow of remittances. However, there are also external factors to consider, such as the strengthening of US dollars due to their economic stimulus.

Figure 4.1.5 **Philippine Official Exchange Rate (1980-2019)**

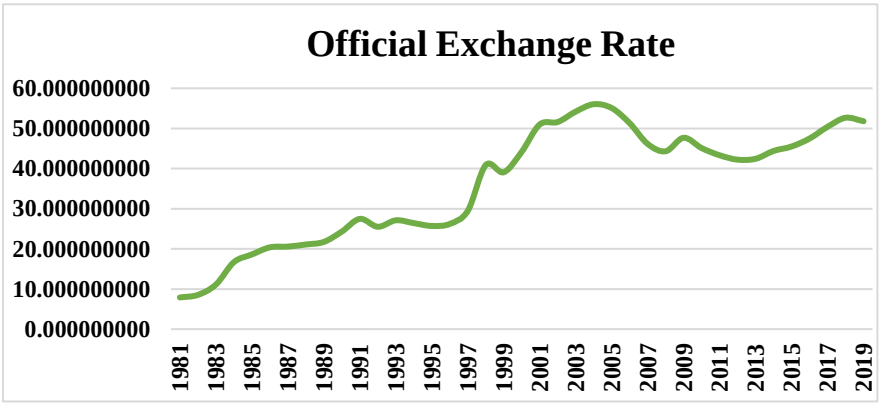


Figure 4.1.6 demonstrates the progression of the Philippine Gross Capital Formation from 1981 to 2019. As indicated in the table above, the Philippines' Gross Capital Formation has been declining since 1981 and has only begun to hike in 2011-2019.

The Philippines' 80's phase has been categorized as one of "debt-driven" growth in economic history. The 90-day moratoriums on principal repayments on foreign debt were issued in 1983, and the postponement negotiations were challenging, whereas the agreement with the country's private creditors did not fall until May 1985 (Dohner & Intal Jr., 1989). Consequently, between 1983 and 1986, per capita income plummeted by 18%.

The country's escalating economic plight, along with the rise of middle-class and corporate resistance to the government, aided in February 1986 ousting of Ferdinand Marcos. The Marcos administration generated a political-economic climate that inhibited independent investment, prompted capital flight, and subsequently crippled most of the productive sector. The Philippines' recent economic performance provides substantial reason to hope; Particularly between 1993 to 1998, when the Philippines outperformed the historical average when the ASEAN-3 states underperformed historical standards. According to data, the total revenue in

existence reached an all-time peak of 28.279 USD billion as Of December 2019 and a record low of 1.058 USD billion in March 1986.

