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# Trade Deficit and Economic Growth: Policy Advice to 15 European Union Countries

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## Abstract

This paper investigates the relationship between GDP growth and imports from high income economies, low-to-medium income economies and the Arab World for 15 European Union countries having a trade deficit as of December 2021. To achieve this purpose, annual data for the periods between 1999 and 2019 was collected from the World Development Indicators database of the World Bank. The data was then analyzed via the Random Fixed Effects Model, using imports from high income economies, low-to-medium income economies and the Arab World as explanatory variables and GDP growth as the response variable while maintaining Capital Growth, Labor Force Growth and Technological Growth as control variables. The results of the analysis revealed that imports from high income economies had a positive relationship with GDP growth at 1% significance, while imports from low-to-medium income economies and Arab World had a negative relationship with GDP growth at 1% significance as well. The study shows that under the circumstance of trade deficits, imports decomposed into regions of origin can affect GDP growth differently. From this, we learn that trade deficit should not always carry a negative connotation until, at least, there has been some exploratory data analysis of the underlying information related to export and import. In this paper, it is successfully demonstrated how GDP is affected if/when imports are decomposed into regions of origin for 15 EU countries facing a trade deficit. It contributes to the ongoing policy discussions surrounding trade deficits in the EU. By analyzing the consequences of trade deficits and providing policy recommendations to address these issues, this paper will contribute to the development of effective policies that support the long-term economic growth and prosperity of the EU and its member states. The 15 countries covered in this paper include: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, France, Greece, Hungary, Latvia, Malta, Poland, Portugal, Romania, and Slovakia. These are countries there were reported by the European Union as having a trade deficit as of December 2021.

**Keywords**

Imports, Trade Deficit, Regression, GDP Growth, Policy

## 1. Introduction

The European Union (EU) is one of the largest trading blocs in the world, comprising 27 member states and a population of approximately 446 million people. As a result, trade has always been a critical aspect of the EU's economy. The EU's trade with the rest of the world is worth trillions of euros, with imports and exports accounting for a significant share of the bloc's GDP. However, over the past few years, several EU countries have experienced significant trade deficits that in turn affect their GDP growth negatively (Zemanek et al., 2010), despite the European Union as a whole reporting an aggregate trade surplus. This has raised concerns on the question of how these trade deficits are affecting the long-term growth (GDP) of the individual countries that register persistent trade deficits; with Belke and Dreger (2013) claiming that in the global debate on trade deficits, the European Union countries have not received much attention so far. They remarked that while the trade account is on balance for the EU area, divergences between individual member states have increased since the introduction of the common currency. This is why the question of how trade deficit affects GDP growth is interesting and needs to be investigated.

According to McNeill (1999), economic growth may be defined as the expansion of an economy's long-term capacity to produce goods and services, with the widely accepted measure of economic growth being the change in the level of real GDP in the economy over a given period.

A trade deficit, on the other hand occurs when a country imports more goods and services than it exports, resulting in a negative balance of trade. While a trade deficit can be the result of a strong economy that demands more imports, it can also be a sign of an uncompetitive or inefficient domestic industry, leading to a loss of jobs and a decrease in economic growth.

This paper therefore aims to provide policy advice to 15 EU countries facing trade deficits, with a particular focus on the relationship between trade deficit and economic growth. This will be done by analyzing panel data for the period 1999 to 2019. The countries included in this study are Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, France, Greece, Hungary, Latvia, Malta, Poland, Portugal, Romania, and Slovakia.

The paper is structured as follows: Introduction, Literature Review, Conceptual Framework, Methodology, Empirical Results and Summary, Conclusion and Policy Recommendations.

Finally, we will offer policy advice to the 15 EU countries facing trade deficits, providing recommendations for both short-term and long-term policy changes.

Understanding the relationship between imports and GDP growth is critical for

evaluating the role of trade in economic development. However, this relationship is inherently complex, as imports and GDP growth can influence each other in significant ways. For instance, while imports can drive growth by providing access to advanced technology and high-quality inputs, economic growth itself can increase demand for imports. This bidirectional relationship introduces potential endogeneity, which, if unaddressed, can lead to biased and unreliable estimates.

To overcome this challenge, this study employs an instrumental variable (IV) approach. By using external instruments that affect imports but are not directly related to GDP growth, this method isolates the causal impact of imports on economic performance. The adoption of this robust econometric framework ensures that the findings contribute meaningfully to the discourse on trade and growth dynamics.

In conclusion, this paper will contribute to the ongoing policy discussions surrounding trade deficits in the EU. By analyzing the consequences of trade deficits and providing policy recommendations to address these issues, this paper will contribute to the development of effective policies that will support the long-term economic growth and prosperity of the EU and its member states.

## 2. Literature Review

### 2.1. Theoretical Evidence

Trade deficit and economic growth are two important concepts in macroeconomics. A trade deficit occurs when a country imports more than it exports, resulting in a negative balance of trade. Economic growth, on the other hand, is a change in a country's Gross Domestic Product (GDP) over time. Debate on the relationship between trade deficit and economic growth is a regular feature around discussions on macroeconomic best practices among academic practitioners and policymakers in view of deciding the right course of action that can steer a country towards buoyancy. According to Ghosh and Ramakrishnan (2017), trade deficit and its relationship with economic growth reflect inherent macroeconomic trends that may be desirable or undesirable for a country at any given time. The potential to have a dual effect on a country makes the concept of trade deficit an important indicator due to its relationship with other indicators such that it is often at the heart of every global economic crisis (Sönmez & Yalçınkaya, 2017).

While some economists argue that trade deficit can have a negative relationship with economic growth, others strongly maintain that the relationship between trade deficit and economic growth is a positive one. On the one hand, Sahin and Mucuk (2014) and Tunian (2015) contend that trade deficit has a negative relationship with economic growth. A major reason for this is that a trade deficit implies the country under consideration is spending more money on imports than it is earning from exports. This can deplete the country's foreign exchange reserves and result in a decline in economic growth. This can be made worse, especially if domestic production and jobs are lost because companies can no longer compete with cheaper imports. Similarly, a study by Özer et al. (2018) found that trade

deficit has a negative relationship with economic growth in the short run, but no significant relationship in the long run.

On the other hand, Aydin and Esen (2016) found that a positive relationship exists between trade deficit and economic growth. This can be owed to the fact that a trade deficit can allow a country to import goods and services that it cannot produce domestically (Nyoni et al., 2017), leading to an increase in productivity and efficiency and hence economic growth.

Whichever side of the debate a researcher leans on will always have its root in the balance of payments theory. Propounded by Thirlwall (1997), it states that the relationship between trade deficit and economic growth can be negative or positive. The relationship can be positive if the deficit leads to a reduction in domestic production or investment as domestic firms may be forced to compete with cheaper imports. And it can be positive if the trade deficit is caused by increased imports of capital goods or raw materials that help stimulate economic activities.

### 2.2. Empirical Evidence

Many studies have used secondary/panel data to study the relationship between trade deficit and economic growth (Sahin & Mucuk, 2014; Tunian, 2015; Ahmad et al., 2017; Özer et al., 2018; Durmuş, 2019; Blavasciunaite et al., 2020; Ali, 2021; Aung, 2017; Rehman et al., 2021) and established that there is a negative relationship between the two entities. These studies used data over different time periods and had a common theme in their research question which sought to prob whether there was a relationship between trade deficit and economic growth. To answer the research question, they collected secondary data and used the Vector Error Correction Model and the Johansen co-integration technique as methodology to analyze the data and arrive at their findings.

