

Research Article

Determinants of Labor Productivity in APEC Countries

Bella Intan Feronica, Dirta Pratama Atiyatna* and Yunisvita

Sriwijaya University, Indonesia

Abstract.

The labor productivity of a nation is one of the most significant determinants of economic growth. The labor productivity growth in APEC countries between 2016 and 2021 has been unstable. The objective of this research is to confirm the partial or simultaneous impact of HDI, FDI, and inflation on labor productivity in APEC countries. The research type is quantitatively descriptive and verification. The analysis carried out was a panel data regression analysis carried out using a research sample that consisted of 20 APEC countries in the years 2016–2021. The Random Effect Model (REM) is selected as the model for this research. The results indicated that the HDI of 7.32 had a marginally significant positive influence on labor productivity in APEC countries. Consequently, an FDI of 4.15 had a significantly positive impact on labor productivity in APEC countries, whereas an inflation of 0.01 had a nonsignificant positive effect on labor productivity in APEC countries. HDI, FDI, and inflation all have a significant impact on labor productivity in APEC countries.

Corresponding Author: Dirta
Pratama Atiyatna; email:
dirtapratama@fe.unsri.ac.id

Published: 3 May 2024

Publishing services provided by
Knowledge E

© Bella Intan Feronica et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the SEABC Conference Committee.

Keywords: productivity, HDI, FDI, inflation, REM

1. Introduction

The Asia-Pacific Economic Cooperation (APEC) is an organization that has the primary purpose of pursuing the liberalization of trade among its member economies. Because of this, APEC is an organization that plays an important part in trade. According to [1], countries that eliminate barriers in their economic environment stand to benefit more from economic liberalization. It is necessary to look at how productive the countries are as a consequence of the results of trade liberalization between the economies of member countries when researching the trade that is carried out by each of the APEC countries. This is because labor productivity is one of the most important factors for economic growth in a country, and researching the trade that is carried out by each of the APEC countries. Because people are such an important component of both the economic and social landscape, economic growth is inextricably bound up with their role in the process.

 OPEN ACCESS

The countries that make up APEC have an abundance of human resources that can be put to use in the labor. By the year 2020, the APEC countries will be home to as much as 38 percent of the world's total population. In addition to the personnel available, [2] reports that the combined GDP of the APEC countries would be US\$ 52 trillion in the year 2020. This represents 62 percent of the world GDP. Because APEC countries have a high source of labor and GDP, it is vital to determine how much labor productivity will indicate how effective the labor market is. This may be done by determining how much labor productivity can be shown. The gross domestic product (GDP) is divided by the total number of workers to arrive at a measurement of labor productivity.

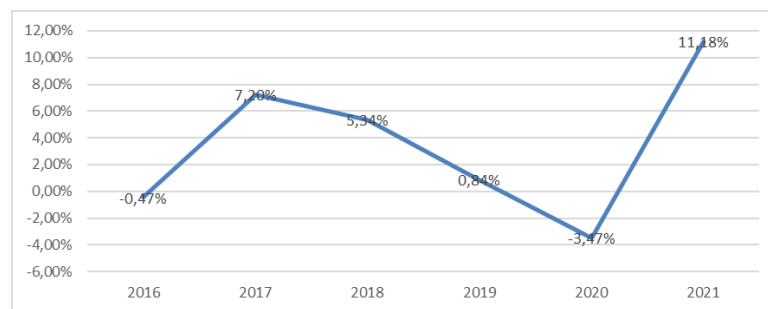


Figure 1: Labor Productivity Growth in APEC Countries, 2016-2021. Source: The World Bank.

According to Figure 1.1, the growth of labor productivity in APEC countries would be erratic from 2016 through 2021. A large drop is anticipated to take place between the years 2017 and 2020. Even in 2019, there was almost no growth in labor productivity, which came in at 0.84 percent, and it wasn't until 2021 that it started to increase again that it saw its largest decrease of -3.47 percent. The phenomenon that took place in countries that are members of APEC suggested that shifts in the growth of labor productivity had taken place over the course of the previous six years. On the other hand, foreign direct investment was -103.71 percent lower in 2016 than it will be in 2020, when it will be -23.13 percent and inflation will be 1.59 percent. Productivity in 2016 was negative 0.47 percent. In 2017, the growth rate of labor productivity was 7.20 percent, which was comparable with the growth rate of foreign direct investment (FDI), which was 38.9 percent over the previous year. This was followed by an inflation rate that was low at 2.13 percent and an HDI that was unchanged at 0.82.

The number of workers who do not satisfy the prerequisites (health, education, and a decent life) is insufficient in the environment of severe competition since there are not enough of them workers. Employing labor productivity as a yardstick to evaluate the quality of available human resources. [3]. This definition assesses the labor's capacity to generate goods and services, which is heavily reliant on the education and skills possessed by the labor.