Figure 4.1.6 **Philippine Gross Capital Formation (1981-2019)**

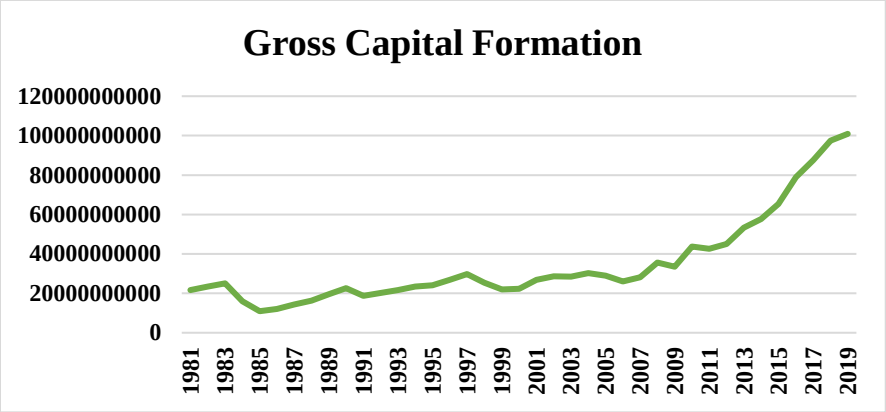


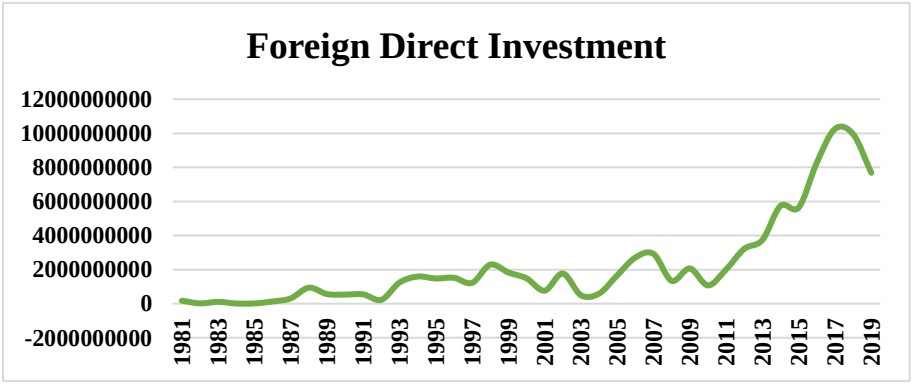
Figure 4.1.7 shows the growth of Philippine Foreign Direct Investment from 1981 to 2019. As shown in the table above, foreign direct investment in the Philippines has declined since 1981.

External borrowing in the Philippines increased dramatically since the early 1980s, and overall foreign debt almost doubled between 1979 and 1982. Borrowing grew as the current account deficit worsened, but capital flight also surged dramatically in the early 1980s, averaging 4.8 percent of GNP in 1981 and 1982. Net foreign direct investment inflows have slowed to a crawl as rising disinvestment has outweighed rising direct investment inflows (Kongsamut & Vamvadikis, n.d.).

In the country's FDI cases throughout the 1980s, external finance was crucial wherein economic growth largely depended on external factors. Based on arguments, foreign direct investments avoided the Philippines primarily because the domestic investment state under the Marcos administration became more unfavourable.

The country's investment share has been highly erratic, falling below the historical average in 1995. According to the calculations, increasing the Philippine investment contribution from 22% to 25% will contribute to 0.6% rapid growth. Foreign direct investment has a statistically significant beneficial impact on this growth. The Philippine FDI-to-GDP ratio has risen from 2% in 1995.

Figure 4.1.7 **Philippine Foreign Direct Investment (1981-2019)**



After the global economic downturn, the Philippine economy experienced a significant outflow of FDI. The early part of the 2000s was characterized by the persistence of the policies of economic liberalization. Despite global concerns in the early 2000s, the Philippine economy obtained significant resilience. Most of the progression in the 2000s was driven by increased private consumption expenditure, which was boosted significantly by remittances from overseas workers.

Moreover, the Philippines' foreign direct investment flows were recovering from 2016 to 2017 with a 46.82 and 23.88% increase correspondingly. However, between 2018-2019 the decline continued with 12.84 and 3% correspondingly (Macrotrends, n.d.).

4.2 Regression Results

In this section, the researchers aim to address the statement of problem number two until number 7. by presenting and analyzing the results from the OLS estimation. In addition, hypotheses testing results and diagnostic test results are discussed in the latter part of this section.

Table two, as presented below, is the summary of results from OLS estimation, which are divided into three panels. In Panel A, the coefficient and the individual significance of each regressor are presented. This panel entails the change of the regressand given a one-unit change in each regressor. Moreover, this panel also entails if the change caused by the regressors is significant or not. In Panel B, the goodness of fit of the model is presented; it entails the overall robustness of the model. And lastly, in Panel C, the diagnostic test is presented, which entails if the assumption of OLS regression is met.

