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# Transformation of the Indonesian Economic Structure and Forecast for Becoming Golden Indonesia 2045

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## ABSTRACT

Indonesia needs to carry out economic transformation to successfully get through the pandemic and become a developed country. Economic transformation is the key point for increasing productivity by changing the economic structure from lower productivity to higher productivity or by increasing productivity in the targeted sector. This research aims to identify sectors that contribute greatly to GDP, followed by analyzing whether there is a structural transformation of the national economy, as well as forecasting related to Indonesia's achievements as developed country in 2045. The analysis used descriptive and trend analysis. Manufacturing industry which is expected to be the main driver for achieving the vision of a Golden Indonesia has not contributed as much as is needed by the economy. The results of the analysis show that there has been no economic transformation over the last 10 years. Overlay analysis between productivity and contribution shows that the mining and quarrying sector is the sector with the most potential. The estimation model shows that it is very difficult for Indonesia to become a developed country with current economic conditions. The mining industry downstream strategy is one of the most crucial programs to increase added value in GDP and encourage even higher growth.

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## ملخص

إندونيسيا في حاجة إلى إجراء تحول اقتصادي لتتجاوز بنجاح تبعات الجائحة وتصبح دولة متقدمة. والتحول الاقتصادي هو النقطة المفصلية لزيادة الإنتاجية، عن طريق تغيير الهيكل الاقتصادي من إنتاجية منخفضة إلى إنتاجية أعلى أو من خلال زيادة الإنتاجية في القطاع المستهدف. يروم هذا البحث تحديد القطاعات التي تساهم بصورة كبيرة في الناتج المحلي الإجمالي، وأيضا تحليل ما إذا كان هناك تحول هيكلي في الاقتصاد الوطني، بالإضافة إلى توقعات تتعلق بإنجازات إندونيسيا كدولة متقدمة في عام 2045. واعتمد في التحليل على التحليل الوصفي وتحليل الاتجاهات. ويبدو أن الصناعة التحويلية، التي من المفروض أن تكون المحرك الرئيسي لتحقيق رؤية إندونيسيا الذهبية، لا تساهم بالقدر الذي يتطلبه الاقتصاد. وتظهر نتائج التحليل أنه لم يحدث أي تحول اقتصادي على مدى السنوات العشر الماضية. ويبرز تحليل التراكب بين الإنتاجية والمساهمة أن قطاع التعدين والمحاجر هو القطاع الذي يتمتع بإمكانات أكبر. ويظهر نموذج التقدير أنه من الصعب جدا على إندونيسيا أن تصبح دولة متقدمة في ظل الظروف الاقتصادية الراهنة. وتبقى استراتيجية قطاع التعدين من أبرز البرامج التي من شأنها الإسهام في زيادة القيمة المضافة في الناتج المحلي الإجمالي وتشجيع مستويات أعلى من النمو.

## RÉSUMÉ

L'Indonésie doit amorcer une transformation économique pour surmonter la pandémie et devenir un pays développé. La transformation économique est essentielle pour accroître la productivité en modifiant la structure économique, en passant d'une productivité faible à une productivité plus élevée, ou en augmentant la productivité dans le secteur ciblé. Cette étude vise à identifier les secteurs qui contribuent fortement au PIB, puis à analyser s'il existe une transformation structurelle de l'économie nationale, ainsi qu'à établir des prévisions concernant les résultats de l'Indonésie en tant que pays développé en 2045. L'analyse a utilisé l'analyse descriptive et l'analyse des tendances. L'industrie manufacturière, qui devrait être le principal moteur de la réalisation de la vision d'une Indonésie dorée, n'a pas apporté la contribution nécessaire à l'économie. Les résultats de l'analyse montrent qu'aucune transformation économique n'a eu lieu au cours des dix dernières années. L'analyse comparative entre la productivité et la contribution montre que le secteur des mines et des carrières est celui qui présente le plus grand potentiel. Le modèle d'estimation montre qu'il est très difficile pour l'Indonésie de devenir un pays développé dans les conditions économiques actuelles. La stratégie de transformation industrielle dans le secteur minier est l'un des programmes les plus importants pour augmenter la valeur ajoutée du PIB et encourager une croissance plus forte.


**Keywords**: economic leading sector, economic structure transformation, developed country

**JEL Classification:** O11, O19, O25

## 1. Introduction

Since 1967, Indonesia's development has been carried out comprehensively and planned with a focus on the economy. In 1984, population growth was successfully controlled and rice self-sufficiency was achieved. From 1968 to 1997, the Indonesian economy grew at around 6.8% per year. Even though it is still very young, Indonesia is an industrial country. In 1996, the number of poor people fell to around 11% from 70% in the early 1970s. After the 1997/98 economic crisis, decentralization and democracy became important components of the reform era. Despite facing a financial crisis and global recession in 2008/09, Indonesia was still able to maintain economic growth of an average of 5.7% per year from 2004 to 2014 (Bappenas, 2019). Even in 2024, the IMF noted that Indonesia would be ranked the eighth largest economy in the world based on GDP adjusted for PPP (IMF, 2025).