According to [4], there are two forms of capital that have the potential to increase labor productivity: human capital and fixed capital. According to [5], the Human Development Index (HDI) is a tool that can be used to measure the quality of the workforce based on factors such as education, health, and other human characteristics. Since HDI is a measure of human development performance, an increase in HDI indicates the progress that has been made in the area of human development.

Productivity is ultimately what matters most, despite the fact productivity isn't everything. According to [6], a country's capacity to improve its standard of living is directly correlated with its capacity to increase output per worker employed. The increase in labor output affects the competitiveness of the economy because the level of labor productivity affects the level of economic competitiveness at the national level. Therefore, the economic competitiveness of each country poses a major challenge in profitability, which will have an impact on increasing foreign direct investment [7].

According to [8], rising inflation has a negative impact on productivity because it reduces the purchasing power of employees. When employees feel their income is decreasing, they become less productive, which in turn has a negative impact on the productivity of the company as a whole. This study combines the variables HDI, FDI, and inflation to examine their effect on labor productivity with a focus on APEC nations in 2016-2021 from references to earlier research that focused on one of the variables we combined.

2. Theory, Literature Review, and Hypothesis

[4] confirm through the use of panel fem regression that the human development index has a considerable impact on the labor productivity of Java's big and medium industrial sector. This finding was reached by analyzing the data. Since there are differences in the relevant HDI categories from countries to countries, this may have an impact.

According to the findings of [9] research titled Analyzing the Structural Relationship between Labor Productivity and Investments in Indonesia: An Application of Two-Stage Least Square [9], the same findings indicate that an increase in human capital contributes positively and significantly to an increase in labor productivity in the EU. In addition, [10] claim that the human development index can be utilized as an indicator for determining how productive an economy is. If workers are provided with comprehensive education or training and are in good health, they will be more productive in carrying out manufacturing procedures that are enhanced and more efficient.

Employing data spanning from 2009 to 2012 and employing panel analysis, [11] investigated the effect of HDI on Malaysia's labor productivity. According to the findings, the HDI had a constructive and significantly favorable influence on the level of output produced by workers. In addition, their findings suggest that factors such as education and health play a vital part in increasing Malaysia's labor productivity.

In this research, Sarwar and colleagues make use of the ARDL (Autoregressive Distributed Lag) model to estimate long-term variable connections for the time period spanning 1981 to 2018. There is a positive association between foreign direct investment and the growth of worker productivity. This is achieved through the transfer of technology, the introduction of new production methods, the development of managerial skills, the acquisition of knowledge about domestic markets, integration with global value chains, and access to new markets. These benefits provide positive externalities, such as technology and skill spillover effects [6, 12–14]

Similarly, the research conducted by [15], which was evaluated by the Johansen method and the Dynamic Least Squares Method (DOLS), discovered that foreign direct investment (FDI) affects labor productivity in the host countries due to the transfer of technology by foreign investors. The research indicates that foreign direct investment (FDI) in the technology sector can result in an increase in productivity either through the development of new technologies or the improvement of current technologies. The application of technology that is more advanced can be of assistance in boosting the output and effectiveness of the production process.

In line with other studies, [16] conducted research in the Russian Federation over the period of 2010-2018 in 59 different areas using a panel data methodology. There is a correlation between foreign direct investment and increases in worker productivity in Russia. According to the findings of research, FDI contributes to improvements in occupational health and safety. A labor that is both healthy and safe is often one that is able to offer more to the company and has higher levels of productivity. In addition, [17] investigated the factors that led to the rise or fall of worker productivity in the Asia-Pacific area by using panel data spanning the years 1980 to 2014. This research shows that trade openness and foreign direct investment have a large positive effect on developing countries, but that trade openness has no impact on the productivity of industrialized countries in the Asia-Pacific countries.

According to [18], foreign direct investment (FDI) has a positive long-term effect on the growth of labor productivity for the period 1990-2017. This relationship is examined using the ARDL model, which states that FDI in increasing capital and infrastructure can assist in increasing productivity by improving business processes, accelerating production

time, and increasing efficiency. Productivity not only implies the availability of cheaper quantities of products and services that are advantageous to local consumers, but it also attracts international investors to establish their businesses in the country due to lower unit costs and better profits [7]. Productivity not only denotes the availability of cheaper quantities of goods and services that are advantageous to domestic consumers, but it also promotes foreign investors to establish their businesses in the country.

[8] investigated the connection between the level of productivity in the Turkish manufacturing industry and the rate of inflation using quarterly data spanning the years 1988 through 2012. It was discovered through the use of the cointegration and Granger causality approaches that the rate of inflation and labor productivity had a statistically significant inverse relationship. Inflation also has an effect on long-term productivity, according to research that was carried out in Bulgaria and Romania from 1991 to 2014 using the ARDL cointegration test and Toda and Yamamoto's causality test [19].

