

## Growth Dynamics: a Comparative Analysis Between Indonesia and the United States

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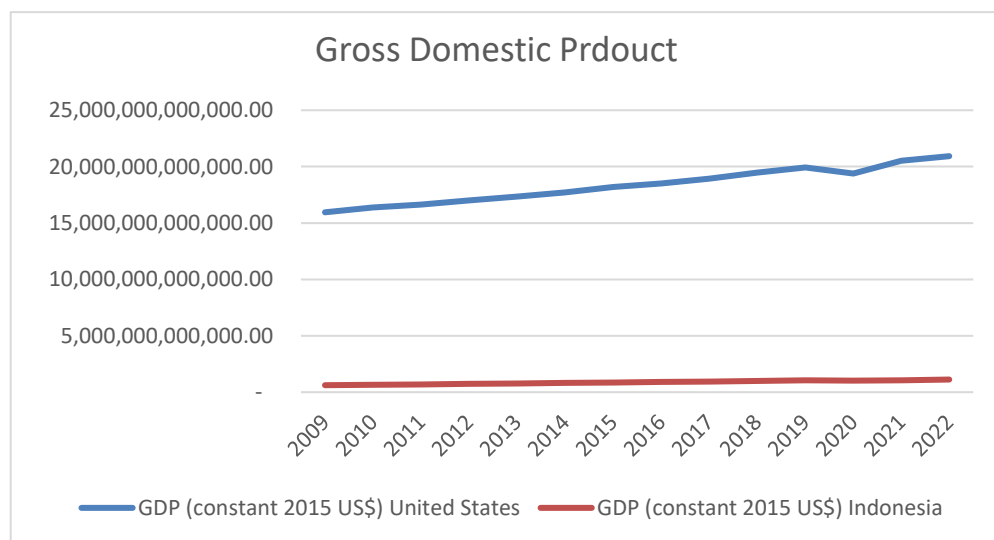
### ABSTRACT

This study aims to identify the discriminant factors that distinguish the Gross Domestic Product (GDP) between Indonesia and the United States. Using discriminant analysis method, this study explores the economic variables that contribute to the difference in economic performance of the two countries. The main focus of this analysis is to determine the extent to which variables such as per capita income, exports of goods and services, exports of ICT goods, unemployment with continuing education, manufacturing exports, government spending on education can predict and differentiate the GDP of the two countries. The results showed that there are four significant variables that distinguish the Gross Domestic Product (GDP) between Indonesia and the United States. These variables are national income per capita, export of Information and Communication Technology (ICT) goods, export of manufactured goods, and expenditure on education. Therefore, the government can focus on these variables in order to improve the economy in indonesia.

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## INTRODUCTION

Economic growth is one of the important indicators that indicate the economic health of a country. According to (Todaro & Stephen, 2003) economic growth can be defined as a long-term increase in the ability of a country to provide more and more types of economic goods to its population. Economic growth of a country is often judged by the amount of Gross Domestic Product (GDP) which is the main indicator of the country's economic health. GDP measures the market value of all goods and services produced by an economy in a given period. Gross Domestic Product (GDP) is an aggregate measure that reflects the total market value of goods and services produced by a country in a given period. In Southeast Asia Indonesia is one of the countries with the largest economy while the United States is one of the countries with the largest economy in the world. Indonesia and the United States (US) are two countries with very different economic and social conditions, which makes the comparison between the two very interesting. Indonesia, with its status as a developing country and the largest economy in Southeast Asia, has different characteristics from the US, which is a developed country with one of the largest GDP in the world.



Graph 1. Gross Domestic Product of the United States and Indonesia 2009 - 2022

The United States, as one of the largest economic powers in the world, has shown consistent GDP growth during this period. In 2022, the GDP of the United States reached an impressive figure of 20,926.84 billion USD. This marked a significant growth from 2009, which recorded a GDP of 15,950.95 billion USD. This growth reflects the great strength of the US economy in the production of goods and services, as well as its ability to innovate and adapt to global changes. On the other hand, Indonesia, as the largest economy in Southeast Asia, also showed significant GDP growth. In 2022, Indonesia's GDP was recorded at 1,122.29 billion USD, an increase from 619.29 billion USD in 2009. This growth indicates rapid progress in various sectors of the economy, including manufacturing, mining, and services.