One of the policy implications from these studies is that the government should implement trade policies that promote exports and reduce imports, such as increasing tariffs on imported goods or providing subsidies to exporters. This can help to reduce the trade deficit and increase economic growth by increasing exports and reducing imports. The second policy implication is that implementation of policies that promote domestic production and reduce reliance on imports. This can include policies to promote domestic industries, such as providing tax incentives for investment in certain sectors or providing funding for research and development to increase productivity.

Similar studies used secondary/panel data and to investigate the relationship between trade deficit and economic growth and found that there was a positive relationship between trade deficit and economic growth (Parikh, 2006; Velnampy & Achchuthan, 2013; Aydin & Esen, 2016; Ahmad et al., 2017; Nyoni et al., 2017; Shakil & Imran, 2022). These studies, like the previous ones, used data over different time periods and had a common theme too in their research question which sought to prob whether there was a relationship between trade deficit and economic growth. To answer the research question, they collected secondary data and

used different methodologies and models to analyze the data and arrive at their findings.

The first policy implication of these studies is that if the trade deficit is due to high level of imports of goods that could be produced domestically, policymakers may consider implementing protectionist measures (Aung, 2017) such as import tariffs or quotas to reduce the trade deficit. However, such measures could lead to trade tensions with trading partners and reduce the competitiveness of domestic industries. The second policy implication is that if the trade deficit is the result of structural weaknesses in the economy, such as a lack of competitiveness or a reliance on foreign borrowing to finance consumption or investment, then the positive relationship between trade deficit and economic growth may be a cause for concern. In this case, policymakers may need to take measures to address the underlying structural issues, such as improving productivity, promoting innovation, or reducing the reliance on foreign borrowing.

### 2.3. Contribution to Literature

This paper is similar to both groups of studies in the following ways:

1) They all use panel data for a period of at least 20 years collected from secondary sources.

2) They all use well known econometric and macroeconomic models to look at the relationship between trade deficit and economic growth with control variables.

The paper differs from both groups of studies in the following ways:

1) This paper uses a dataset and considers a time period that is different.

2) This paper uses the Solow growth model as the most appropriate model to address long-term growth, while the rest of the studies do not, except for Nyoni et al. (2017). As such, this paper uses control variables that are not used in both groups of studies.

While the previous studies used the difference between exports and imports to determine the relationship between trade deficit and economic growth, this paper brings a different approach by focusing on imports and decomposing the imports into regions of origin of the merchandise. My approach is better than what is in existing literature because of the following arguments:

1) It is using the full Solow growth model to define and apply the control variables of Capital Growth, Technological Progress and Labor Force Participation.

2) Decomposing imports into regions has basis in management literature and real-world applications such that every import transaction is part of a macro supply chain management function that is steered by the strategic decision-making process of a outsourcing manager. According to Maltz et al. (2011), the organizational outsourcing function plays the crucial role of evaluating and deciding whether a particular region or country is a good option from where to procure merchandise that minimizes total cost of ownership without compromising quality. This tells us that the parameters of region or country are at the heart of offshore outsourcing and procurement of goods that translate into imports using the

PESTEL analysis model (Helmold, 2019; Laitala, 2022). To the best of my knowledge, no paper has analyzed the relationship between trade deficit and economic growth from this perspective, hence its contribution to literature.

### 2.4. Conceptual/Theoretical Framework and Hypotheses Development

It is expected that the independent variable import, while controlling for Capital Growth, Labor Force Growth and Technological Growth, will have a negative relationship with GDP growth for the 15 countries with trade deficits considered for this study. This is because imports represent merchandise that are produced in other countries and procuring them necessitates an outflow of money from the importing country to the exporting country. When a country's imports exceed its imports, it means there is less money available to spend on domestic goods and services which can lead to a decrease in GDP growth. Conversely, when a country's imports decrease, it means more money is available to spend on domestic goods and services, which can lead to an increase in GDP growth.

The channel that establishes this relationship between trade deficit and economic growth is the balance of payment-constrained growth model; where the balance of payment is a record of all economic transactions between a country and the rest of the world over a specific period, including trade in goods and services, capital flows, and financial transfers. This demand-driven model studies long-run economic growth and contends that the major impediment/determinant of growth expansion and performance is the ratio of exports growth divided by income elasticity of imports (Thirlwall, 1997). This ratio is called the elasticity of trade and its critical in the study of international trade (Yilmazkuday, 2019) because, according to Shingil et al. (2022), the model addresses growth challenges caused by trade deficits arising from unfavorable terms of trade.

From studies conducted by Simonovska and Waugh (2011) to estimate trade elasticity ratio, it can be shown that if the ratio is greater than 1, it means that a given increase in exports will lead to a larger increase in imports. Conversely, if the ratio is less than one, this indicates that a given increase in exports will lead to a smaller increase in imports. For example, if a country's export growth is 5%, and the income elasticity of its imports is 2, the export elasticity of demand for imports would be 2.5 This means that a 1% increase in exports would lead to a 2.5% increase in imports. Based on this model, this paper argues that GDP growth is affected by Imports via the balance of payment growth model, while controlling for **Capital Growth**, **Labor Growth** and **Technological Growth**.

Following this argument, the hypothesis to be tested will be set up as follows:

H0: Imports from all regions have affected GDP growth negatively.

H1: Imports from all regions have not affected GDP growth negatively.

## 3. Methodology

### 3.1. Variable Description and Summary/Descriptive Statistics

Based on the variables identified above, the econometric model for this paper can

be presented as:

$$\textbf{GDP Growth} = \beta_0 + \beta_1(\text{LOG\_LABOR\_FORCE}) + \beta_2(\text{CAPITAL\_GROWTH}) + \beta_3(\text{RES\_AND\_DEV}) + \beta_4(\text{HIE}) + \varepsilon$$

where:

$\boldsymbol{\beta_0}$ is the constant term or intercept,

**LOG_LABOR_FORCE** is the Labor Force Growth,

**CAPITAL_GROWTH** is the Capital Growth Rate,

**RES_AND_DEV** is the Technology Growth Rate,

**HIE** is the proportion if import from High Income Economies,

$\boldsymbol{\varepsilon}$ is the error term of regression,

$\boldsymbol{\beta_1, \beta_2, \beta_3, \beta_4}$ are coefficients of the respective explanatory variables.

As pointed out in the literature review, the control variables of Labor Force Growth, Capital Growth and Technological Growth are evoked from the Solow model because the model proposes these three attributes as the foundation for understanding long term economic growth. In fact, in a cross-country panel data analysis on China's remarkable economic growth, Ding and Knight (2009) showed that the Solow model predicted China's economic growth rate rather accurately. Their result was given credence in a recent study to develop a simulation-dynamic model of long-term economic growth for the Russian economy by Boyko et al. (2019), who also used all three variables of the Solow model based on the Cobb-Douglas production function. They also established that the model predicted economic growth with a high degree of accuracy that gives the model a claim to universal application.

In their work to ascertain the relationship between trade deficit and economic growth, Sahin and Mucuk (2014) and Tunian (2015) also used imports as major explanatory variables to run their regressions.