According to the findings of [20] research, which analyzed the period between 1970 and 2007 for the Malaysian economy in terms of labor productivity and inflation, using the cointegration test and Granger causality analysis, the relationship between inflation and labor productivity was found to be both significant and negative. Furthermore, the research found that the relationship between inflation and labor productivity was causally related.

Research conducted using pooled least squares (PLS) suggests that high inflation rates have a negative influence on labor productivity in OECD Countries. This is due to the fact that price volatility in the economy leads to limited foreign direct investment (FDI), sluggish economic development, and eventually poor levels of productivity. In addition to this, it illustrates that inflation lowers the incentives for working for a company [21].

[20] came to the conclusion, through the use of the cointegration test and the Granger causality analysis, that the relationship between inflation and labor productivity for the period between 1970 and 2007 for the Malaysian economy in the context of labor productivity and inflation was negative and statistically significant. This was found to be the case in the context of inflation and labor productivity.

Research conducted using pooled least squares (PLS) suggests that high inflation rates have a negative influence on labor productivity in OECD Countries. This is due to the fact that price volatility in the economy leads to limited foreign direct investment (FDI), sluggish economic development, and poor levels of productivity. According to [21], inflation also makes it less attractive for people to work.

3. Research Methods

The objectives of research methodologies are to characterize the characteristics of the data. Methods, including models, approaches to analysis, and steps done, should be thoroughly elaborated and enhanced. The equations need to be numbered in the same order as the picture. Typically, the following subsections will follow after this section: Sampling (including a description of the target population, the setting of the research, and the unit of analysis; sample; and responder profile); data collection; and size (or, alternatively, measurement). The following components of the research approach should be included: There is a concise explanation of the prevalence of this research method; the reasons for selecting a particular method are thoroughly explained; the accuracy of the research design is appropriate; the research sample is appropriate; the data collection process is carried out correctly; and there is evidence that the relevance of data analysis methods has been demonstrated.

This research makes use of quantitative secondary data variables for HDI, FDI, and inflation in 20 APEC Countries between the years 2016 and 2021. Panel data mixes information from time series with information from cross-sections. This research makes use of data from the World Bank, Economy Country, as well as older journal articles covering the years 2016 to 2021.

Research model applied in the scientific community:

$$LP_{it} = a + \beta_1 HDI_{it} + \beta_2 FDI_{it} + \beta_3 INF_{it} + e_{it}(1)$$

Where: LP stands for labor productivity, a stands for a constant, HDI stands for the human development index, FDI stands for foreign direct investment, INF stands for inflation, $\beta_1, \beta_2, \beta_3$ stands for the regression coefficient, i stands for the cross-section data of 20 APEC Countries, t stands for the time series data of 2016-2021, and e is for the standard error. Testing for regression using panel data can be done in three different ways: using a model with a common effect, a model with a fixed effect, and a model with a random effect. After defining the estimate model, which can be done with three tests: the Chow test, the Hausman test, and the Lagrange multiplier test, the optimal model will be picked from the three approach models. This will be done by selecting the model with the best estimation.

4. Results and Discussion

The Outcomes of the Panel Data Estimation Based on Regression Following the selection of REM as the most suitable estimate model, an investigation of multiple linear regression was carried out. The HDI, FDI, and inflation rates are the independent factors that are being examined in this research. The dependent variable that is being examined is labor productivity

TABLE 1: displays the results of the random effect model regression for panel data.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.21	0.58	7.15	0.00
HDI	7.32	0.7	10.45	0.00
FDI	4.15	2.03	2.04	0.04
INF	0.01	0.006	1.83	0.06
<i>Effects Specification</i>				
			S.D.	Rho
<i>Cross-section random</i>			0.44	0.97
<i>Idiosyncratic random</i>			0.06	0.02
<i>Weighted Statistics</i>				
<i>R-Squared</i>	0.501	<i>Mean dependent var</i>		0.65
<i>Adjusted R-squared</i>	0.48	<i>S.D. dependent var</i>		0.97
<i>S.E. of regression</i>	0.06	<i>Sum squared resid</i>		0.56
<i>F-statistics</i>	38.84	<i>Durbin-Watson sat</i>		1.25
<i>Prob(F-statistics)</i>	0.00			

Source: Processed data

The formulation of the linear equation utilized in the investigation is as follows:

$$LP = 4.21 + 7.32 HDI + 4.15 FDI + 0.01 INF + e$$

In the absence of the HDI, FDI, and inflation variables, the constant value (LP) of 4.21 thousand suggests that the labor productivity variable would grow by 4.21 thousand. 7.32 is the coefficient that represents the HDI level (1). This illustrates that the Human Development Index has a beneficial effect on the productivity of labor. If there is no change in any of the other factors, which is what we mean when we say “Ceteris Paribus,” then the HDI will go up by one percent, and the APEC countries’ labor productivity will go up by 7.32 percent. The similar result can be expected if both the value of the other variable and the value of the HDI variable are both found to be 7.32 points lower. The

computed t value generated by n is 10.45 times that of the t table, which is 1.98, and the sig value of 0.00 is less than 0.05, which indicates that the HDI variable has a 10.45-fold impact on LP. Additionally, the t value calculated by n is 10.45 times that of the t table, which is 1.98.