Comparison of the GDP of these two countries shows a considerable difference in economies of scale. However, it is important to note that GDP growth reflects not only the size of the economy, but also how the country manages resources and innovations to produce goods and services. The United States and Indonesia are each unique in terms of the natural resources, labor, technology, and economic policies that contribute to their GDP growth.

Therefore, the purpose of this study is to identify the discriminant factors that distinguish the Gross Domestic Product (GDP) between Indonesia and the United States. The research is expected to provide policy recommendations based on robust data and analysis, helping policy makers in Indonesia to formulate strategies that will enhance economic growth and competitiveness on the global stage. By understanding the factors that differentiate the GDP of the two countries, Indonesia can identify potential areas for reform and investment, as well as adjust economic policies to maximize profits from international trade and foreign investment.

## LITERATURE REVIEW

### *Neoclassical Theory of Economic Growth*

Neoclassical economic growth theory is one of the most influential theories in the analysis of economic growth. This theory was developed in the mid-20th century and emphasizes the role of capital accumulation, labor, and technological progress as the main drivers of economic growth. One notable contributor to this theory is Robert Solow, who introduced the neoclassical growth model which assumes that long-term economic growth is driven by technological advances and increased productivity of factors of production.

One important concept in neoclassical growth theory is the 'Solow residual', which measures the contribution of total factor productivity to output growth that cannot be explained by changes in capital and Labour. This suggests that factors such as technological advances have an important role to play in economic growth.

### *Per Capita Income*

Per capita income is an economic measure that calculates the average income that each person earns within a geographic area, such as a country or a city, in a given period, usually one year. This concept is used to evaluate the standard of living and quality of life of the population in the region. According to (Sukirno, 2004), per capita income can be defined as the average income of the population in a country. The national income is divided by the number of inhabitants to obtain this value. Sadono Sukirno also stressed that per capita income is one of the important indicators in the analysis of economic development, because it can describe the level of prosperity in various countries. A prominent economist, defined income as a stream of receipts that can be consumed without reducing the amount or value of the sources that create those receipts (Samuelson, 1992). In the context of per capita income, this definition emphasizes the income received by an individual or household.

Research conducted by (Putri, 2022) and (Zasriati, 2022) provides new insights into the relationship between per capita income and the economy. The

results of this study indicate that there is a positive and significant influence of per capita income on the economy. This indicates that an increase in income per individual can contribute to overall economic growth.

### ***Unemployment***

Unemployment is a complex problem that has to do not only with the absence of work, but also with economic, social conditions and government policies. Unemployment is the number of people who are in the workforce in an economy and are actively looking for work but have not yet obtained it. (Sukirno, 2004). This definition emphasizes the aspect of the active search for work by individuals who have not found employment even though they are part of the workforce. According to mankwi (2000) unemployment as a macroeconomic problem that can affect human survival directly. Unemployment for the majority of people is perceived as a decline in living standards.

The International Labor Organization (ILO) divides unemployment into two categories: open unemployment and forced unemployment. Open unemployment is a human being who is in working age who for some period does not work and is willing to accept a job and is looking for a job. Forced unemployment is a person working as an employee or an entrepreneur who during a certain period has been forced to work less than normal hours and is still willing to find additional work.

Research that has been conducted by (Kusumo, 2022; Michael et al., 2016; Nagel, 2015; Prasetya & Sumanto, 2022) have shown that the unemployment rate has a significant influence on the economic growth of a country. These findings indicate that when the unemployment rate is high, economic growth tends to slow, and vice versa, when the unemployment rate is low, economic growth may increase. Where high unemployment rates can cause various social and economic problems, such as a decrease in people's purchasing power, increased poverty, and social instability. On the other hand, low unemployment rates are often associated with increased productivity, increased income, and economic stability.

### ***Export***

Export is a vital economic activity, through which the state delivers goods or services to other countries. According To (Sutedi, 2014.), exports are part of the trading system that allows domestic goods to be sold abroad in accordance with existing regulations. Exports include the entirety of goods or services sold abroad, including industrial products, agriculture, forestry, and services. (Astuti, 2013,) defines export as the process of selling goods or services from the customs territory subject to applicable laws and regulations. Exports play an important role in the economy by having a great impact on the development of industrial markets. This led to the growth of related industries and the economy in general (Wibowo, 2018).