To combine these four variables into a regression model, the functional form was determined from a theoretical and empirical standpoint. The functional form of a model defines the mathematical relationship between the response variable and the explanatory variables in the model. This form specifies how the independent variables are combined to obtain the predicted values of the response variable. When such a model has one dependent variable and more than one independent variable, it is called a multiple linear regression model (Uyanık & Güler, 2013), and in such models there is a simultaneous association of several variables with one continuous outcome (Eberly, 2007). Given that there is a known linear relationship between import and GDP growth while the other variables are linear in parameters as well as fulfil the characteristics described by (Uyanık & Güler, 2013) and (Eberly, 2007), a multiple linear regression model was the suitable choice. This is because it will identify the relationship between multiple independent variables and a dependent variable simultaneously; while picking out the factors that are most strongly associated with the dependent variable and to control for the effects of other variables.

From an empirical standpoint, several studies have been carried out on the

relationship between GDP growth and trade deficit with multiple linear regression as the preferred functional form, with conclusive evidence that the relationship between these variables and GDP growth is linear. For instance, Çetintaş and Barişik (2008) found that the relationship between GDP and economic growth was linear for a cross-section of transition economies in Asia, while Bakari and Mabrouki (2017) and Triyawan et al. (2021) arrived at the same conclusion for Panama and Canada respectively.

Now that the functional form of the model is known, it is important to discuss the anticipated sign of the coefficient of each variable. It is expected that the coefficients of the variables **LOG_LABOR_FORCE** (Labor Force Growth), **CAPITAL_GROWTH** (Capital Growth Rate) and **RES_AND_DEV** (Technology Growth Rate) will be positive, while the coefficients of the variables representing the economies from which imports are made will be negative. In this case, **HIE** (High Income Economies) and **LMIE** (Low-to-Medium Income Economies) and **ARAB_WORLD** (Arab World) which we will see in the methodology and analysis section.

**Variable Description and Summary/Descriptive Statistics**

For this research, panel data will be used to test the hypothesis and the data. The data is secondary data collected from the World Development Indicators database of the World Bank and the unit of measurement of all the variables are percentages calculated on dollar values of the transactions concerned. Data was collected per region designated by the World Bank as High Income Economies (**HIE,** countries with GNI per capita of $13,589), Low-to-Medium Income Economies (**LMIE,** countries with GNI per capita of between $1086 and $4255) and Arab World (**ARAB_WORLD**). Data for all 6 geographical regions classified as Low-to-Medium Income Economies were merged for ease of comparison. Before the merging, the 6 regions were given as per the summary statistics table: **E.ASIA_PACI** (East Asia and Pacific), **EUR_C.ASIA** (Europe and Central Asia), **LATAM_CARIB** (Latin America and Caribbean), **M.EAST_N.AFRI** (Middle East and North Africa), **S.ASIA** (South Asia), and **SUB.SAHARA** (Sub-Saharan Africa).

No index was created in setting up the data, so a summary statistics table of the variable was generated as bellow to provide a descriptive summary of the key characteristics of each variable, such as its mean, standard deviation, maximum and minimum values.

Table 1. Summary statistics table of variables for regression **GDP Growth** = $\beta_0$ + $\beta_1$(LOG_LABOR_FORCE) + $\beta_2$(CAPITAL_GROWTH) + $\beta_3$(RES_AND_DEV) + $\beta_4$(HIE) + ε.

| Statistic | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| GDP_GROWTH | 315 | 2.784 | 3.657 | −14.629 | 19.682 |
| ARAB_WORLD | 315 | 1.831 | 2.559 | 0.015 | 15.625 |

**Continued**

| | | | | | |
|---|---|---|---|---|---|
| HIE | 315 | 80.75 | 7.348 | 53.443 | 94.484 |
| E.ASIA_PACI | 315 | 5.05 | 2.097 | 0.582 | 11.318 |
| EUR_C.ASIA | 315 | 9.702 | 6.8 | 1.205 | 31.297 |
| LATAM_CARIB | 315 | 0.995 | 0.834 | 0.09 | 4.003 |
| M.EAST_N.AFRI | 315 | 1.451 | 2.276 | 0.012 | 14.095 |
| S.ASIA | 315 | 0.671 | 0.466 | 0.132 | 2.601 |
| SUB.SAHARA | 315 | 0.756 | 1.137 | 0.005 | 8.87 |
| LOG_LABOR_FORCE | 315 | 6.508 | 0.562 | 5.188 | 7.487 |
| CAPITAL_GROWTH | 315 | 3.43 | 11.41 | −37.196 | 62.308 |
| RES_AND_DEV | 315 | 1.103 | 0.726 | 0.218 | 3.16 |
| LMIE | 315 | 18.625 | 7.195 | 5.46 | 46.46 |

According to Table 1, the variables can be interpreted as such:

**GDP_GROWTH:** This variable has a mean of 2.784 and standard deviation of 3.657, meaning the 15 countries experienced an average growth rate of 2.784% and there is a wide range of GDP growth among the countries. The maximum value of 19.682 indicates that the highest observed GDP growth rate was nearly 20%, while the minimum value of −14.629 indicates that the lowest observed GDP growth was a decline by nearly 15%.

**ARAB_WORLD:** The variable has a mean value of 1.831 and standard deviation of 2.559, indicating that on average, 1.831% of the total imports by these 15 countries came from the Arab World, and there is a significant variation in the percentage of imports from the Arab World. The minimum value is 0.015 indicates that the smallest proportion of imports from the Arab World was 0.015% and the maximum proportion of imports from the Arab World was 15.625%.

**HIE:** This variable has a mean of is 80.750 and a standard deviation of 7.348, indicating that on average, about 80.750% of the total imports for these 15 countries came from High Income Economies and there is variation in the proportion of imports from High Income Economies. The minimum value is 53.443 and the maximum value is 94.484; indicating the lowest proportion of total imports from High Income Economies was 53.443% while the highest was 94.484%.

**LOG_LABOR_FORCE:** This variable on the log scale has a mean of 6.508 and standard deviation of 0.562, indicating the 15 countries have an average labor force participation of close to 7 on the log scale and this level of labor force is clustered around the mean. The minimum value of 5.188 indicates that the lowest observed level of labor force participation was just over 5 on the log scale, while the maximum value of 7.487 indicates that the highest observed level of labor force participation was just under 7.5.

**CAPITAL_GROWTH:** This variable has a mean of 3.430, indicating that the countries experienced an average capital growth of 3.4% and a standard deviation of 11.410 means there is a wide range of capital growth rates among the countries. The minimum value of −37.196 indicates that the lowest observed capital growth

rate was −37% (highest decline), while the maximum value of 62.308 indicates that the highest observed capital growth rate was 62%.

**RES_AND_DEV:** This variable has a mean of 1.103, indicating that the countries on average allocated the equivalent of 1.103% of their GDP to research and development expenditure. The standard deviation of 0.726 indicates that the levels of spending on research and development are relatively tightly clustered around the mean. The minimum value of 0.218 indicates that the lowest observed level of spending on research and development was just over 0.2% of GDP, while the maximum value of 3.160 indicates that the highest observed level of spending on research and development was just over 3%.

**LMIE:** This variable has a mean of 18.625 and a standard deviation of 7.195, meaning on average, 18.625% of imports came from Low-to-Medium Income Economies with significant variations. The minimum value of 5.460 and maximum value of 46.460 respectively indicate the lowest and highest proportion of imports from Low-to-Medium Income Economies.