Table 4.2.1. Summary table of Results

Panel A – OLS Estimates

Variable	Coefficient	Individual Significance (Prob.)
logEXPT	*0.540285*	*0.0000*
		(0.075053)
logIMPT	*-0.062177*	*0.5730*
		(0.109182)
logTRD	*-0.377120*	*0.0000*
		(0.041297)
logNUS	*0.084530*	*0.0099*
		(0.030841)
logRGCF	*0.239128*	*0.0002*
		(0.057072)
logFDI	*-0.033762*	*-0.4930*
		(0.005424)

Panel B – Coefficient Determination and Overall Significance

Number of Observations	*39*
R^2	*0.997105*
Adj. R^2	*0.996563*
F	*0.000000*

Panel C – Diagnostic Tests Results

Tests	***Results***
VIF	*logEXPT = 145.1682* *logIMPT= 377.4155* *logTRD = 4.570885* *log NUS= 13.41205* *log RGCF=50.93832* *logFDI = 4.525457*
Breush-Godfrey Serial Correlation LM	*1 lag = 0.0591* *2 lags =0.1227* *3 lags = 0.1384*
Breusch Pagan -Godfrey	*Prob Chi(Square) *0.2144*
Ramsey Reset	*Prob * 0.1224*
Jarque-Bera	*Prob * 0.006542*

Note: Standard Errors are in parathesis. VIF are Centered VIF values for each regressor.

4.2.1 Measuring the impact of the regressors on regressand.

In this subsection, the researchers discuss the coefficient of each regressor found in Panel A. Moreover, this subsection includes the discussion on the results of the individual significance of each regressor to the regressand found in the same panel. This section will address the second, third, fourth, fifth, sixth, and seventh objectives of the study, respectively.

In terms of Exports, the results suggest that a 1% increase in exports of goods and services will lead to a 0.54% increase in Real Gross Domestic Product. Moreover, since the p-value of exports is less than .05, the positive impact of exports of goods and services on Philippine economic growth is statistically significant. It follows that it meets the assumption given in table 3.3.1 and supports the findings of Angel et al. (2017), Okenna (2020), Eriksi (2019), and Nguyen (2020). Furthermore, it follows the findings of Raghutla (2020) that high-tech goods exports sectors have a significant impact on the national gross domestic product of nations that has a small sector of high-tech exports is applicable in the Philippine setting, and according to the foreign trade statistics of Philippines in 2016, (1) Electronic Products, (2) Other Manufactured Goods, (3) Machinery and Transport Equipment, (4) Wood Craft and furniture, (5) Ignition Wiring Set and Other Wiring set Used in Vehicles are the top five export commodities accounting for 68.5% of total exports. Thus, the result implies that Philippine exports contribute to the economic growth of the nation.

In terms of Imports, the result suggests that a 1% increase in imports of goods and services will lead to a 0.06% decrease in Real Gross Domestic Product. Furthermore, since the P-value of Imports given in Panel A is more than .05, the negative impact of Imports in goods and services is not statistically significant. It follows that it meets the assumption given in table 3.3.1 and supports the findings of Remond and Nasir (2020) that exports are more significant than imports. Moreover, the result implies that the Philippines being an import-based economy, is not effective as a driver of economic growth, but instead, it poses a threat to the nation's national income, thus limiting the import dependency ratio of the nation would help alleviate the negative impact.

In terms of Trade Openness, the results suggest that a 1% increase in Trade Openness (Percentage of trade in GDP) will lead to a 0.38% decrease in Real Gross Domestic Product. In addition, since the P-Value of trade openness given in panel A is less than .05, then the negative impact of trade openness on Philippine Economic growth is statistically significant. It follows that it does not meet the assumption given in table 3.3.1 and rejects the findings of Alam & Sumon (2019) and Keho (2017). Moreover, the negative trade balance for the past decade could explain the negative relationship between trade openness and the economic growth of the Philippines, which further emphasize the high import dependency ratio of the nation poses a threat and lead to the downturn of its economic growth.