The level of foreign direct investment has a coefficient value of 4.15. This illustrates that foreign direct investment (FDI) has a favorable impact on the productivity of workers. In the event that foreign direct investment (FDI) rises by one billion dollars while all other factors remain unchanged, the level of labor productivity in APEC Countries will rise by 4.15 percent. The same consequence will take place even if the value of the other variable is allowed to remain unaltered and the value of the FDI variable is allowed to fall by 4.15. Given that the estimated t value of 2.04 is higher than the t table value of 1.98 and the sig value of 0.04 is lower than 0.05, it can be deduced that the FDI variable has a considerable influence on the LP value of 2.04.

The value of the coefficient of the inflation rate, which is 3, is 0.001. This illustrates that there is a positive relationship between the inflation rate and labor productivity. If there is an increase of 1 percent in inflation and all other factors remain constant, then there will be a 0.01 percent increase in the amount of labor productivity in APEC countries. If both the value of the other variable and the value of the inflation variable both fall by 0.1, the same consequence can be expected to occur. Since the computed value of t, which is 1.83, is lower than the value of t in the table, which is 1.98, and the sig value, which is 0.06, is higher than 0.05, this suggests that the inflation variable does not have a substantial impact on the LP value, which is 1.83.

According to the probability value (F-Statistic), given that the estimated F value of 38.84 is higher than the value of 2.68 found in the F table, and the significant value of 0.00 is lower than 0.05, the probability value suggests that the null hypothesis is correct. This indicates that LP is affected in a certain way by the variables IPM, FDI, and INF.

4.1. Theoretical Relationship

4.1.1. The Impact of HDI on Labor Productivity in APEC Countries

The results of the regression analysis using a random effect model show that the influence of HDI on labor productivity has a significance value of 0.00 0.05, which indicates that hypothesis H0 is rejected and hypothesis H1 is accepted. The coefficient value for HDI level is 7.32. This suggests that the degree of HDI has a beneficial

and significant effect on labor productivity in APEC countries. If workers are provided with comprehensive education or training and are in good health, they will be more productive in carrying out manufacturing procedures that are enhanced and more efficient.

The findings of this research are consistent with the findings of multiple studies [7, 10, 11] that HDI is positively related to labor productivity. This is because workers who are better educated, healthier, and wealthier are able to adopt new innovations and technologies and have more manpower than workers who are not. Additionally, the findings of this research show that HDI is positively related to labor productivity. There is a favorable relationship between the HDI components and worker productivity.

According to the findings of [22], the Human Development Index (HDI) education component has a positive association with labor productivity. Labor productivity can be increased by investing in human resources such as education and skill development, which ultimately leads to an improvement in an organization's overall performance. Education has the potential to improve the labor in terms of their knowledge, skills, and talents. Workers with higher levels of education often possess skills that are more in line with the demands of the labor market and are able to fast adjust to changes in both technological advances and the requirements of their jobs. According to [14], receiving a higher education can not only promote social mobility but also provide a motivational boost that leads to increased levels of production.

The following component, health, has an effect on workers who are mentally and physically healthier because these workers have more energy and are more productive. As a result, these workers have greater incomes and are less likely to miss work due to illness. As a direct result of this, their contributions to overall productivity are significantly higher. According to [10], "good health" occurs when the overall health condition of a population improves as a result of increased access to health services and a healthy lifestyle. This generally results in an improvement in labor productivity. A healthy labor has higher rates of employee attendance, increased vitality, and improved job abilities, all of which contribute to an increase in overall productivity.

According to [9], there is a high standard of living because the HDI takes into account variables such the availability of clean water and sanitation facilities, enough housing, and a sufficient income per person. When people have better living conditions, there is a better chance that there will be more prosperity and economic stability. Increased earnings and economic security can have a favorable influence on labour productivity by lowering employees' levels of stress caused by financial concerns and allowing workers to concentrate on labor productivity without the interference of economic uncertainty

or distractions. A high standard of living can lead to an increase in productivity since it encourages people to put in more effort in their work.

TABLE 2: Growth of the Human Development Index and Labor Productivity in APEC Countries, 2016-2021.