## 3.2. Estimation Strategy/Technique

The Fixed Effects Model and Random Effect Model were developed, and the Random Effects Model selected as the appropriate model based on the results of a Hausman Test. A multicollinearity test was also conducted using the Variance Inflation Factor method to ensure that none of the independent variables were related in any way. The results are in Table 2.

Table 2. Fixed effects model and random effect model compared.

| | Dependent Variable: | | | |
|---|---|---|---|---|
| | GDP_GROWTH | | | |
| | Fixed Effect (1) | | Random Effect (2) | |
| LOG_LABOR_FORCE | −1.749 | (5.534) | −0.027 | (0.305) |
| CAPITAL_GROWTH | 0.205*** | (0.013) | 0.209*** | (0.013) |
| RES_AND_DEV | −1.477** | (0.622) | −1.133*** | (0.247) |
| HIE | 0.072* | (0.042) | 0.096*** | (0.023) |
| Constant | | | −4.253 | (3.042) |
| Observations | 315 | | 315 | |
| R-Squared | 0.462 | | 0.498 | |
| Adjusted R-Squared | 0.429 | | 0.492 | |
| F Statistic | 63.439*** | (df = 4; 296) | 308.025*** | |
| Note: | *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$ | | | |

**Hausman Test**

H0: corr(αi, xi = 0); That is, Random Effect Model is appropriate for the data

H1: corr(αi, xi!= 0); That is, Fixed Effect Model is appropriate for the data

**Hausman Test**

data: GDP_GROWTH ~ LOG_LABOR_FORCE + CAPITAL_GROWTH + RES_AND_DEV + ...

chisq = 3.3046, df = 4, *p*-value = 0.5082

alternative hypothesis: one model is inconsistent.

From the Hausman test, the *p*-value is greater than 0.05, so we do not reject the null hypothesis and therefore use the Random Effect Model for the regression (Table 3).

Table 3. Multicollinearity test.

| LOG_LABOR_FORCE | CAPITAL_GROWTH | RES_DEV | HIE |
|---|---|---|---|
| 1.357254 | 1.004987 | 1.482587 | 1.318005 |

## 3.3. Diagnostic/Specification Tests

The decision to use the Hausman Test to choose between fixed-effects and random-effects models was made based on factors, including the research question, the nature of the data, and the theoretical and empirical assumptions of the underlying two models. Fixed-effects models assume that the individual-specific effects are uncorrelated with the explanatory variables, while random-effects models assume that the individual-specific effects are correlated with the explanatory variables.

One challenge in analyzing the relationship between GDP growth and the explanatory variables in this model is the possibility of endogeneity. This arises from two main concerns:

1) Reverse Causality: The explanatory variables might be influenced by GDP growth, creating a feedback loop. For example, economic growth may lead to increases in the labor force or capital growth, as more opportunities arise, or it may affect the demand for imports from high-income economies.

2) Omitted Variable Bias: There may be other factors not included in the model that simultaneously affect both GDP growth and the explanatory variables. For instance, factors such as policy changes, external shocks, or global market trends might influence both the growth of the labor force and capital accumulation, as well as imports from high-income economies.

Although the analysis does not employ specific techniques to address endogeneity, such as instrumental variables or lagged variables, several steps were taken to reduce its potential impact:

- Control Variables: The model includes key variables, such as labor force growth, capital growth, and technology growth, which are likely to have an independent effect on GDP growth. By controlling for these factors, the model attempts to isolate the effect of each variable, including HIE, on GDP growth.
- Model Specification: The regression model was specified according to economic theory, ensuring that the relationship between GDP growth and the explanatory variables reflects both theoretical considerations and empirical observations.

While these steps help to reduce potential biases, the absence of a direct method to address endogeneity means that the results should be interpreted as indicative of correlations rather than causal relationships. Reverse causality and omitted variable bias could still confound the estimates. Future research could employ more advanced econometric techniques, such as instrumental variable methods or dynamic panel data models, to better address these concerns and clarify the causal effects.

## 4. Empirical Results

### 4.1. Data Visualization

Prior to running the regression, it was necessary to visualize the data characteristics of the variables to have an idea of their behavior (Figures 1-4).

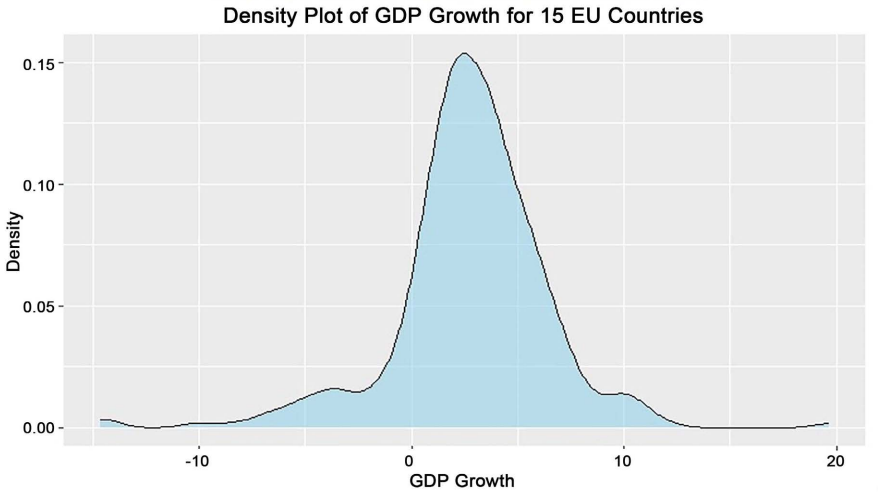


Figure 1. GDP growth rate is normally distributed, with the majority of the data points clustered around the mean.

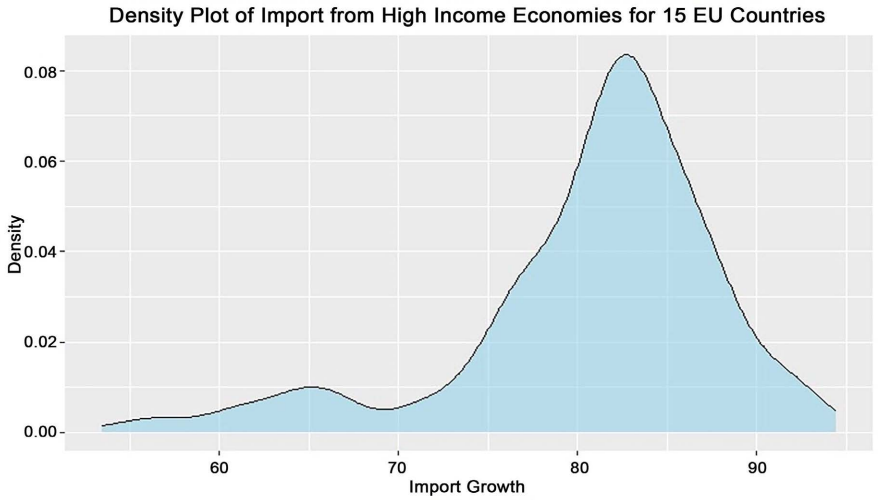


Figure 2. Import from High Income Economies is left-skewed; the majority of the data points are clustered to the right with the median and mode greater than the mean.