Overall, the Indonesian Vision 2045 will achieve an increase in the level of welfare of the Indonesian people, an increase in their quality of life, the Indonesian economy developing into a developed country and being among the five largest economies in the world, and better equality in every aspect of development within the framework of the Unitary State of the Republic of Indonesia sovereign and democratic (Hali et al., 2025). Through the continuation of structural reforms, effective utilization of the demographic dividend, advancements in technology, and enhanced economic competitiveness, Indonesia is projected to sustain an average annual growth rate of 5.7 percent from 2016 to 2045 (Listiyanto & Pulungan, 2021). This rapid and inclusive economic growth is expected to elevate Indonesia to high-income status by 2036 and position it as the world's fifth-largest economy by 2045. By that time, approximately 70 percent of the Indonesian population is anticipated to belong to the middle-income class (Bappenas, 2019).

As a result of the Covid-19 pandemic that has hit the country since March 2020, the Indonesian economy, which contracted in the first quarter of 2021, is still trying to recover, especially so that the level of welfare increases and Indonesia's status returns to being an upper middle income country as before in 2019 considering that currently, this status down to a lower-middle income country. Indonesia's big task in getting through the pandemic is to carry out economic transformation. Economic transformation that requires cross-sector, cross-actor and cross-region

orchestration is implemented through various strategies, one of which is the Green Economy which aims to realize sustainable development (Tabares et al., 2025; Febriyanti et al., 2024). Economic transformation is the key point for increasing productivity by changing the economic structure from lower productivity to higher productivity or by increasing productivity in the targeted sector (Yudhoyono et al., 2024; Pinto, et al., 2025; Bappenas, 2021).

In response to the pandemic, the Indonesian government has accelerated various reforms to enhance digitalization, financial inclusion, and green economic strategies, recognizing the urgent need for a more resilient and sustainable economy (Indrawati et al., 2024). Programs such as the Pre-Employment Card have been pivotal in upskilling the workforce through online platforms, leveraging expanded internet infrastructure to boost productivity, particularly in the informal sector (Gunawan et al., 2024). Additionally, the government has prioritized digital transformation across various sectors, positioning Indonesia as a leading digital economy in Southeast Asia with significant growth in e-commerce, fintech, and digital services (Primawanti et al., 2025; Chen et al., 2023; Dewi & Prasidya, 2023; ADB, 2020).

As part of the post-pandemic recovery strategy, Indonesia has embraced green economic principles, integrating them into the National Medium-Term Development Plan (RPJMN) 2020–2024 (Putra & Satria, 2024). The government has focused on promoting investment in sustainable sectors, transitioning away from subsidies for extractive industries, and reinforcing environmental regulations (Martawardaya et al., 2021; Sumarno et al., 2022).

Furthermore, digitalization and green economic strategies are increasingly seen as complementary in Indonesia's development trajectory. Research highlights that digital technologies can significantly contribute to reducing carbon emissions, fostering a more sustainable economy, and improving income distribution (Imansyah et al., 2023). The rapid growth of Indonesia's digital sector, which expanded nearly 400% from 2017 to 2021, has created new opportunities for green innovation, positioning Indonesia to integrate sustainable practices within its growing digital economy and supporting its transformation toward a more inclusive, high-income nation by 2045 (Chen et al., 2023).

This research aims to identify sectors that contribute greatly to GDP (leading sectors), followed by analyzing whether there is a structural transformation of the national economy, as well as forecasting related to Indonesia's achievements as a developed country in 2045.

This research provides important contributions to the formulation of economic policies and strategies in Indonesia, particularly in identifying sectors that can drive productivity improvement and economic growth. In the context of economic transformation, it is crucial to develop policies that support key sectors, such as manufacturing and mining, which play a significant role in structural economic changes. Therefore, this study is expected to provide a foundation for more informed decision-making by highlighting sectors with significant potential that have not yet contributed maximally to Indonesia's GDP. Furthermore, the findings of this research can offer recommendations for policymakers to design more targeted strategies to enhance the productivity of high-potential sectors, such as mining, and strengthen the manufacturing sector, which is key to achieving long-term economic goals. Policies that support downstream processing and innovation in these sectors are essential for increasing value-added output, creating jobs, and accelerating industrialization. Thus, this research can help formulate more effective strategies to support Indonesia in achieving its vision of becoming a developed nation by 2045.

## 2. Methodology

Economic transformation that requires cross-sector, cross-actor and cross-region orchestration is implemented through various strategies, one of which is the Green Economy which aims to realize sustainable development. Economic transformation is the key point for increasing productivity by changing the economic structure from lower productivity to higher productivity or by increasing productivity within the sector. Spearman rank correlation is used to find the level of relationship or test the significance of the associative hypothesis if each variable to which the data is linked is in ordinal form (Ria & Yuliawati, 2018), and the data source between the variables does not have to be the same. Structural changes/transformations in the national economy use the Spearman rank correlation test. The formula for calculating Spearman Rank (Rho) is (Kuncoro 2001):

$$Rho = (1 - 6\sum d^2)/(N(N^2-1))$$

Where :
N = amount of rank
d = algebraic difference for each rank in the two ranking distributions.