Export is a step to sell commodities to other countries in the hope of getting payments in foreign currencies and using foreign languages in transactions.(MS, 2004). Export purposes, as expressed by Amir M.S (2004), covering the opening of new markets abroad, utilization of excess production

capacity, and adaptation to global market competition. The benefits of exports include expanding the market reach of local products and contributing to the growth of the national economy. Exports not only help in strengthening a country's economic position on the international stage but also support job creation and innovation.

Research that has been (Asbiantari et al., 2018; Safari & Fikri, 2016; Santoso & Artha, 2021; Taspinar, 2010) found that exports have a positive and significant effect on economic growth. Which means that when exports increase, economic growth will increase and vice versa. Thus, efforts to improve export performance can be one of the main strategies in promoting sustainable economic growth.

### ***Government Spending on Education***

Education is an important sector that has received serious attention from governments in various countries, including Indonesia. Government spending on education not only reflects the country's priorities for Human Resource Development, but is also an important indicator in assessing the quality and access to education for the community. Government spending on education is considered an investment in human capital that can improve the quality of human resources and productivity. According to (Castro-Leal et al., 2000) that the allocation of government funds in public services such as education aims to achieve efficiency and equality. Efficiency is achieved when public spending generates additional benefits and overcomes market deficiencies. In the field of education, it is defined as the government's ability to expand access and improve educational standards for all people.

Research carried out by (Rifa'i & Moddilani, 2021) shows that government spending in education has a positive impact on GDP per capita, although its contribution is not yet optimal. The issue of equity and disparity of fiscal capacity between regions is a major challenge that must be overcome to maximize the positive effects of these expenditures. In addition, other studies (Anggraeni, 2017; Bah, 2023; Najaf-zada & PhD, 2024) show that government spending in education has an effect on economic growth. By increasing the budget education can reduce poverty because better education provides more opportunities for individuals to improve their quality of life.

### **METHODOLOGY**

The study used secondary data from the World Bank for the period 2009-2022. In this study, the dependent variable is a dummy region that is distinguished by the highest and lowest GDP of the two countries. The selected distinguishing variables were imports and exports of goods and services, government spending on education, the number of young people not involved in education, employment, or training, the unemployment rate among individuals with advanced education, mobile subscription penetration, internet use, the Gini index, as well as the ratio of the number of poor. This research applies discriminant analysis method to identify the most significant variables in distinguishing between the two countries based on the criteria that have been set. Using this method, researchers can determine which factors contribute most to the economic differences between Indonesia and the United States.

The discriminant model in this study is :

$$Z = \alpha + W1X1 + W2X2 + W3X3 + W4X4 + W5X5 + W6X6$$

Where:

Z = discriminant score

$\alpha$  = Intercept

W = discriminant coefficient for independent variable

X1 = adjusted per capita net national income (constant US\$ 2015)

X2 = exports of goods and services (constant US\$ 2015)

X3 = exports of ICT goods (%of total exports of goods)

X4 = unemployed with advanced education (%of the total workforce with advanced education)

X5 = manufacturing exports (%of merchandise exports)

X6 = government spending on Education, total (%GDP)

## RESULT AND DISCUSSION

Table 1. Group Descriptive Statistics and Group Mean Equation Test

| Variabel Independent                | Dependent Variable Group Means |                  | Test Of Equality Of Group Means |         |              |
|-------------------------------------|--------------------------------|------------------|---------------------------------|---------|--------------|
|                                     | Group 0                        | Group 1          | Wilks' Lambda                   | F Value | Significance |
| Unemployment with further education | 5.73                           | 3.83             | 0.72                            | 9.98    | 0.00         |
| Export of goods and services        | 189104565800.00                | 2201714827000.00 | 0.02                            | 1157.15 | 0.00         |
| Manufacturing exports               | 41.45                          | 61.14            | 0.12                            | 186.79  | 0.00         |
| Net national income per capita      | 2574.00                        | 48641.76         | 0.01                            | 2615.09 | 0.00         |
| Export of ICT goods                 | 3.64                           | 9.43             | 0.06                            | 423.04  | 0.00         |
| Government spending on education    | 3.20                           | 5.72             | 0.15                            | 149.46  | 0.00         |