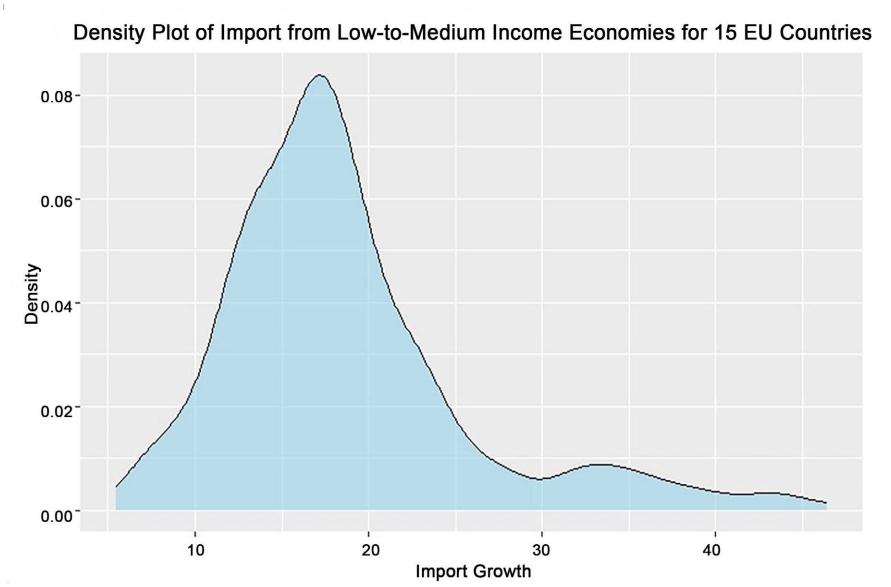


Figure 3. Import from Low-to-Medium Income Economies is right-skewed; the majority of the data points are clustered to the left with the median and mode less than the mean.

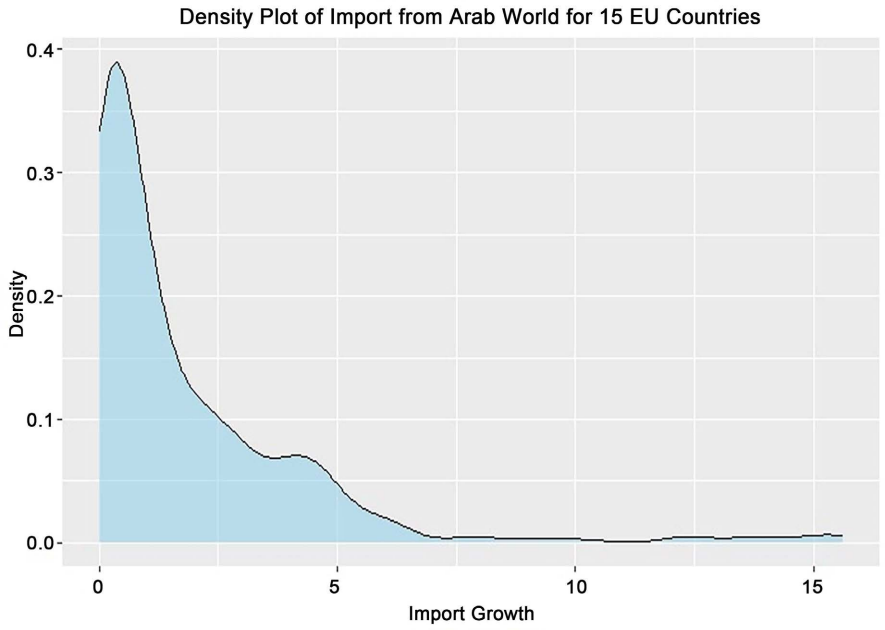


Figure 4. Import Arab World is right-skewed; the majority of the data points are clustered to the left with the median and mode less than the mean.

## 4.2. Regression Results Analysis

Having selected the Random Effects Model, it was used to run a regression on import from each of High Income Economies (HIE), total import from Low-to-Medium Income Economies (LMIE) and import from the Arab World (ARAB_WORLD) as the explanatory variables and GDP Growth as the response variable, with the following results (Figures 5-7):

| Dependent Variable: | | |
|---|---|---|
| GDP_GROWTH | | |
| Effect of Merchandise Import from High Income Economies | | |
| LOG_LABOR_FORCE | −0.027 | (0.305) |
| CAPITAL_GROWTH | 0.209*** | (0.013) |
| RES_AND_DEV | −1.133** | (0.247) |
| HIE | 0.096*** | (0.023) |
| Constant | −4.253 | (3.042) |
| Observations | 315 | |
| R-Squared | 0.498 | |
| Adjusted R-Squared | 0.492 | |
| F Statistic | 308.025*** | |
| Note: | $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ | |

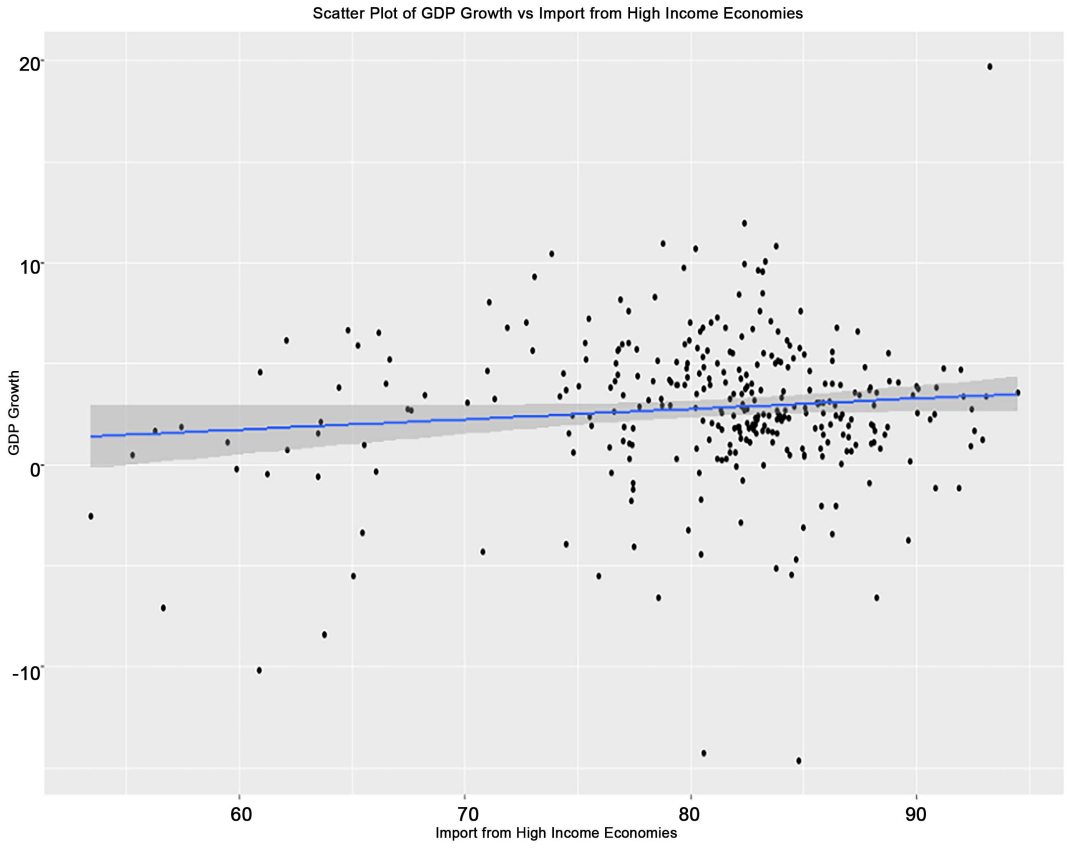


**Figure 5.** Scatterplot of GDP growth vs import from high income economies.

The results above (**Figure 5**) indicate that imports from High Income Economies (HIE) have a positive and statistically significant effect on GDP growth for all 15 countries facing trade deficit, with a coefficient of 0.096 and a $p$-value of less than 0.01 and even a positive slope. This means that increasing imports from High