This structural change is carried out by comparing the latest (existing) condition of sectoral linkage data with the input-output table to the updated input-output table. A significant correlation coefficient value indicates structural changes in the economy, especially the linkages between sectors. The trend projection method used is forecasting with smoothing, namely double exponential smoothing. This method is used when the data shows a trend. Exponential smoothing with a trend is like simple smoothing except that two components must be updated every period - the level and the trend. Levels are smoothed estimates of the data values at the end of each period. Trend is a smoothed estimate of the average growth at the end of each period. Formula used:

$$S''_t = \alpha S'_t + (1 - \alpha) S''_{t-1}$$

$$a_t = 2S'_t - S''_t$$

$$b_t = \frac{a}{1 = a}(S'_t - S''_t)$$

Where:
$S'_t$ = Value of *Single Exponential Smoothing*
$S''_t$ = Value of *Double Exponential Smoothing*

Next, the forecasting is determined by selecting the α value that produces the smallest Mean Absolute Percentage Error (MAPE) (close to zero). MAPE indicates how big the error in forecasting is compared to the real value in the series (Perdana et al., 2016). According to Lewis (1982), MAPE values can be interpreted into the following categories (Moreno et al., 2013):

< 10% = highly accurate forecasting
10-20% = good forecasting
20-50% = reasonable forecasting
> 50% = inaccurate forecasting

## 3. Results and Discussion

### 3.1. Productivity of Industry in Indonesia

Productivity changes are a driver of structural transformation. In the modern sector, this change is dominated by the manufacturing and services sectors (UN-Habitat, 2016). This is in line with productivity movement data from 17 business sectors over the last 10 years (2013-2022), as presented in Table 1.

**Table 2:** Labor Productivity Ranking Based on Industrial Origin, Year 2013-2022

| Industrial | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | | 2021 | | 2022 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank | roduc-tivit | Rank |
| A. Agriculture, Forestry and Fishing | 27.62 | 16 | 28.97 | 16 | 31.03 | 15 | 32.06 | 15 | 35.03 | 15 | 35.74 | 15 | 38.21 | 15 | 36.06 | 14 | 37.82 | 14 | 37.10 | 14 |
| B. Mining and Quarrying | 555.50 | 3 | 553.66 | 3 | 582.49 | 3 | 526.99 | 3 | 562.17 | 3 | 543.24 | 3 | 564.35 | 3 | 584.57 | 3 | 569.55 | 3 | 560.82 | 3 |
| C. Manufacturing | 113.96 | 7 | 118.71 | 6 | 124.50 | 6 | 127.05 | 6 | 119.80 | 7 | 118.33 | 7 | 118.59 | 7 | 126.41 | 7 | 122.22 | 7 | 125.00 | 7 |
| D. Electricity and Gas | 458.94 | 4 | 460.56 | 4 | 471.54 | 4 | 385.19 | 4 | 335.83 | 4 | 311.25 | 4 | 306.45 | 4 | 358.51 | 4 | 403.70 | 4 | 393.58 | 4 |
| E. Water supply, Sewerage, Waste Management and Remediation Activities | 35.36 | 15 | 30.82 | 15 | 27.55 | 16 | 31.58 | 16 | 19.26 | 17 | 17.58 | 17 | 17.93 | 17 | 19.25 | 17 | 17.63 | 17 | 20.03 | 17 |
| F. Construction | 121.70 | 6 | 113.54 | 7 | 107.11 | 8 | 115.94 | 7 | 121.42 | 6 | 123.93 | 6 | 127.77 | 6 | 132.94 | 6 | 132.93 | 6 | 132.61 | 6 |
| G. Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | 53.34 | 13 | 56.23 | 12 | 56.55 | 12 | 58.26 | 12 | 58.36 | 12 | 58.69 | 12 | 59.60 | 12 | 56.09 | 13 | 56.33 | 12 | 58.41 | 12 |
| H. Transportation and Storage | 65.80 | 10 | 70.92 | 10 | 75.49 | 10 | 75.42 | 9 | 80.30 | 9 | 79.27 | 9 | 81.88 | 9 | 70.35 | 11 | 74.61 | 10 | 83.87 | 9 |
| I. Accommodation and Food Service Activities | 57.44 | 12 | 53.52 | 13 | 51.34 | 13 | 45.24 | 14 | 43.18 | 14 | 40.57 | 14 | 38.93 | 14 | 35.01 | 15 | 33.85 | 16 | 36.22 | 16 |
| J. Information and Communication | 648.56 | 2 | 674.32 | 2 | 779.09 | 2 | 671.84 | 2 | 614.52 | 2 | 595.62 | 2 | 639.97 | 2 | 698.68 | 2 | 697.76 | 2 | 743.63 | 2 |
| K. Financial and Insurance Activities | 204.29 | 5 | 211.45 | 5 | 207.93 | 5 | 218.56 | 5 | 231.35 | 5 | 228.38 | 5 | 249.59 | 5 | 293.65 | 5 | 290.80 | 5 | 291.19 | 5 |
| L. Real Estate Activities | 1243.80 | 1 | 961.34 | 1 | 920.85 | 1 | 785.67 | 1 | 949.20 | 1 | 761.00 | 1 | 784.59 | 1 | 823.69 | 1 | 936.31 | 1 | 753.35 | 1 |
| M,N. Business Acitivities | 101.79 | 8 | 108.36 | 8 | 108.66 | 7 | 110.84 | 8 | 103.83 | 8 | 111.40 | 8 | 106.50 | 8 | 108.90 | 8 | 97.72 | 8 | 95.81 | 8 |
| O. Public Administration and Defence; Compulsory Social Security | 79.19 | 9 | 80.88 | 9 | 76.94 | 9 | 64.17 | 10 | 71.27 | 10 | 73.28 | 10 | 73.88 | 10 | 79.97 | 9 | 75.12 | 9 | 76.59 | 10 |
| P. Education | 49.53 | 14 | 48.58 | 14 | 50.49 | 14 | 48.29 | 13 | 50.99 | 13 | 52.07 | 13 | 53.20 | 13 | 58.10 | 12 | 54.02 | 13 | 54.16 | 13 |
| Q. Human Health and Social Work Activities | 65.77 | 11 | 68.71 | 11 | 66.77 | 11 | 58.45 | 11 | 61.45 | 11 | 62.41 | 11 | 64.30 | 11 | 70.92 | 10 | 71.49 | 11 | 72.24 | 11 |
| R,S,T,U. Other Services Activities | 18.84 | 17 | 20.67 | 17 | 26.99 | 17 | 31.27 | 17 | 28.37 | 16 | 30.46 | 16 | 32.21 | 16 | 30.67 | 16 | 34.77 | 15 | 36.42 | 15 |
| **Total** | 72.33 | | 74.72 | | 78.23 | | 79.68 | | 81.91 | | 82.56 | | 85.04 | | 83.48 | | **84.85** | | 86.55 | |