In discriminant analysis, the significance Test between variables allows us to assess whether there is a significant difference between groups with high and low Gross Domestic Product (GDP). In Table 1 the results of the analysis show significant differences between Indonesia with low GDP (group 0) and the United States with high GDP (group 1). Wilks' Lambda is a statistical test used in multivariate analysis to assess how well independent variables differentiate between groups. Wilks' Lambda value close to zero indicates that the independent variable makes a significant contribution in the model. In your context, Wilks' Lambda values ranging from 0.01 to 0.71 and independent variable probabilities smaller than 0.05 indicate that those variables are statistically significant and can be used to distinguish between low and high GDP classifications.

Table 2. Summary Statistics for Discriminant 2 Groups as a Whole

| Summary of Canonical Discriminant Functions |            |               |              |                       |               |            |    |       |
|---|------------|---------------|--------------|-----------------------|---------------|------------|----|-------|
| Function                                    | Eigenvalue | % of Variance | Cumulative % | Canonical Correlation | Wilks' Lambda | Chi-square | df | Sig.  |
| 1   | 625.201    | 100.0         | 100.0        | 0.999                 | 0.002         | 148.112    | 6  | 0.000 |

Output Eigenvalues show that the magnitude of Canonical Correlation is 0.999 or the magnitude of CR2 is 0.998 so it can be concluded that the contribution of variation of the independent variable can explain the low and high GDP of 99.8%. Likewise, Wilks' Lambda value in Table 2 is 0.002 and a strong Chi-square value of 148.112 indicates that the result is significant at the alpha level of 0.05. This is reinforced by a very low probability of 0.000, which is well below the alpha threshold of 0.05. From these significant results, we can conclude the existence of meaningful differences between the groups in the discriminant function under study.

Table 3. Summary of Interpretative Measures for Discriminant Analysis of Two Groups

| Varibel independent                 | Discriminant Coefficients |   | Discriminant Loadings |      | Wilks' Lambda |          | Univariate F ratio |      |
|-------------------------------------|---------------------------|---|-----------------------|------|---------------|----------|--------------------|------|
|                                     | Unstandardized            | Standardized                                  | loading               | rank | value         | F value  | sig.               | Rank |
| Net national income per capita      | 0.001                     | 1.67  | 0.428                 | 1    | 0.010         | 2615.090 | 0.000              | 1    |
| Export of goods and services        | NI                        | NI  | 0.174                 | 2    | 0.022         | 1157.146 | 0.000              | 2    |
| Export of ICT goods                 | 0.829                     | 0.618   | 0.172                 | 3    | 0.058         | 423.036  | 0.000              | 3    |
| Unemployment with further education | NI                        | NI  | -0.133                | 4    | 0.723         | 9.975    | 0.004              | 6    |
| Manufacturing exports               | 0.187                     | 0.712   | 0.114                 | 5    | 0.122         | 186.790  | 0.000              | 4    |
| Government spending on education    | 1.734                     | 0.944   | 0.102                 | 6    | 0.148         | 149.460  | 0.000              | 5    |
| (Constant)                          | -40.679                   | NI = not included in the discriminant fuction |                       |      |               |          |                    |      |

The independent variable can be considered to have significant discriminant ability when it participates into the discriminant function. Based on the data from Table 3, there are four variables that indicate the discriminant coefficient. These variables include net national income per capita, exports of ICT goods, manufacturing exports, and government spending on education.

The discriminant function formed is

$$Z = -40.679 + 0.001 (\text{national income/capita}) + 0.829 (\text{ICT goods exports}) + 0.187 (\text{manufacturing exports}) + 1.734 (\text{government spending on education})$$

In the results of the study variable net national income per capita is the biggest discriminant. Net national income per capita reflects the level of economic prosperity of individuals within a country. The difference in net national income per capita between Indonesia and the United States reflects a significant economic disparity. In 2022, the per capita net national income of the United States is about \$53541, while Indonesia is only about \$2975. This shows that the average income of US citizens is almost 18 times greater than that of Indonesians. This disparity reflects differences in economies of scale, structure, level of industrialization, and investment in education and technology. While the United States enjoys growth from mature financial and technology sectors, Indonesia still relies on agriculture and mining sectors that range against market fluctuations and natural disasters. To increase per capita income, Indonesia should focus on developing a more advanced industrial sector and efficient management of Natural Resources.