Income Economies by 1% will lead to an increase in GDP by 0.096%.

| Dependent Variable: | | |
|---|---|---|
| GDP_GROWTH | | |
| Effect of Merchandise Import from Low-to-Medium Income Economies | | |
| LOG_LABOR_FORCE | 0.049 | (0.309) |
| CAPITAL_GROWTH | 0.208*** | (0.013) |
| RES_AND_DEV | −1.140*** | (0.245) |
| LMIE | −0.102*** | (0.024) |
| Constant | 4.915*** | (1.788) |
| Observations | 315 | |
| R-Squared | 0.501 | |
| Adjusted R-Squared | 0.494 | |
| F Statistic | 310.710*** | |
| Note: | $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ | |

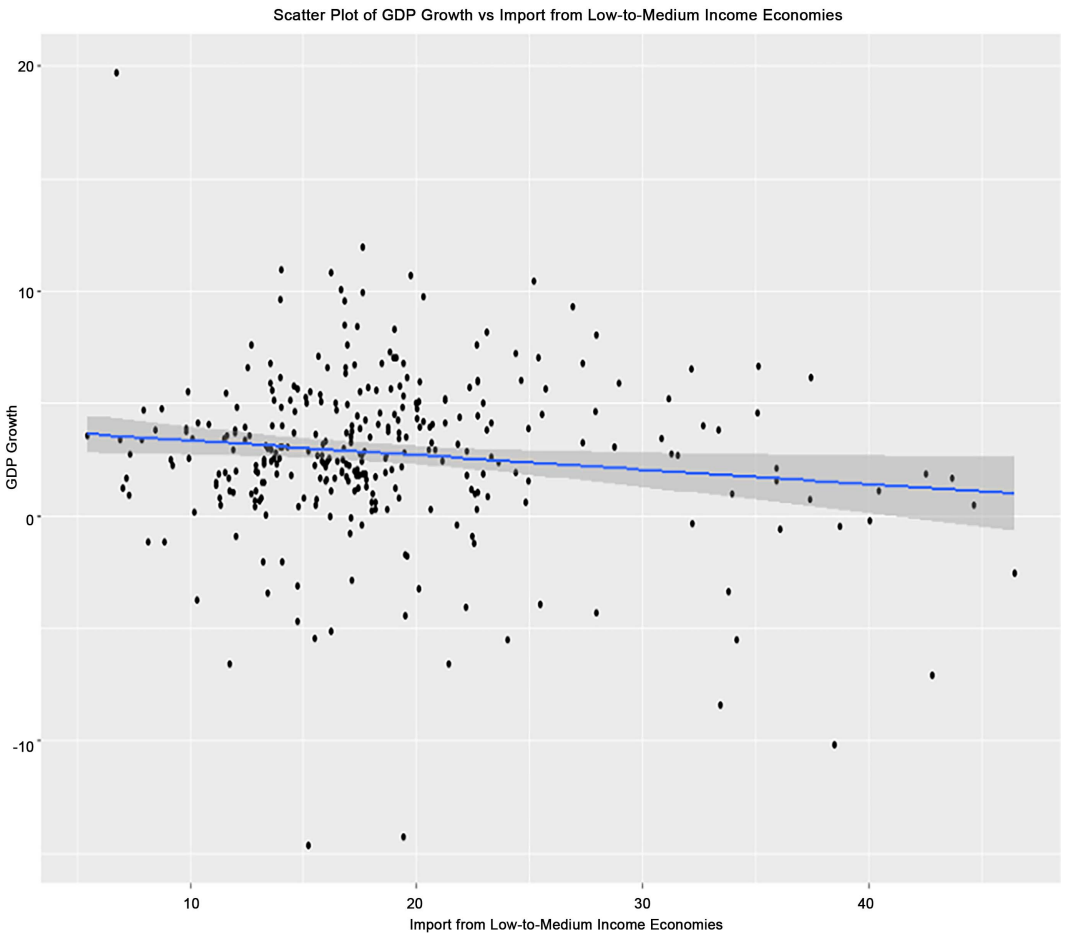


**Figure 6.** Scatterplot of GDP growth vs import from low-to-medium income economies.

The results (Figure 6) indicate imports from Low-to-Medium Income Economies (LMIE) have a negative and statistically significant effect on GDP growth for all 15 countries facing trade deficit, with a coefficient of −0.102 and a $p$-value of less than 0.01 and even a negative slope. This means that increasing imports from Low-to-Medium Income Economies by 1% will decrease GDP by 0.102%.

| Dependent Variable: | | |
|---|---|---|
| GDP_GROWTH | | |
| Effect of Merchandise Import from Arab World | | |
| LOG_LABOR_FORCE | −0.395 | (0.310) |
| CAPITAL_GROWTH | 0.202*** | (0.013) |
| RES_AND_DEV | −0.680*** | (0.236) |
| ARAB_WORLD | −0.165*** | (0.063) |
| Constant | 5.712*** | (1.936) |
| Observations | 315 | |
| R-Squared | 0.479 | |
| Adjusted R-Squared | 0.472 | |
| F Statistic | 284.845*** | |
| Note: | *$p$ < 0.1; **$p$ < 0.05; ***$p$ < 0.01 | |

