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UNVEILING THE IMPACT OF TECHNOLOGICAL ADVANCEMENTS ON MACROECONOMIC STABILITY AND LABOR MARKET DYNAMICS

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Abstract

The rapid development of information and communication technology has an impact on economic growth that is increasingly varied. Economic stability is a basic prerequisite for achieving improvements in people's welfare through high growth and improved growth quality. In line with that, technological progress also has a significant impact on the dynamics of the labor market. The labor market has a mutual relationship between companies and labor. If developing countries want to achieve higher economic development, they must increase trade and physical capital with a stable macroeconomic environment. But on the other hand, technology automatically leads to a decrease in employment and wages. This changes the relative demand for jobs.

Keyword: Technological Advancements; Macroeconomic Stability; Labor Market Dynamics

Introduction

Economic stability is a basic prerequisite for achieving improvements in people's welfare through high growth and improving the quality of growth. Economic stability is very important to provide business certainty for economic actors. Macroeconomic stability is achieved when the relationships of the main macroeconomic variables are in balance, for example between domestic demand and national output, the balance of payments, fiscal revenue and expenditure, and savings and investment. These relationships do not always have to be in a very precise balance. Fiscal and balance of payments imbalances, for example, remain compatible with economic stability as long as they can be financed on a sustainable basis.

In line with that, technological advances also have a significant impact on the dynamics of the labor market. Technological development in the era of the fourth industrial revolution is like two sides of a coin. On the one hand, it opens up opportunities for progress and prosperity. But on the other hand, machines and automation are replacing the role of low-skilled labor (Saragih, 2019). The labor market has a mutual relationship

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between companies and labor. So it can be said that companies need labor in accordance with market demand and this is commonly known as drived demand. It is assumed that the market in the economic system if the entrepreneur is not able to influence the price, but on the one hand the company is said to be able to determine the price (price taker) (Putri & Idris, 2020).

Technology is a human science about how to solve problems regarding meeting needs, fulfilling desires, by combining resources to produce goods, including raw materials, tools, methods, processes, techniques, methods, and skills. Technology is also the development of a medium whose use is more practical and more efficient to facilitate all human activities (Setiawati & Al Qoodir, 2021). Technology is the hallmark of human nobility, as it proves that humans cannot live just to eat, but need more than that. Technology can activate the non-material components of human life, feelings, thoughts, minds, intuition and ideals (Adiwijaya, 2018).

The rapid development of information and communication technology has an impact on economic growth that is increasingly varied. Dianari (2018) calls this phenomenon the New Economy which is a term for the birth of a new economic structure as a result of the development of information and communication technology. Technology is the most important factor to drive the industry. Technological advances will make changes in production processes and methods as a result of innovation and renewal or new techniques. Technological changes will increase productivity. Increased productivity will have an impact on the division of labor and the expansion of the scale of production, thus creating specialization, and ultimately can bring changes towards large-scale production efforts (Setiawati & Al Qoodir, 2021).

Advances in information and communication technology have a positive and significant role in economic development in developing countries. Developed countries have a more stable macroeconomic environment than developing countries, so macroeconomic stability plays a more important role for developed countries. If developing countries want to achieve higher economic development, they must increase trade and physical capital with a stable macroeconomic environment (Audi, Marc, Amjad, 2019). Developing countries must adopt advances in information and communication technology (ICT) to compete with developed countries in the process of economic stability.

In today's life, technological progress is inevitable, because technological progress will follow the changes and developments of the times. Technology is the real proof of scientific progress. The innovations created can provide positive benefits for human life. Convenience in human activities is a new way technology plays a role in human activities. Therefore, this article discusses the impact of technological progress on macroeconomic stability and labor market dynamics.

Research Method

This article uses a mixed research approach, namely quantitative and qualitative. The quantitative approach is the process of collecting and analyzing data numerically to answer questions and test predetermined hypotheses. While the qualitative approach is theory testing by analyzing data sources derived from literature studies. The data collection process by the author involves a comprehensive review of scientific literature, including journals that have been reviewed by experts and authoritative books. The sources used in this study are not only limited to domestic publications, but also include international literature and research findings.

The initial step in the data analysis process involved data reduction, which involved data classification and subsequent selection to simplify the data that had been identified. The author then proceeded to the second stage, which involved a careful review of the data results obtained and strategically highlighting important elements to be further organized into a coherent text narrative. In the next stage, after identifying the main gist of the data obtained through a comprehensive literature review, the author composes a coherent narrative that aims to gain conclusive insights and validate them as potential solutions to the issues raised in the article.

Discussion

Unveiling the Impact of Technological Advancements on Macroeconomic Stability

A country is considered successful or not in solving its own economic problems can be seen from the macro and micro economy of the country. Macroeconomics is the study of activities that discuss the economy of a country. One of the macroeconomic indicators used to measure the stability of a country's economy is inflation. Changes in this indicator will have an impact on the dynamics of economic growth. In an economic perspective, inflation is a monetary phenomenon in a country where the rise and fall of inflation tends to cause economic turmoil. Inflation is a phenomenon in which the general price level increases continuously. An increase in the price of just one or two goods cannot be said to be inflationary unless the increase is widespread or results in price increases in other goods.

Global economic conditions in November 2022 were still under pressure from high inflation, reflected in the realization of inflation in the Euro Area, the United States, and Peru. In addition, based on UN FAO data, global food prices also surged by 27.3 percent, influenced by weather factors, the energy crisis, and the surge in fertilizer prices (Kemenkeu, 2022). These two things add pressure to consumers and governments around the world that inflation control policies are very important, especially to maintain the socio-economic conditions of the community and a stable economy. Here is a summary of country inflation:

Table 1
Country Inflation Summary

Country	Q3 Growth (YoY)	Description (Influencing Factors)
Euro Area	4,9%	Driven by energy scarcity and rising electricity prices. Even core inflation, which excludes volatile components such as food and energy, also increased to 2.6 percent (YoY).