In addition to the income per capita export of ICT goods is also a variable that becomes a discriminant factor. The export of information and Communication Technology (ICT) goods is an important indicator of a country's involvement in the global economy of technology. In 2022, Indonesia recorded ICT exports of USD 5.69 billion, with the main products such as telecommunications equipment and computers. In contrast, the United States, which is the world's third-largest exporter, reported ICT exports worth USD 626.0 billion in 2021, with a more diversified portfolio including machinery and electrical equipment. This difference in export focus reflects the economic strategy of the two countries: Indonesia develops the added value of its products, while the US maintains leadership in innovation and high technology. Both countries contribute to the global ICT supply chain, but with different roles and challenges in international markets.

Next is the manufacturing export variable which indicates the industrial production capacity of a country. Manufacturing exports are an important indicator of a country's industrial production capacity. Indonesia, whose economy continues to expand, has shown an increase in its manufacturing exports. In 2022, Indonesia's manufacturing exports accounted for 42.67% of total goods exports, with the industrial sector accounting for almost all of them, at 98.7%. The main products exported include machinery, electrical appliances, clothing, footwear, as well as oil and rubber products. In contrast, the United States, with its large economy and developed manufacturing sector, exported 53.46% of its merchandise in the same year. The country exports high-tech goods and has an extensive global supply network. A comparison of manufacturing exports between Indonesia and the US highlights differences in the volume and types of goods exported. Indonesia tends to export goods that are in the middle of the value chain, such as textiles and rubber products, while the US exports high-tech goods with greater added value. Although Indonesia faces challenges such as inadequate infrastructure and high logistics costs, the country still has a strong export market in Asia, especially to China, and the US as one of the main destinations. On the other hand, the US competes with countries that also have large manufacturing production capacities, such as China and Germany.

Government spending on education, which illustrates the country's priorities in human resource investment. Education is the foundation for the development of quality human resources. In Indonesia, the government allocates about 3.28% of Gross Domestic Product (GDP) to the education sector. This figure reflects the government's efforts in improving access and quality of education across the country. Quality education is expected to create a generation of young people who are skilled and ready to face the challenges of the future. Meanwhile, in the United States, government spending on education reached 5.53% of GDP in 2022. This figure puts the United States in 17th place globally in education budget allocation. This large investment shows the country's priority in creating competitive human resources. This difference in spending figures can be influenced by a variety of factors, including differences in economic structure, political priorities, and fiscal policy in the two countries. Education is a long-term investment whose results may not be immediately apparent, but the impact will be felt for generations. Therefore, government spending on education should be seen as a strategic move that will bring great benefits to the future of a country.

## **CONCLUSION**

This study has revealed that there are four significant variables that distinguish the Gross Domestic Product (GDP) between Indonesia and the United States. These variables are national income per capita, export of Information and Communication Technology (ICT) goods, export of manufactured goods, and expenditure on education. These variables serve as discriminants that determine the economic differentiating factors of the two countries. From the results of the analysis, it can be concluded that the difference in these variables significantly affects the difference in GDP between the two countries.

Based on the results of the analysis, it is suggested that further research can focus on strategies to increase the efficiency and quality of ICT and manufactured goods exports, as well as increased investment in education. For Indonesia, improving the quality and quantity of exports of ICT and manufactured goods can be the key to increasing GDP and economic growth. In addition, an increase in education budget allocation and education system reform oriented to improving the quality of human resources will greatly affect innovation and national productivity. Further research may also explore the impact of other variables that might affect GDP, such as health, infrastructure, and political stability.

## **ADVANCED RESEARCH**

In writing this article the researcher realizes that there are still many shortcomings in terms of language, writing, and form of presentation considering the limited knowledge and abilities of the researchers themselves. Therefore, for the perfection of the article, the researcher expects constructive criticism and suggestions from various parties.

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