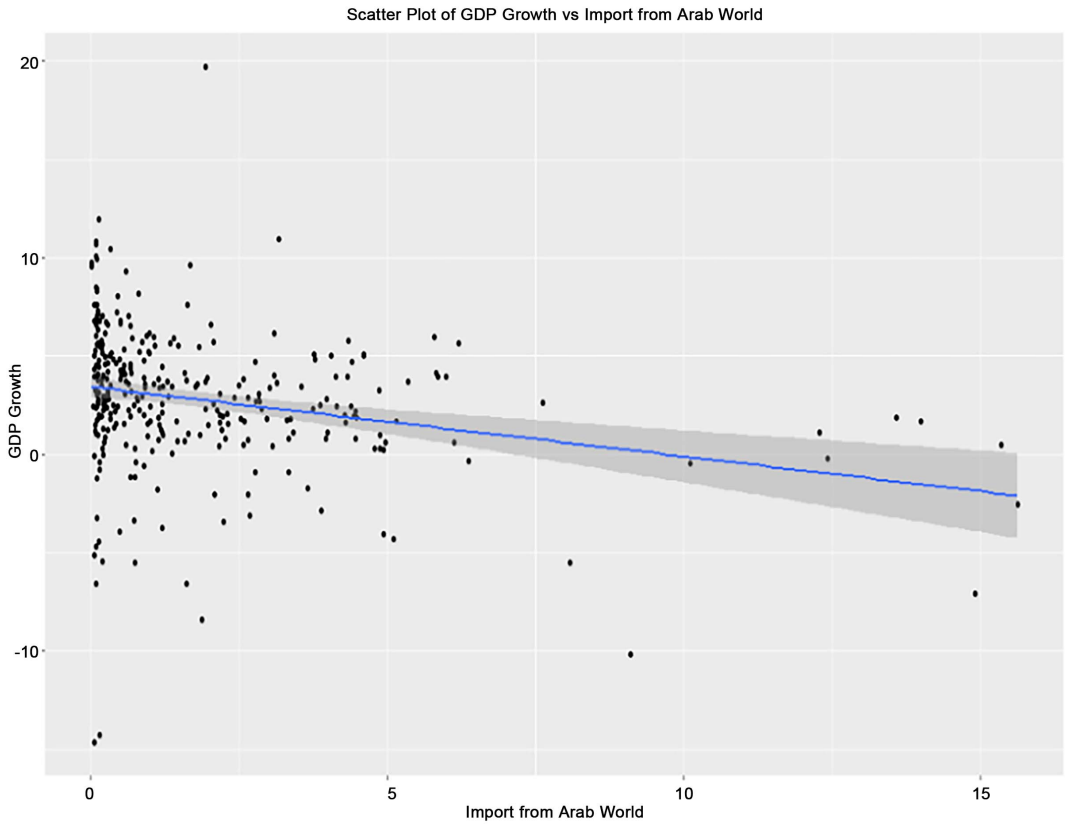


Figure 7. Scatterplot of GDP growth vs import from Arab world.

The results (Figure 7) indicate imports from the Arab World have a negative and statistically significant effect on GDP growth for all 15 countries facing trade deficit, with a coefficient of −0.165 and a *p*-value of less than 0.01 and even a negative slope. This means that increasing imports from the Arab World by 1% unit will decrease GDP by 0.165%.

### 4.3. Results Pertaining to Control Variables

From the three regressions, it is observed that coefficient of the variable CAPITAL_GROWTH (Capital Growth) has been consistently positive and statistically significant. This means that capital growth has had a steady positive impact on economic growth for all 15 countries. Meanwhile, it is also observed that the coefficient of the variable RES_AND_DEV (Technological Growth) has been consistently negative and statistically significant. This means that technological growth has had a steady negative impact on economic growth for all 15 countries. As for the LOG_LABOR_FORCE (Labor Force Growth) variable, it has been consistently negative but with no statistical significance to affect GDP growth.

Discussion, Limitations and Future Extensions

The regression results provide answers to the research question by revealing that the regions have affected economic growth differently, positively in one case and negatively in two cases. As a result, the null hypothesis is rejected.

Imports from High Income economies brought positive impact to economic growth while imports from Low-to-Medium Economies and Arab World brought negative impacts to economic growth. This agrees with literature that a trade deficit can have either a positive or negative impact or both when import provenance is decomposed like in this research. The extent or magnitude of this impact can be seen in the regression coefficients of the regions to contextualize the objective of this research.

With a regression coefficient of −0.165, the Arab world has the most negative impact on economic growth while High Income Economies have the most positive impact with a regression coefficient of 0.096. Low-to-Medium Income Economies also have a negative impact on economic growth with a regression coefficient of −0.102 that corresponds to 62% of the impact of Arab World.

## 5. Summary, Conclusion and Policy Recommendations

The analysis of GDP growth in 15 European Union countries facing a trade deficit has revealed key insights into how imports from different regions influence economic growth. Specifically, capital goods, which are among the top imports from High Income Economies (HIE), have a positive contribution to economic growth through capital creation, as reflected by a statistically significant coefficient of 0.2. However, the consistently negative and statistically significant coefficient for Research and Development (R&D) suggests that investment in technology has not been translating effectively into economic benefits, thereby neutralizing the positive impact of imports from High Income Economies.

Policy Recommendations:

1) Promote R&D and Technology Commercialization:

- **Action:** Accelerating the conversion of R&D investments into commercially viable products and services by promoting policies such as R&D Tax Credits, providing Regulatory Support for new technologies, and fostering Academia-Industry Alliances.
- **Stakeholders:** Governments, private sector businesses, academic institutions, and research organizations.
- **Implementation:** Policymakers can introduce financial incentives such as tax rebates for companies investing in R&D and technological development. Regulatory frameworks should be designed to encourage innovation while ensuring safety and sustainability. Strengthening the collaboration between academia and industry will help bridge the gap between research output and market applications.
- **Outcome:** These actions would reduce reliance on imports from High Income Economies and Low-to-Medium Income Economies while enhancing local manufacturing capacity, fostering competition, and boosting exports.

2) Promote Diversification of Energy Sources:

- **Action:** Encouraging policies to reduce reliance on crude and refined oil imports from the Arab World by investing in alternative energy sources and incentivizing electric vehicle (EV) adoption.
- **Stakeholders:** Governments, energy companies, automobile manufacturers, and consumers.
- **Implementation:** Policymakers should promote the development of renewable energy infrastructure, including solar, wind, and bioenergy, through subsidies and grants for both research and infrastructure projects. Additionally, incentives for EV adoption—such as tax rebates, reduced tariffs, and infrastructure development (e.g., charging stations)—can significantly reduce oil dependency.
- **Outcome:** These measures would mitigate the negative impact of oil price volatility, reduce currency depreciation due to oil imports, and enhance energy security while fostering sustainable economic growth.

This study has demonstrated the differential impact of imports decomposed by region on GDP growth for 15 EU countries facing trade deficits. Imports from High Income Economies have a positive relationship with GDP growth, while imports from Low-to-Medium Income Economies are negatively correlated. This highlights that trade deficits do not necessarily indicate economic harm, especially if the composition of imports is favorable. The findings suggest that a deeper examination of imports and exports is crucial before drawing conclusions about the overall health of an economy.

The model explains approximately 50% of the variation in GDP growth, which suggests that there are numerous other factors influencing economic performance. While this R-squared value may seem modest, it reflects the complex and

multifaceted nature of economic growth. Future research could consider additional control variables, such as Savings, Unemployment, Inflation, Human Development Index, and Gross National Income, to enhance model accuracy and provide a more comprehensive understanding of the forces driving economic growth.

By implementing the recommended policies, policymakers can create a more resilient economy that is better equipped to manage trade deficits and foster sustainable growth. Additionally, further research into the inclusion of other relevant economic indicators could provide a clearer picture of the dynamics of GDP growth in the context of international trade.

This analysis sheds light on the relationship between GDP growth and key explanatory variables, including labor force growth, capital growth, technology growth, and the proportion of imports from high-income economies. However, it is important to acknowledge the potential issue of endogeneity, which has not been directly addressed in this study. Reverse causality and omitted variables might still influence the results. Future studies could use advanced econometric techniques, such as instrumental variables or lagged models, to improve the robustness of the findings and explore the causal relationships more thoroughly.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

## References

Ahmad, R., Raza, K., & Saher, S. (2017). Impact of Trade Openness on Economic Growth: A Case Study of Pakistan. *Review of Economics and Development Studies, 3,* 57-68. https://doi.org/10.26710/reads.v3i1.165

Ali, A. A. (2021). Trade Deficit and Economic Growth: Using ARDL Technique for the Economy of Pakistan. *International Journal of Business and Management Sciences, 2,* Article 3.

Aung, W. T. (2017). Relationship between Trade Deficit and Economic Growth. Master's Thesis, KDI School.