Variable	2016	2017	2018	2019	2020	2021	Rata-Rata
HDI	0.47%	0.43%	0.46%	0.51%	-0.59%	-0.11%	0.20%
LP	-0.47%	7.20%	5.34%	0.84%	-3.47%	11.18%	3.44%
Pengaruh	-	+	+	+	+	-	+

Source: Processed data

If the data that are currently available are analyzed, it can be seen that there is a positive relationship between HDI and labor productivity. The conclusions of the research are in line with the data on the growth of the HDI and labor productivity in APEC Countries between the years 2016 and 2021. Both the HDI and labor productivity saw positive growth between the years of 2017 and 2020. The Human Development Index (HDI) and labor productivity both improved in 2017, 2018, and 2019, but both decreased in 2020. Nevertheless, there is a deterioration in the relationship in 2016 and 2021. In addition, both the average HDI and labor productivity were favourably affected, with HDI rising by 0.20 percent and labor productivity rising by 3.44 percent respectively. This is evidence that the quality of human resources in APEC countries has been improved to a significant degree. This suggests that the policies of each nation are extremely effective in increasing the HDI, which has a beneficial effect on the amount of work that is produced by its labor.

4.1.2. The impact of FDI on Labor Productivity in APEC Countries

With a significance level of 0.04 0.05, the findings of the random effects regression analysis of health variables on labor productivity indicate that hypothesis H1 should be accepted while hypothesis H0 should be rejected. The value of the coefficient for the FDI level is 4.15. This illustrates that the level of foreign direct investment has a favorable impact on the level of labor productivity.

Research conducted by [6, 7, 13, 14, 18] all suggest that FDI has a beneficial effect on labor productivity that is statistically significant. According to the findings of [16], who discovered that foreign direct investment (FDI) affects the productivity of labor in Russia, labour that is healthier and safer will be more productive and will be able to contribute more if occupational health and safety is improved.

The positive and significant effects of foreign direct investment (FDI) are the result of a number of variables, including extra capital, the introduction of new technology, enhanced skills and training, and economies of scale. Further monies can be invested to generate further cash, and those funds can be invested in new infrastructure, equipment, and technology.

According to [18], the addition of capital can raise production capacity and the efficiency with which resources are used. With foreign direct investment, countries are able to employ equipment that is more contemporary and efficient, which boosts worker productivity. According to [15], the implementation of innovative technology can expedite and streamline production processes, automate mundane responsibilities, and result in higher product quality. The introduction of new technology has the potential to raise worker productivity by reducing the number of tasks that involve repetition and improving the effectiveness of the manufacturing process.

According to [15], FDI also influences labor productivity due to technology transfer to the investment destination country. FDI has the potential to boost productivity through the use of new technologies or the improvement of existing ones. By utilizing new technology, the production process will be simplified, and this simplification will help to improve both the efficiency and the output of the production process. According to [15], new technologies have the potential to speed up and simplify production procedures, automate routine tasks, and improve product quality. The deployment of new technologies has the potential to boost worker productivity by reducing the amount of work that involves repetitive tasks and improving the efficiency of production processes.

Countries that engage in the training and development of their labors offer skills upgrading and training to their labors, which helps the labor to improve its capabilities, adopt industry best practices, and adjust to advances in technology [6]. The labor is able to function more effectively and efficiently when it has better skills, which leads to an increase in overall productivity. A nation's economic scope can be expanded with the assistance of FDI, which can lead to improvements in skills. Because of economies of scale, the cost of production drops down to a lower level for each individual unit when production volume rises [7]. Greater economies of scale allow for countries to make more effective use of their resources and to profit from a more efficient division of work, both of which can lead to a rise in labor productivity.

The statistics show a positive correlation between FDI and labor productivity in 2016, 2017, 2019, 2020, and 2021, but a negative connection between FDI and labor productivity in 2018. Foreign direct investment (FDI) in APEC Countries has had a

TABLE 3: Annual Growth Rates of Foreign Direct Investment and Labor Productivity in APEC Countries, 2016-2021.

Variable	2016	2017	2018	2019	2020	2021	Average
FDI	-105%	20%	-9%	15%	-23%	86%	-2.67%
LP	-0.47%	7.20%	5.34%	0.84%	-3.47%	11.18%	3.44%
Impact	+	+	-	+	+	+	-

Source: Processed data

beneficial influence on labor productivity. This is proven by the data showing a positive correlation between FDI and labor productivity in 2016, 2017, 2019, 2020, and 2021. The same thing happened with average FDI growth of -2.67 percent and average labor productivity increase of 3.44 percent, which indicates that there is a negative association between the averages. In order to raise labor productivity, APEC Countries need to boost their return on foreign direct investment.