Source: Statistics of Indonesia (processed), 2023

Table 1 shows that during the period 2013-2022, the Service sector and mining and quarrying sector dominate the contribution to the level of labor productivity in Indonesia. The five sectors that occupy the highest ranking based on the level of labor productivity are: (1) Real Estate Acitivities; (2) Information and Communication; (3) Mining and Quarrying; (4) Electricity and Gas; and (5) Financial and Insurance Acitivities. These five sectors remained in the same ranking position throughout this period.

There are two sectors that have consistently and gradually experienced an increase in productivity, i.e. (1) Agriculture, Forestry and Fishing; (2) Other Services Activities, such as: (a) Arts, Entertainment and Recreation, (b) Other Service Activities; (c) Individual Services that Serve Households, as well as Activities that Produce Goods and Services by Households with their own to fulfillthe needs and Activities of International Bodies and Extra Bodies International Others, both money managed by the government and private sector. Even though if you look at the ranking, these two sectors are still in the lowest rankings, namely 14-17, the level of productivity continues to increase. The Education Services sector also experienced a gradual increase in ranking until 2020, but experienced a slight decrease in ranking in 2021.

There are also industrial sectors which experienced a decline in productivity, i.e.: (1) Water Supply, Sewerage, Waste Management, and Recycling, whose ranking fell in the first 5 years, but remained relatively constant in the last 5 years; and (2) Provision of Accommodation and Food and Drink, whose ranking has continued to decline throughout the last 10 year period. These two sectors are the business fields most affected by the Covid 19 Pandemic, where there has been an increase in waste and rubbish caused by PPE waste and accompanied by a sluggish tourism industry in Indonesia due to the social distancing policy that has been implemented.

Seven other sectors experienced fluctuating ranking changes, although they were still in the same ranking range. Judging from the leap in productivity changes from 2013 to 2022, there are five sectors that have experienced an increase in productivity ranking, namely (1) Agriculture, Forestry and Fisheries; (2) Wholesale and Retail Trade; Car and Motorcycle Repair; (3) Transportation and Warehousing; (4) Education

Services; and (5) Other Services. However, there were three sectors that experienced a decrease in ranking, namely: (1) Water Supply, Waste Management, Waste and Recycling; (2) Provision of accommodation and food and drink; and (3) Government Administration, Defense and Mandatory Social Security. Nine other sectors are in the same ranking in 2013 and 2022.

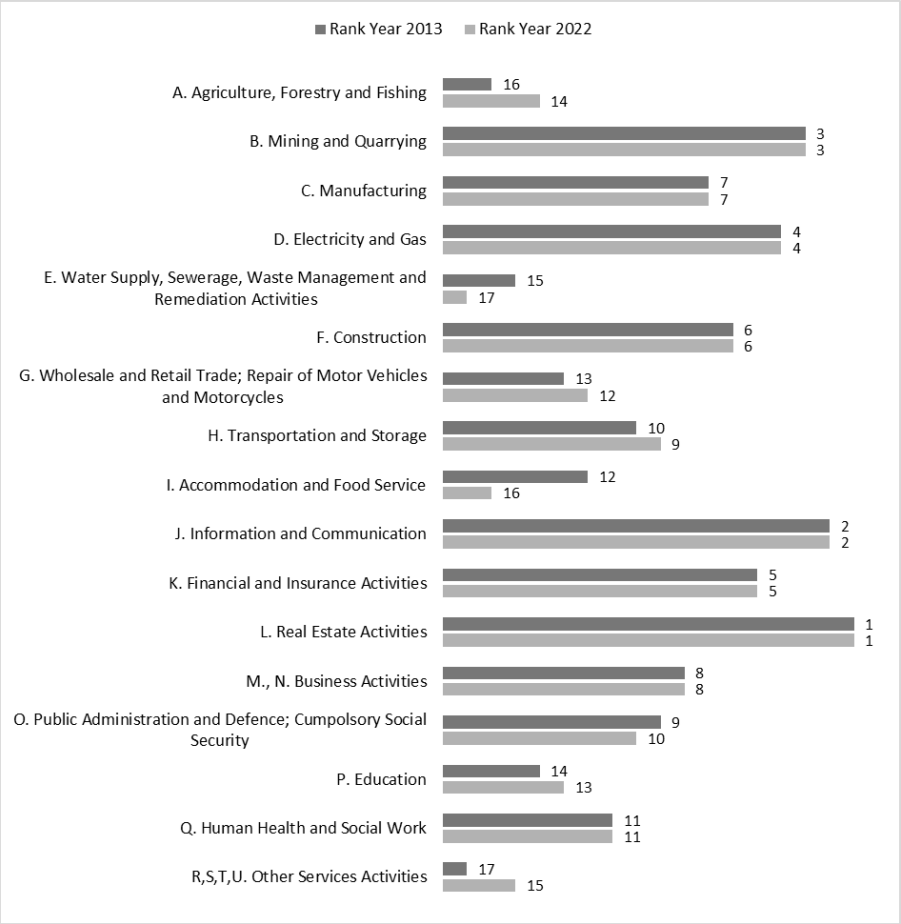
In this study, the data used is sourced from Statistics Indonesia (BPS), which is the official and reliable provider of economic statistics in Indonesia. BPS offers comprehensive data on various relevant economic indicators, including Gross Domestic Product (GDP) by sector. The variables analyzed in this study relate to the 17 major economic sectors, which encompass key sectors in the Indonesian economy. The selection of these variables is crucial as they significantly contribute to Indonesia's GDP and reflect the ongoing economic structure. Analyzing these sectors provides insights into growth patterns, productivity changes, and the potential for structural transformation across different sectors. The choice of these 17 sectors is also relevant as they represent the main focus of Indonesia's economic development policies.