In terms of Exchange rate, the results suggest that a 1% increase in the exchange rate will lead to a .08% increase in Real Gross Domestic Product. Moreover, since the P-Value of the exchange rate given in panel A is less than .05, then the positive impact of trade openness on Economic growth is statistically significant. It follows that it does not meet the assumption given in table 3.3.1 and supports the findings of Low & Chan (2017), Irsahd & Xin (2017), and rejects the findings of Karahan (2020), and Shu-Ping & Xiao-Meng (2017). Moreover, this implies that the depreciation of the currency has a positive impact on the Philippine economy. In addition, according to traditional views, the positive relationship of exchange rate and economic growth is rooted in the notion that exchange rate influences relative prices of domestic and foreign goods, which then promotes exports while decreasing imports and thus contributing to economic growth. From this standpoint, it could then again relate to the negative relationship between imports and the economic growth of the nation.

In terms of Gross Capital Formation, the results suggest that a 1% increase in Real gross Capital Formation will lead to a 0.24% increase in Real Gross Domestic Product. Additionally, since the P-Value of Gross Capital Formation given in Panel A is less than 0.05. then the positive impact of Gross Capital Formation on Economic growth is statistically significant. It follows that it meets the assumption given in table 3.3.1 and supports the findings of Altinoz et al. (2020), Ramaiah & Reddy (2020), Hakabwandi (2020), and Mansengesho & Ntamsza (2022). Moreover, the result implies that continuous capital accumulation contributes to Philippine Economic Growth.

Lastly, in terms of Foreign Direct Investments, the results suggest that a 1% increase in Foreign Direct Investment will lead to a 0.004% decrease in Real Gross Domestic Product. Additionally, the P-Value of Foreign Direct Investment given in Panel A is more than 0.05. Therefore, the negative impact of Foreign Direct Investments on Economic growth is statistically insignificant. It follows that it does not meet the assumption given in table 3.3.1 and supports the findings of Goh et al. (2017) and rejects the findings of Ridzuan et al. (2018), Stojanovic- Trivanovic (2017), and Dinh et al. (2019). Moreover, the result implies that the accumulation of foreign direct investment harms Philippine economic growth. It could be explained by the strong position of the private sector in the Philippines as accumulating FDI would crowd the sector and could result in dependency; therefore, limiting FDI would help the private sector of the nation to thrive on its own.

4.2.2 Goodness of fit

In Panel B, the R-squared and F-statistics of the model are presented. This shows the robustness and the overall statistical significance of the model. As presented in the table, the R-squared value is 0.997105, and this indicates that the variability of exports, imports, trade openness, exchange rate, gross capital formation, and FDI can explain 99.71% of the variability in real Gross Domestic Product in the Philippines. This demonstrates a strong constructed model since the observations that are fitted onto the model are over 80%. In addition, the p-value of F is below 0.05; therefore, the significance of regression function shows that the regressors Exports, Imports, Trade Openness, Exchange rate, Gross Capital Formation, and FDI have an impact on Real GDP – International trade has a significant impact on Philippine Economic Growth

4.2.3 Diagnostic tests

Given that the objectives of the study are met and addressed in the previous sections, it is important to know whether the model has encountered problems. This section ensures the validity and reliability of the results. It also helped justify the derived conclusion based on the discussions and figures mentioned in the previous sections. The researchers conducted five diagnostic tests: Variance inflationary factors (VIF) to test for Multicollinearity, Breush-Godfrey Serial Correlation to test for serial correlation, Breusch Pagan -Godfrey to test for Heteroscedasticity, Ramsey Reset test to test for Misspecifications, and Jarque-Bera to test for Normality Error.

As presented in Panel C, there is a presence of Multicollinearity in the model as seen some VIF values exceed 10, and this indicates that some of the regressors are interrelated. The researchers suspected that exchange rates and trade openness had caused multicollinearity since their relationship could be seen in the theory of the Balance of Payments. However, another diagnostic would be Data based on Multicollinearity since the date set used to represent imports, exports, and other regressors are taken under apportion of GDP. In addition, there are no misspecification issues found in the model, as the p-value of the Ramsey reset test seen in Panel C is more than .05. Therefore, the model is stable. With that being said, the researchers did not opt to exclude any of the regressors.