4.1.3. The impact of inflation on Labor Productivity in APEC Countries

In the regression analysis of the inflation variable on labor productivity with a random effect and an inflation rate coefficient value of 0.1, if the significance level is 0.06 and it is more than 0.05, this implies that the null hypothesis H1 is accepted while the alternative hypothesis H0 is rejected. This illustrates that inflation has a beneficial influence on labor productivity, albeit a little one that is inconsequential.

In point of fact, according to the data for the inflation rate from 2016-2021, whenever there is an increase in the inflation rate, there is also an increase in the labor productivity. Over the course of the last six years, inflation has climbed by a mean rate of 0.35 percent, while labor productivity has increased by a mean rate of 1.21 percent. This suggests that the inflation that took place between the years 2016 and 2021 had a modestly favorable influence on the productivity of the labor force.

A number of researchers, such as [7, 8, 20, 21], have come to the conclusion that inflation has a detrimental impact on the level of labor productivity. According to the findings of research carried out by [7], inflation can lead to an increase in the cost of living. This increase in cost of living can push people to seek additional money by dedicating less time and effort to their primary job, which can result in decreased work productivity.

According to earlier studies [21] on the topic, inflation was found to have a detrimental effect on worker productivity. Despite this, [21] found that inflation continues to have a favorable influence on labour productivity. According to the findings of the research, the

average rate of inflation is 2.2%, which is considered to be moderate (10%/year), and the maximum value is 7.0%, which is also considered to be moderate [23]. According to [48], not all instances of inflation have a detrimental impact on the economy. This is particularly true when the rate of inflation is less than 10%.

Research indicating an average increase in inflation of 0.35 percent [24] includes this phenomenon under the heading of “creeping inflation.” A low inflation rate is characteristic of a condition referred to as “creeping inflation,” which occurs precisely when there is a steady increase in prices with a relatively modest percentage over an extended period of time. As a result, inflation is still capable of having both beneficial and insignificant consequences. This inflation will turn negative if it enters the medium inflation stage, which is marked by price rises that are pretty high, sometimes run in the short term, and have an accelerated nature; this means that prices this week or month are higher than prices last week or month, and so on. Medium inflation is characterized by price increases that are quite high, sometimes run in the short term, and have an accelerated nature.

Despite the fact that the average inflation rate for the period 2016-2021 is positive, it is mild and sluggish, offering economic clarity, low uncertainty, and the continuation of price increases. If current economic conditions remain consistent and there is a relatively low level of uncertainty, the effect of inflation on labor productivity may be virtually nonexistent. According to [47] and [25], minimal uncertainty enables the state and labor to plan efficiently and compensate for the effects of inflation on worker productivity. This is the case even when there is uncertainty about the future.

In a climate marked by inflation, there is a greater likelihood of frequent salary adjustments being made in an effort to compensate for the rise in the cost of goods and services [26]. However, state pay adjustments can help maintain acceptable compensation levels and a labor force that may face a reduction in purchasing power as a whole. Inflation can diminish the purchasing power of employees, and these changes can help maintain adequate compensation levels. Even in the face of rising inflation, wage adjustments make it possible for workers to keep their attention on improving their output.

The third factor that keeps inflation from having a substantial effect is the country's emphasis on productivity and efficiency, which has an influence on labor productivity. This emphasis has an impact on the amount of money that is produced by workers. According to [19], inflation will have no impact on Countries or labors whose attempts to boost productivity and efficiency are backed by the utilization of more modern technology, the growth of labor skills, or the improvement of production processes.

Diversification and cost reductions are among the elements that do not have a substantial impact on inflation, according to the book written by [27]. It's possible that Countries who are better able to adjust to the ups and downs of inflation could have a competitive advantage when it comes to dealing with the issue. Both maintaining a high level of labor productivity and withstanding the effects of inflation can be aided by effective cost reduction and diversification of economic activity. [49] cites political stability, strong infrastructure, access to efficient markets, and government policies that support investment and economic growth as the final element in determining worker productivity.

TABLE 4: Inflation and Labor Productivity Growth in APEC Countries, 2016-2021.

Variable	2016	2017	2018	2019	2020	2021	Average
Inflation	60%	26%	-2%	-15%	-78%	53%	7%
Productivity	-0.47%	7.20%	5.34%	0.84%	-3.47%	11.18%	3%
Impact	-	+	-	-	+	-	+

Source: Processed data

The rate of inflation has a little favorable but small impact on labor productivity in the APEC member states. The influence of inflation on worker productivity can be seen in data with varying rates of increase. Despite the fact that the link between inflation and labor productivity will be negative in 2016, 2018, 2019, and 2021, the relationship between the two will, on average, be a positive one. This suggests that the inflation rate in APEC countries does not have a significant impact on worker productivity, despite increasing and falling during the period of 2016-2021. To ensure that member Countries are able to adjust to shifting inflationary conditions and maintain or improve their labor productivity, it is imperative that APEC countries maintain control over the inflation rate.