The dataset used in this study is the most recent available, up to 2022, which serves as the cutoff point for this research. Although more recent data could provide a more up-to-date picture of Indonesia's economic conditions, the decision not to incorporate data beyond 2022 was made to maintain consistency in the analysis and avoid potential external influences that may not yet be fully reflected in the latest data. Additionally, significant economic changes in Indonesia following the pandemic or due to recent economic policies may take time to be reflected in newer datasets, which could impact the accuracy of long-term projections made in this study. Therefore, while there is potential for more up-to-date data, using the data up until 2022 is considered sufficient for providing valid and relevant analysis, while still focusing on long-term projections based on consistent historical trends.

### 3.2. Economic Structure Transformation

The transformation of the national economic structure based on labor productivity is shown in Figure 1. The very strong Spearman Rank correlation value (0.985 which is close to one) shows that there has been no change in Indonesia's economic structure in the last 10 years.

**Figure 1:** Indonesia's GDP Sectoral Productivity in 2013 and 2022




Source: Statistics Indonesia (Processed), 2023

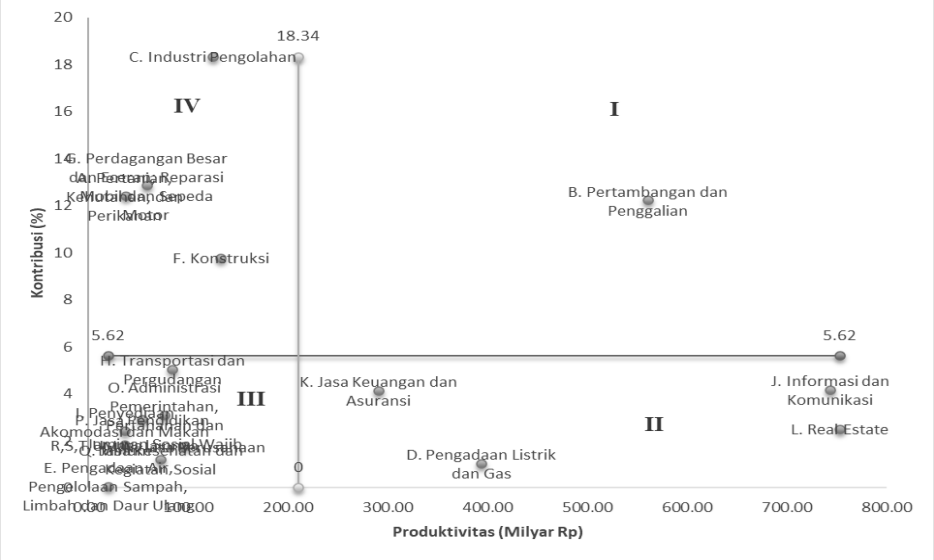
## 3.3. Productivity Mapping of Industrial Origin

Strong institutions and governance are the main basis for a country to become a developed country. Becoming a developed country means being a country with resources, including human resources, capital, land, technology and entrepreneurship. This requires a combination of three main things, qualified human resources, development of the R&D process, and good institutions (Nuryakin & Rezki, 2023).

If we look at the results of the Spearman rank correlation test on Indonesia's economic structure over the last ten years, it is indicated that there has been no transformation in the structure of the economic sector.

However, by looking at the business fields that support Indonesia's GDP, it is possible to sort out which sectors can be chosen to be pushed more strongly. If an overlay is made between business fields that have a high contribution and productivity, you can see four quadrants as depicted in Figure 2.

**Figure 2:** Overlay of Contribution and Productivity of Industries in Indonesia's GDP 2022




Source: Statistics Indonesia, 2023

The first quadrant (I) is the position where the business field has high productivity (above the average productivity of all business fields in GDP) with a high contribution (above the average contribution of all business fields) so that it becomes the industry with the most potential because it will become a sector. which is progressing and growing rapidly. This position is only filled by one sector, namely Mining and Quarrying which is suitable to be the leading sector. Indonesian mining and quarrying can provide support for Indonesia's target of becoming a developed country by 2045 by increasing the sector's contribution to the Indonesian economy. In line with the Golden Indonesia 2045 vision, the government targets Indonesia to become a developed country with GDP reaching US$7.3 trillion and per capita income reaching US$25,000 by 2045. However, to achieve this target, Indonesia must achieve average GDP growth of 7%. Without deep reform, these targets are difficult to achieve. As global demand for commodities such as coal, nickel and

copper increases, the mining and quarrying sector can increase production to meet this demand. This can increase the sector's contribution to the Indonesian economy. The mining industry downstream strategy is one of the most crucial programs to increase added value in GDP and encourage even higher growth.