Aydin, C., & Esen, Ö. (2016). The Threshold Effects of Current Account Deficits on Economic Growth in Turkey: Does the Level of Current Account Deficit Matter? *International Journal of Trade, Economics and Finance, 7,* 186-193. https://doi.org/10.18178/ijtef.2016.7.5.520

Bakari, S., & Mabrouki, M. (2017). The Effect of Agricultural Exports on Economic Growth in South-Eastern Europe: An Empirical Investigation Using Panel Data. *Journal of Smart Economic Growth, 2,* Article 4.

Belke, A., & Dreger, C. (2013). Current Account Imbalances in the Euro Area: Does Catching Up Explain the Development? *Review of International Economics, 21,* 6-17. https://doi.org/10.1111/roie.12016

Blavasciunaite, D., Garsviene, L., & Matuzeviciute, K. (2020). Trade Balance Effects on Economic Growth: Evidence from European Union Countries. *Economies, 8,* Article 54. https://doi.org/10.3390/economies8030054

Boyko, A. A., Kukartsev, V. V., Tynchenko, V. S., Eremeev, D. V., Kukartsev, A. V., &

Tynchenko, S. V. (2019). Simulation-Dynamic Model of Long-Term Economic Growth Using Solow Model. *Journal of Physics: Conference Series, 1353,* Article ID: 012138. https://doi.org/10.1088/1742-6596/1353/1/012138

Çetintaş, H., & Barişik, S. (2009). Export, Import and Economic Growth: The Case of Transition Economies. *Transition Studies Review, 15,* 636-649. https://doi.org/10.1007/s11300-008-0043-0

Ding, S., & Knight, J. (2009). Can the Augmented Solow Model Explain China's Remarkable Economic Growth? A Cross-Country Panel Data Analysis. *Journal of Comparative Economics, 37,* 432-452. https://doi.org/10.1016/j.jce.2009.04.006

Durmuş, A. (2019). Economic Growth and Trade Deficit in Turkey. *Journal of Social Sciences and Education, 2,* Article 1.

Eberly, L. E. (2007). Multiple Linear Regression. In W. T. Ambrosius (Ed.), *Methods in Molecular Biology™* (pp. 165-187). Humana Press. https://doi.org/10.1007/978-1-59745-530-5_9

Ghosh, A., & Ramakrishnan, U. (2017). Current Account Deficits: Is There a Problem? There Can Be Consequences When the Amount a Country Spends Abroad Is Wildly Different from What It Receives from the Outside World. *Finance & Development, 5,* 10.

Helmold, M. (2019). Tools in PM. In M. Helmold (Ed.), *Progress in Performance Management* (pp. 111-122). Springer. https://doi.org/10.1007/978-3-030-20534-8_8

Laitala, E. (2022). *How to Expand Business to China.* https://www.theseus.fi/bitstream/handle/10024/744434/Laitala_Emmi.pdf?sequence=2

Maltz, A., Carter, J. R., & Maltz, E. (2011). How Managers Make Sourcing Decisions about Low Cost Regions: Insights from Perceptual Mapping. *Industrial Marketing Management, 40,* 796-804. https://doi.org/10.1016/j.indmarman.2011.01.003

McNeill, J. (1999). *GDP Growth and Human Wellbeing: A Brief Look at Why We Need a Better Measure of Progress.*

Nyoni, T., Musisinyani, B., & Nyoni, M. (2017). *The Impact of Current Account Deficits on Economic Growth in Zimbabwe (SSRN Scholarly Paper No. 3051008).* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3051008

Özer, M., Žugić, J., & Tomaš-Miskin, S. (2018). The Relationship between Current Account Deficits and Growth in Montenegro: ARDL Bounds Testing Approach. *Journal of Central Banking Theory and Practice, 7,* 5-24. https://doi.org/10.2478/jcbtp-2018-0020

Parikh, A. (2006). Relationship between Trade Liberalization, Growth, and Balance of Payments in Developing Countries: An Econometric Study. *The International Trade Journal, 20,* 429-467. https://doi.org/10.1080/08853900600941092

Rehman, S. U., Taqi, M., Rahman, S. U., & Ahmad, W. (2021). Impact of Trade Deficit on Economic Growth: A Case of Some Selected Countries. *International Research Journal of Management and Social Sciences, 2,* 27-39. https://doi.org/10.53575/irjmss.v2.2(21)3.27-39

Sahin, I. E., & Mucuk, M. (2014). The Effect of Current Account Deficit on Economic Growth: The Case of Turkey. In *11th International Academic Conference* (pp. 321-329). https://ideas.repec.org/p/sek/iacpro/0301828.html

Shakil, A., & Imran, K. (2022). The Impact of Globalization, Foreign Direct Investment and Trade Openness on Poverty: A Case Study of Pakistan. *Economic Consultant, 37,* 41-60. https://doi.org/10.46224/ecoc.2022.1.4

Shingil, M. E., Ozdeser, H., & Saliminezhad, A. (2022). Investigation of Balance of Payment Constrained Growth Model: The Impact of Export Growth, Capital Flows, and Real

Effective Exchange Rate on Growth of the Uk. *Sage Open, 12,* 1. https://doi.org/10.1177/21582440221085011

Simonovska, I., & Waugh, M. E. (2011). The Elasticity of Trade: Estimates and Evidence. *Journal of International Economics, 92,* 34-50.

Sönmez, E. F., & Yalçınkaya, H. (2017). *The Relationship between Current Account Deficit and Economic Growth: Panel Causality Analysis* (pp. 1-15). https://www.researchgate.net/profile/Filiz-Eratas-Soenmez/publication/323586276_The_Relationship_Between_Current_Account_Deficit_and_Economic_Growth_Panel_Causality_Analysis/links/5a9ef1f80f7e9badd99e7b2e/The-Relationship-Between-Current-Account-Deficit-and-Economic-Growth-Panel-Causality-Analysis.pdf

Thirlwall, A. P. (1997). Reflections on the Concept of Balance-of-Payments-Constrained Growth. *Journal of Post Keynesian Economics, 19,* 377-385. https://doi.org/10.1080/01603477.1997.11490117

Triyawan, A., Latifa, H., Seriki, L. L., & Alfaqeeh, A. (2021). Influence of Export and Import Toward Economic Growth in Canada in 2010-2019. *Fokus Ekonomi: Jurnal Ilmiah Ekonomi, 16,* Article 2.

Tunian, A. (2015). Current Account Deficit and Economic Growth in Armenia. *Studies and Scientific Researches. Economics Edition, 21,* 64. https://doi.org/10.29358/sceco.v0i21.299

Uyanık, G. K., & Güler, N. (2013). A Study on Multiple Linear Regression Analysis. *Procedia—Social and Behavioral Sciences, 106,* 234-240. https://doi.org/10.1016/j.sbspro.2013.12.027

Velnampy, T., & Achchuthan, S. (2013). Fiscal Deficit and Economic Growth: A Study on Sri Lankan Economic Perspective. *Developing Country Studies, 3,* 166-174.

Yilmazkuday, H. (2019). Estimating the Trade Elasticity over Time. *Economics Letters, 183,* Article ID: 108579. https://doi.org/10.1016/j.econlet.2019.108579

Zemanek, H., Belke, A., & Schnabl, G. (2010). Current Account Balances and Structural Adjustment in the Euro Area. *International Economics and Economic Policy, 7,* 83-127. https://doi.org/10.1007/s10368-010-0156-x