5. Findings and Conclusion

According to the findings of the estimations, HDI, FDI, and inflation all have a considerable impact when taken together on labor productivity in APEC member Countries. The Human Development Index (HDI) and Foreign Direct Investment (FDI) both have positive and significant effects on labor productivity in APEC Countries, while inflation has a positive but negligible impact. According to the value of the coefficient, the variable that represents the relationship between HDI, FDI, and inflation is the one that has the most impact on the level of labor productivity in APEC Countries

6. Implications, Limitations and Suggestions

According to the research findings, labor productivity in APEC countries is quite high. HDI, FDI, and inflation are significant factors in labor productivity growth. The findings of this research are in line with labor productivity theory which states that high levels of HDI and FDI both have a positive impact on labor productivity. However, the research findings are not in line with labor productivity theory with the results of inflation having a positive impact on labor productivity. It is anticipated that additional research will add time so that research results can be improved, and it is hoped that the government will recognize the potential for HDI and FDI growth and maintain inflation growth in APEC countries, so that the economies of APEC countries will grow more robustly. This research time period is too short for one variable that does not have a significant effect, namely inflation.

References

- [1] Panennungi M, Pulungsari R, Fitriani E, et al. Analysis of issues development in Asia-Pacific Economic Cooperation. *Asia-Pacific Social Science Review*. 2014;14:1–20.
- [2] APEC in Charts 2021. 2021.
- [3] Muhamad S, Sulaiman NF, Saputra J. The role of human capital and innovation capacity on economic growth in Asean-3. *Jurnal Ekonomi Malaysia*. 2018;52:281–294.
- [4] Sari RD, Oktora SI. Determinan Produktivitas Tenaga Kerja Industri Manufaktur Besar Dan Sedang Di Pulau Jawa. *Jurnal Ekonomi Dan Pembangunan Indonesia*. 2021;21(2):185–203.
- [5] Todaro MP, Smith SC. *Pembangunan Ekonomi di Dunia Ketiga*. Edisi Kedelapan. Jakarta: Erlangga; 2003.
- [6] Liu S. Research on the influencing factors of labor productivity in northeast China. *Proceedings of the 2019 4th International Conference*. <https://doi.org/10.2991/icfied-19.2019.68>
- [7] Sarwar G, Sheikh MF, Rabnawaz I, Sheikh Mf, Rabnawaz I. Factors affecting labor productivity: An empirical evidence from Pakistan. *Journal of Economic Impact*. 2021;3(3):221–226.
- [8] Yildirim Z. Relationship among labour productivity, real wages and inflation in Turkey. *Ekon Istraz*. 2015;28(1):85–103.

- [9] Linda R, Hasyim S, Afifudin S, Et Al. Analysing the structural relationship between labor productivity and investments in Indonesia: An application of two-stage least square. 2020;12:646–662.
- [10] Georgescu MA, Herman E. Productive employment for inclusive and sustainable development in European Union countries: A multivariate analysis. *Sustainability*. 2019;11(6):1771.
- [11] Mnm A, Az M. Quality of human capital and labor productivity: A case of Malaysia. *International Journal of Economics Management And Accounting*. 2015;23:37–55.
- [12] Guansheng Y, Huifang L. The impact of FDI on labor productivity: Short-term and long-term effects. *International Business*. 2013:92–101.
- [13] Newman C, Rand J, Talbot T, Tarp F. Technology transfers, foreign investment and productivity spillovers. *Eur Econ Rev*. 2015;76:168–187.
- [14] Onegina V, Megits N, Antoshchenkova V, Boblovskiy O. Outcome of capital investment on labor productivity in agriculture sector of Ukraine [JEECAR]. *Journal of Eastern European And Central Asian Research*. 2020;7(1):12–25.
- [15] Kizilkaya O, Ay A, Sofuoğlu E. The determinants of high technology product export in Brict countries: An econometric approach. *global journal on humanities and social sciences*. 2016;5:Epub Ahead of Print. <https://doi.org/10.18844/gjhss.v0i0.423>
- [16] Gafarova EA. Dynamics of labour productivity in regions of Russia. *European Proceedings of Social and Behavioural Sciences*. 2021:1040–1046. <https://doi.org/10.15405/epsbs.2021.05.139>
- [17] Dua P, Garg N. Determinants of labor productivity: comparison between developing and developed countries of Asia-Pacific. *Pac Econ Rev*. 2019;24(5):686–704.
- [18] Asada H. Effects of foreign direct investment and trade on labor productivity growth in Vietnam. *J Risk Financ Manag*. 2020;13(9):204.
- [19] Dritsaki C. Real wages, inflation, and labor productivity: Evidences from Bulgaria and Romania. *Journal of Economic & Financial Studies*. 2016;4(5):24.
- [20] Tang C. The effect of real wages and inflation on labor productivity in Malaysia. *Int Rev Appl Econ*. 2014;28(3):311–322.
- [21] Abonazel M, Shalaby O. On labor productivity in OECD countries: Panel data modeling. *Wseas Transactions on Business and Economics*. 2021;18:1474–1488.
- [22] Asghar N, Danish MH, Rehman H. Human capital and labour productivity: A case study of district Lahore. 30.
- [23] Boediono. *Ekonomi Moneter*. Yogyakarta: BPFE Yogyakarta; 1998.
- [24] Nopirin. *Ekonomi Moneter*. 1st ed. Yogyakarta: BPFE; 1987.