The second quadrant is a position where the business field has high productivity, but its contribution is relatively lower than the average. There are four industries here, i.e.: Information and Communication; Real Estate Acitivities; Electricity and Gas; and Financial and Insurance Activities. This sector is considered relatively underdeveloped so it still has the potential to be further encouraged. The third quadrant is a group of business fields that have low productivity and contribution to GDP. Focusing on this sector will tend to waste more resources. However, this quadrant contains the most industries in Indonesia's GDP. Included in this quadrant are Transportation and Storage; Public Administration and Defense-Cumpolsory Social Security; Accommodation and Food Services; Water Supply, Sewerage, Waste Management and Remediation Activities; Financial and Insurance Activities; Other Services Activities. The fourth quadrant is a position where the sector has a large contribution to GDP, but productivity is still relatively low. Included here are Manufacturing; Wholesale and Retail Trade-Repair of Motor Vehicles and Motorcycles; Agriculture, Forestry and Fishing; Construction.

From the proportion of contribution to GDP and labor absorption between the primary, secondary and tertiary sectors, it can be concluded that Indonesia has not succeeded in carrying out economic structural transformation. The globally agreed definition of structural economic transformation is a process of transformation of economic development which includes the reallocation of productive factors from the traditional agricultural sector to the modern agricultural, manufacturing and service sectors. The manufacturing industry's contribution to GDP in 2022 is only 18.34 percent. In fact, according to the UNDP and the World Bank, one of the requirements for becoming a developed and prosperous nation-state is that this sector's contribution to GDP is at least 30 percent. Several strategies that need to be implemented then are strengthening and developing the manufacturing industry (downstreaming), both natural resource and non-natural resource based which is synergized with the modernization of the agricultural sector which will not only strengthen national food sovereignty, but will also produce various types of products

with high added value for meet domestic and export needs in a sustainable manner. The further impact that can be expected is the absorption of more labor and a high multiplier effect (Dahuri, 2023).

In the academic literature, there is considerable debate regarding the potential for structural transformation in Indonesia, particularly with regard to the role of digitalization, technological advancements, and the emergence of new sectors such as renewable energy and the creative industries (ADB, 2020). While proponents argue that digitalization can drive economic diversification and productivity, critics suggest that the pace of digital transformation in Indonesia remains slow compared to other emerging economies. For instance, some studies highlight that while digital platforms have flourished, the broader adoption of digital technologies across traditional industries, especially in manufacturing, is still limited (Javaid et al., 2024). This slow adoption can hinder the full potential of structural change, as it may prevent Indonesian businesses from fully benefiting from increased efficiency and competitiveness that digital technologies can offer (Ii, 2021).

Similarly, the rise of new sectors like renewable energy and creative industries, while promising, faces several barriers. According to recent studies, Indonesia's transition towards a green economy, which could be a key driver of future growth, is still constrained by factors such as regulatory challenges, insufficient infrastructure, and limited investment in innovation (Gulati & Prakash, 2023). Although the renewable energy sector holds significant promise, its current contribution to GDP is modest and growth remains dependent on strong government policies and increased private sector engagement. Additionally, the creative industries, although growing, still face challenges related to scaling up, intellectual property protections, and the integration of digital platforms that could enhance their global competitiveness (Hadi et al., 2023).

When comparing Indonesia's structural transformation to other ASEAN countries or similar developing economies, it becomes apparent that Indonesia is lagging behind in certain areas. For example, countries like Vietnam have shown more rapid advancements in digital economies and manufacturing, driven by higher investments in technology, innovation, and human capital (Tan & Lee, 2022). Thailand has similarly made significant strides in modernizing its manufacturing sector, particularly through automation and smart manufacturing. In contrast, Indonesia's

economic structure remains heavily reliant on resource-based sectors, and its transition towards high-tech industries has been relatively slow. This comparison highlights the challenges Indonesia faces in accelerating its structural transformation and suggests that more targeted policies and investments are necessary to align with the global trend toward digitalization and green growth.

Stagnation in Indonesia's structural transformation, particularly the continued dominance of resource-based sectors such as mining and oil and gas, has significant implications for long-term economic growth. Several studies have shown that Indonesia's reliance on these sectors limits the potential for industrial diversification and exposes the economy to global commodity price volatility. Indonesia's economic growth is heavily influenced by the fluctuations in global resource prices, which causes instability in key sectors (Thorbecke, 2023). This reliance on primary industries has hindered the development of more productive and sustainable sectors, such as manufacturing and technology, which are essential for creating high-value jobs and promoting productivity growth (Nanga & Widjaja, 2022). Moreover, despite some progress in economic development, Indonesia's manufacturing sector continues to underperform, which restricts the country from achieving the levels of diversification and productivity growth seen in more industrialized nations (Permana et al., 2023).