Moreover, there is no presence of serial correlation up to 1, 2, and 3 lags since the p-values of 1-3 lags of Breush-Godfrey Serial Correlation LM is more than 0.05. As for Heteroskedasticity, Breusch Pagan -Godfrey P-value is more than 0.05. The error terms are homoscedastic. On the other hand, the Jarque-Bera p-value is lower than .05. Therefore, the residual of the model is not normally distributed. However, since the study used a large number of observations (39), the normality error could not cause problems with the model (Ghasemi and Zahedias, 2012). Therefore, the researchers opted not to deal with the non-normality of the residuals.

5. Conclusions and Recommendations

5.1 Summary

This study explored the impact of international trade on Philippine Economic growth covering the period 1981 to 2019. The objectives of the study were achieved through employing Multivariate Ordinary Least Squares regression (with annual Real GDP as Regressand, and Exports, Imports, Trade Openness, Exchange rate, Gross Capital Formation, and Foreign Direct Investment as regressors). The significance of the parameters is tested through t-test and F-test (hypothesis testing), and diagnostic tests have been conducted to detect problems with the model. The findings of the study are the following: (1) Exports, Exchange rate, and Gross Capital formation have a positive impact on Philippine Economic Growth, while (2) Imports, Trade Openness, and Foreign Direct Investments have a negative impact on Philippine Economic Growth. (3) Exports, Trade Openness, Exchange rate, and Gross Capital formation have a significant impact on Philippine Economic Growth, while (4) Imports and Foreign Direct Investments have an insignificant impact on Philippine Economic growth, (5) Over-all International trade has a significant positive impact on Philippine Economic growth. In terms of diagnostic tests conducted in this study, certain diagnostics in the model were detected; (1) there is a presence of perfect multicollinearity and (2) non-normality in the residuals of the Model.

5.2 Conclusions

Given the findings presented in the previous chapter, the conclusions of the study were derived:

- One of the key findings is that the Philippine Exports and Gross capital formation has a positive and significant impact on economic growth. This supports the findings of previous literature. In addition, this supports the findings of Raghutla (2020) that high-tech goods export sectors influence a nation's gross domestic product through productivity and is felt intensely by nations with a small sector of high-tech export sectors, such as the Philippines. Therefore, expanding exports and continuous capital accumulation would greatly benefit the growth of the Philippine Economy.

- Another key finding in this study is that although Imports has an insignificant and negative impact on Philippine economic growth, the researchers still consider it as an important trade indicator due to its significant drawbacks, such as the devaluation of the peso, which significant and negatively affects the Philippine Trade Performance. Moreover, this relates

to the significant and negative influence of trade openness on economic growth since the Philippines has been experiencing trade deficits for the past decades. Therefore, Reducing the import dependency ratio of the nation would alleviate the adverse effects. Moreover, this also implies that the import-based strategy is not applicable in the Philippine setting.

- And lastly, the third key finding of this study is that foreign direct investment has an insignificant and negative impact on Philippine Economic Growth. The researchers think that this could potentially crowd domestic firms and affect the strong position of the private sector; therefore, monitoring this trade indicator would also help the Philippine private sector to thrive.

5.3 Recommendations

Given the diagnostics encountered by the researchers, some recommendations for future studies that can be considered in constructing the methodology of the study and might help to attain better results, and these recommendations are the following:

- One would be considering other indicators (data set) or variables that have a better fit in the model; this could address the perfect multicollinearity committed by the model in this study. However, the researchers also suggest trying a different method for estimation as this study only estimated using OLS regression, and since some of the indicators are linked to each other and such diagnostics are inevitable.
- As for the non-normality of error that occurred in the model, the researchers suggest transforming the data in its correct logarithmic form to avoid such problems. Moreover, the researchers would like to recommend using a large number of observations (30>), as this would deflect the diagnostics' adverse effects on the model.
- And lastly, the researchers also recommend incorporating other tests such as the unit root test and granger causality test to analyze if there is causality among the variables. This would also open an avenue for testing the co-integration of the model and explore more on the short and long-run relationships between the regressors and regressand.

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