- [25] Choi S, Loungani P. Uncertainty and unemployment: The effects of aggregate and sectoral channels. *J Macroecon*. 2015;46:344–358.
- [26] Djirimu MA. Produktivitas Tenaga Kerja Di Indonesia. 2nd ed. Bunga Rampai Rekomendasi Kebijakan Bkf Kementerian Keuangan; 2019.
- [27] Priyono ZI. Teori Ekonomi. Surabaya: Dharma Ilmu; 2016.
- [28] Bps. Indeks Pembangunan Manusia [Indeks Pembangunan Manusia]. Badan Pusat Statistik.
- [29] Ezoji A, Arani AA, Mahdavi MR, et al. The Impact Of Human Capital (Health And Education) On Labor Productivity. A Composite Model Approach: A Case Study Of Iran. *Iran Economic Review*. 2019;23:373–397.
- [30] Ghozali I. Aplikasi Analisis Multivariate Dengan Program Ibm Spss. Edisi Sembilan. Semarang: Badan Penerbit Universitas Diponegoro; 2018.
- [31] Gujarati DN, Porter DC. Basic Econometrics. 5th ed. New York: Mcgraw Hill Inc; 2009.
- [32] Iskandar P. Economics Pengantar Ekonomi Mikro Dan Makro. Edisi Kelima. Jakarta: Mitra Wacana Media; 2013.
- [33] Konya S, Karaçor Z, Küçüksucu M. Panel estimation for the relationship between real wage, inflation and labor productivity for OECD countries. International Conference On Eurasian.
- [34] Li P, Guo M, Wang C, Liu X, Zou Q. An overview of SNP interactions in genome-wide association studies. *Brief Funct Genomics*. 2015;14(2):143–155.
- [35] Dunuwita Liyanage R. Inflation forecasting using automatic ARIMA model in Sri Lanka. *International Journal of Economic Behavior and Organization*. 2023;24: <https://doi.org/10.11648/j.ijeb.20231102.13>; Epub ahead of print.
- [36] Mankiw NG. Macroeconomics. 5th ed. 2002.
- [37] Simanjuntak P. Pengantar Ekonomi Sumberdaya Manusia. Jakarta: Lembaga Penerbit Fakultas Ekonomi, Universitas Indonesia; 1985.
- [38] Soleman R, Ebiyeska H, Wibowo MG, Nainggolan B. The effect of HDI and macroeconomic variables on economic growth in Indonesia 2015-2020. *Jurnal Ilmu Ekonomi Terapan*. 2022;7(1):63–74.
- [39] Soriano B, Garrido A. How important is economic growth for reducing undernourishment in developing countries? *Food Policy*. 2016;63:87–101.
- [40] Sriyana J. Metode Regresi Data Panel. Yogyakarta: Ekosiana; 2014.
- [41] Sukirno S. Makro ekonomi Teori Pengantar. ketiga. Jakarta: Rajawali Pers; 2013.
- [42] Sadono Sukirno. Makro Ekonomi Teori Pengantar. Jakarta: PT. Rajawali Pers; 2016.

- [43] The World Bank. World Bank Open Data. 2021.
- [44] Todaro MP, Smith SC. Pembangunan Ekonomi di Dunia Ketiga. Edisi Kedelapan. Jakarta: Erlangga; 2003.
- [45] Kemenperin RI. Undang-Undang Republik Indonesia Nomor 13 Tahun 2003 Tentang Ketenagakerjaan. 2003.
- [46] Widarjono A. Ekonometrika: Pengantar Dan Aplikasinya. Jakarta: Ekonosia; 2013.
- [47] Wahyudi ST, Khusaini M, Nabella RS. Mengukur Persistensi Inflasi: Studi Komparasi Delapan Kabupaten/Kota Di Jawa Timur. *Jurnal Ekonomi & Kebijakan Publik*. 2021;12(2):117–129.
- [48] Simanungkalit EF. Pengaruh Inflasi Terhadap Pertumbuhan Ekonomi Di Indonesia. *J Manage*. 2020;13(3):327–340.
- [49] BI. Laporan Perekonomian Indonesia. Bank Indonesia; 2022.