Structural transformation in Indonesia remains constrained by the dominance of natural resource-based sectors (Kim et al., 2020). Indonesia has not yet fully capitalized on the potential of industrialization and technological innovation, which are key drivers of sustained economic growth. The manufacturing sector, in particular, has struggled to expand due to factors such as insufficient investment in infrastructure, technology, and human capital development. As a result, Indonesia faces challenges in shifting toward a more diversified, knowledge-based economy. To address these challenges, Indonesia needs to focus on policy reforms that promote innovation, foster the development of emerging industries such as renewable energy and digital technologies, and increase investment in human capital (ADB, 2020). These efforts will be crucial for achieving long-term economic growth, job creation, and a higher income status by 2045.

## 3.4. Forecast of Indonesia Becoming a Developed Country

The World Bank and the World Trade Organization (WTO) classify the economies of countries in the world.

### World Bank Classification

The World Bank classifies the world's economies into four income groups - low, lower-middle, upper-middle and high. This classification is updated annually on July 1, based on the previous calendar year's GNI (Gross National Income) per capita. The GNI measure is expressed in United States dollars using conversion factors obtained based on the Atlas method. Income classification according to World Bank standards aims to reflect a country's level of development, using GNI per capita (Atlas method) as a widely available indicator of economic capacity. The latest thresholds for Atlas GNI per capita are presented in Table 2.

**Table 2:** Labor Productivity Ranking Based on Industrial Origin, Year 2013-2022

| | Low Income | Lower-middle Income | Upper-middle Income | High Income |
|---|---|---|---|---|
| July 1, 2023 - For Fiscal Year 2024 (New) | ≤ 1.135 | 1.136 – 4.465 | 4.466 – 13.845 | > 13.845 |
| July 1, 2022 – For Fiscal Year 2023 (Previous) | ≤ 1.085 | 1.086 – 4.255 | 4.256 – 13.205 | > 13.205 |

Source: worldbank.org, 2023

Forecasts of the Indonesian economy based on previous time series data are very important for carrying out evaluations. The vision of Indonesia 2045 is directed at an advanced, just and prosperous Indonesia within the framework of the Unitary State of the Republic of Indonesia. President Joko Widodo said that Indonesia is heading towards 2045 to become a developed country and one of the 5 (five) world economic powers.

Forecast of the Indonesian economy in 2045 using the GNI per capita indicator need to be carried out to determine forecasts for current conditions. Based on Indonesian GNI per capita data sourced from the World Bank, it was carried out using trial and error using the Double Exponential Smoothing forecasting technique with $\alpha$=0.1 to $\alpha$=0.9 (with Minitab tools). The error value is measured for the forecast results based

on MAPE (Mean Absolute Percentage Error), and then compared to which value is the best (which is more accurate), namely the smallest MAPE value.

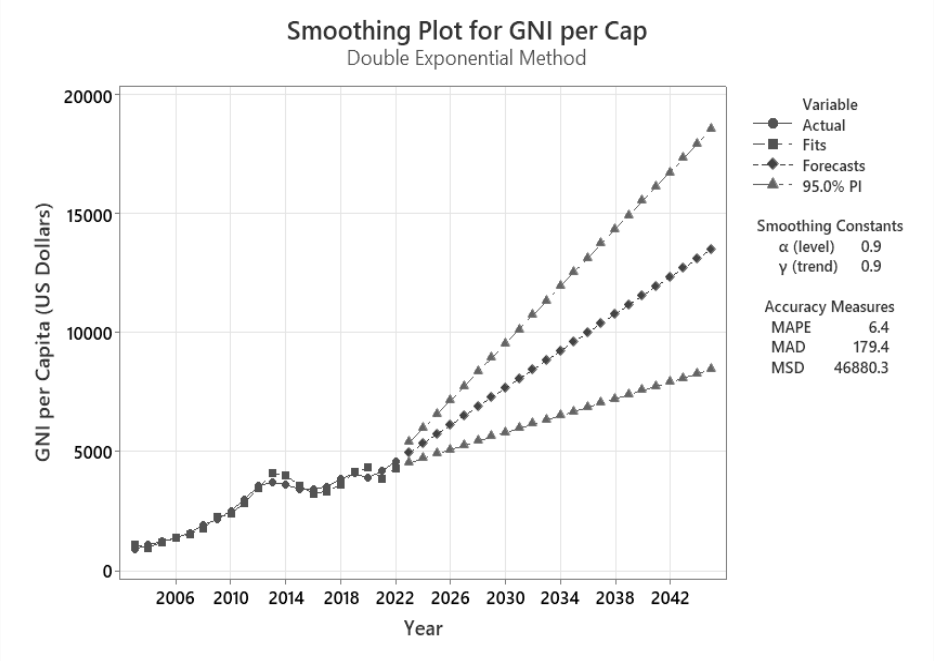
**Table 3:** MAPE Values in Forecasting Indonesian GNI per Capita with Double Exponential Smoothing (α = 0.1 to 0.9)

| A | 0,1 | 0,2 | 0,3 | 0,4 | 0,5 | 0,6 | 0,7 | 0,8 | 0,9 |
|---|---|---|---|---|---|---|---|---|---|
| MAPE | 11 | 11 | 10 | 9 | 8,3 | 7,4 | 6,8 | 6,6 | 6,4 |

Source: worldbank.org, 2023

Based on the comparison in Table 3, it is known that the smallest MAPE value is produced at α = 0.9, namely MAPE = 6.4%. Based on the MAPE classification from Lewis (1982), the MAPE value (6.4%) is included in the very accurate category (MAPE < 10%). The trend of GNI per capita in Indonesia using the Double Exponential Smoothing technique (α = 0.9) is presented in Figure 3.

**Figure 3.** Smoothing Plot of Indonesian GNI per Capita (α=0.9)




In more detail, Table 4 below presents the forecast/forecast of the value of GNI per capita for Indonesia until 2045, including optimistic (5% upper) and pessimistic (5% lower) conditions.

**Table 4.** Forecast of Indonesian GNI per Capita 2023 – 2045 (US Dollars)

| Year | Forecast | Lower | Upper | Year | Forecast | Lower | Upper |
|---|---|---|---|---|---|---|---|
| 2023 | 4942,1 | 4502,53 | 5381,6 | 2035 | 9618,0 | 6683,19 | 12552,8 |
| 2024 | 5331,7 | 4703,15 | 5960,3 | 2036 | 10007,7 | 6860,38 | 13154,9 |
| 2025 | 5721,4 | 4892,00 | 6550,8 | 2037 | 10397,3 | 7037,48 | 13757,2 |
| 2026 | 6111,1 | 5075,90 | 7146,2 | 2038 | 10787,0 | 7214,52 | 14359,5 |
| 2027 | 6500,7 | 5257,31 | 7744,1 | 2039 | 11176,6 | 7391,50 | 14961,8 |
| 2028 | 6890,4 | 5437,31 | 8343,4 | 2040 | 11566,3 | 7568,42 | 15564,2 |
| 2029 | 7280,0 | 5616,41 | 8943,4 | 2041 | 11956,0 | 7745,31 | 16166,6 |
| 2030 | 7669,7 | 5794,94 | 9544,5 | 2042 | 12345,6 | 7922,16 | 16769,1 |
| 2031 | 8059,4 | 5973,05 | 10145,7 | 2043 | 12735,3 | 8098,98 | 17371,6 |
| 2032 | 8449,0 | 6150,87 | 10747,2 | 2044 | 13125,0 | 8275,77 | 17974,1 |
| 2033 | 8838,7 | 6328,46 | 11348,9 | 2045 | 13514,6 | 8452,54 | 18576,7 |
| 2034 | 9228,3 | 6505,89 | 11950,8 | | | | |

Assuming that the country's economic classification threshold does not change, then in 2045 it will still be very difficult for Indonesia to become a high income country or often referred to as a developed country. Unless Indonesia is in an optimistic condition, and there is an acceleration in GNI per capita.

**WTO Classification**

The WTO actually does not have a specific definition of developing or developed countries. Each country can determine for itself whether it is a developed or developing country. Then, other countries can assess the decisions of other countries' governments in determining their country groups.

Developing countries can be defined as countries that have low economic and industrial activity. Meanwhile, according to the United States Trade Representative Office (USTR), there are several indicators for developed countries, namely:

- Per capita income above US$12,375 per year
- Global trade is more than 0.5% of total world trade
- Member of the European Union or G20
- Enter the membership group of developed countries - Organization for Economic Development Cooperation (OECD)

The United States itself has actually removed Indonesia from the list of developing countries at the WTO, as stated by USTR. The WTO positions

Indonesia as a developed country because Indonesia meets two indicators, namely a market share of 1% in the world and being a member of the Group Twenty (G-20).

## 4. Conclusion

The processing industries which is expected to be the main driver for achieving the vision of a Golden Indonesia has not yet contributed as much as is needed by the economy. Being a developed country, at least 30% of GDP is contributed by the processing industry. However, currently industry in Indonesia only contributes an average of 20%, even though the manufacturing industry has become the main contributor to GDP.

To achieve a major contribution in the industrial sector, deep structural transformation is needed by driving productivity. During the 2013-2022 period, the service sector and mining and quarrying business fields had the highest labor productivity in the economy. The very strong Spearman Rank correlation value (0.985 which is close to one) shows that there has been no change in Indonesia's economic structure in the last 10 years. Overlay analysis between productivity and contribution shows that the mining and quarrying sector is the sector with the most potential.

The results of the analysis show several important things that must be considered to support these big ideals. First, the estimation model carried out shows that it is very difficult for Indonesia to become a developed country with a per capita income of at least US$22,000 assuming economic conditions like those that occur today. Industries which is currently the leading sector, has several analysis techniques, i.e. manufacturing sector and mining and quarrying sector. The mining industry downstream strategy is one of the most crucial programs to increase added value in GDP and encourage even higher growth.

This study concludes that Indonesia's economic transformation has been slow and limited, particularly in its manufacturing sector, while resource-based industries such as mining and services continue to dominate the economy. As a result, the country faces significant challenges in achieving its goal of becoming a high-income nation by 2045. The limited structural change over the past decade, despite the potential of emerging sectors like renewable energy and digital industries, indicates that the

country must address key barriers to economic diversification and productivity growth. Without significant policy interventions and industrial reforms, Indonesia may struggle to transition to a more competitive and high-value economy.

To overcome these challenges, the study emphasizes the need for more robust policy interventions, particularly in fostering the development of manufacturing and technology-driven sectors. Enhancing productivity through innovation, improving infrastructure, and increasing investments in human capital are essential for driving Indonesia's structural transformation. Moreover, the government should focus on accelerating the growth of emerging sectors, such as renewable energy and digital industries, to diversify the economy and reduce its reliance on resource-based industries. Additionally, promoting greater industrial diversification, facilitating investment in R&D, and strengthening the workforce's technological capabilities are crucial steps toward securing sustainable and inclusive economic growth. For Indonesia to meet its 2045 vision, a concerted effort toward structural reform, supported by targeted policy changes, is imperative to unlock the full potential of its economy.

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