United States	6,8%	Driven by surging prices for energy, shelter, food and vehicles. People also faced higher costs for basic necessities, namely: Food, up 6.4 percent (YoY), the highest since December 2008. Gasoline, up 6.1 percent (m-to-m) and matching the increase in October, the highest since March 2021. Residential rent surged to 3.8 percent (YoY), the highest since 2007.
Mexico	7,4	This is more than double the central bank's target of 3.0 percent and the highest pace since early 2001. In addition, this condition will also encourage an increase in the benchmark interest rate this week and become the fifth consecutive increase throughout 2021.

Source: CEIC, 2023

With inflation, an increase in the inflation rate indicates economic growth, but in the long run, a high inflation rate has a very bad impact. With the high inflation rate, this causes domestic goods to be relatively more expensive when compared to the price of imported goods (Ramadani, et al., 2021). If we see that in principle not all inflation has a negative impact on the economy. Especially if there is mild inflation, namely inflation below 10%, with this mild inflation can encourage economic growth. This is what encourages entrepreneurs to further increase their production by opening new jobs. Macroeconomic inflation in Indonesia in Oktober 2023 is as follows:

Table 2
Macroeconomic Inflation in Indonesia in Oktober 2023

	Inflation	**Inflation Share**
General Inflation	**2,56**	**2,56**
Food, Drinks and Tobacco	5,41	1,39
Clothing and Footwear	0,85	0,04
Housing, Water, Electricity and Household Fuel	1,16	0,23
Supplies, Equipment and Routine Household Maintenance	1,89	0,11
Health	2,04	0,05
Transportation	1,20	0,16
Information, Communication and Financial Services	0,11	0,01
Recreation, Sports and Culture	1,50	0,03
Education	1,00	0,11

Provision of Food and Beverage/Restaurant	2,21	0,20
Personal Care and Other Services	3,67	0,23

Source: Badan Pusat Statistik, 2023

In October 2023 there was year on year (y-on-y) inflation of 2.56 percent with a Consumer Price Index (CPI) of 115.64. The highest inflation occurred in Tanjung Pandan by 5.43 percent with a CPI of 120.87 and the lowest occurred in Jayapura by 1.43 percent with a CPI of 112.88. Y-on-y inflation occurred due to an increase in prices as indicated by the increase in all expenditure group indices, namely: food, beverages and tobacco group by 5.41 percent; clothing and footwear group by 0.85 percent; housing, water, electricity, and household fuel group by 1.16 percent; household supplies, equipment and routine maintenance group by 1.89 percent; health group by 2.04 percent; transportation group by 1.20 percent; information, communication, and financial services group by 0.11 percent; recreation, sports, and culture group by 1.50 percent; education group by 1.99 percent; food and beverage supply/restaurant group by 2.21 percent; and personal care and other services group by 3.67 percent.

The month to month (m-to-m) inflation rate for October 2023 was 0.17 percent and the year to date (y-to-d) inflation rate for October 2023 was 1.80 percent. The y-on-y inflation rate of the core component in October 2023 was 1.91 percent, m-to-m inflation was 0.08 percent, and y-to-d inflation was 1.54 percent (BPS, 2023)

Most indicators of global economic activity showed positive momentum. The global Purchasing Managers Index (PMI) for example, edged up to 54.3 for the Manufacturing PMI, while the Services PMI increased to 55.6. Both recorded output growth with the services sector outperforming manufacturing. Supply constraints that plagued the manufacturing sector are again evident especially in the United States and Europe. Supply delays and backlogged of works are still on the rise. Among the many drivers of inflation, energy prices are the main culprits (Bappenas, 2021).

Although energy commodity prices declined in November 2021 due to strong commitments from the United States, Russia, and China to increase supply. Energy prices still remain at high levels compared to 2020. Inflation in November 2021 accelerated with an inflation rate of 0.4 percent (m-to-m). This development was driven by price increases in all expenditure groups, especially the food, beverage and tobacco group (Bappenas, 2021).

Technological advances also have a significant influence on macroeconomic stability. The importance of the influence of technology on economic growth has been an important study since long ago, Romer, who is the originator of endogenous economic theory, argues that technological flows can encourage investment so that capital will increase, in addition to investment, the increase in technology also has an impact on cultural exchange, especially in the field of education because sophisticated technology must be supported by qualified human resources so that the use of technology in the production process becomes effective and efficient (Setiawati & Al Qoodir, 2021).

Technology is a projection of the flow of investment, trade and effectiveness in production. Technological growth encourages international trade and foreign investment into the country because it is almost impossible for a country to meet its technological needs independently. In addition, technological growth will encourage effectiveness and efficiency in production because technology will produce acceleration in the production process. With technological advances, a country can produce products/services needed by its population, and technology can improve the quality and quantity of goods/services more effectively and efficiently, so that the products/services produced can compete with other countries. The impact of technology on the economy, making high productivity (greater output), increased product quality, diverse new product variations, and modern product innovations.

Technology greatly affects a country's economy. The economy is measured through economic growth or the value of GDP and GDP per capita. Technologically advanced and modern countries, their economic growth rate is always positive and stable, although they experience negative growth, but the gap is not too large. GDP per capita is very high, and this is a criterion for developed countries in terms of GDP per capita.

Unveiling the Impact of Technological Advancements on Labor Market Dynamics

The labor market has a mutual relationship between companies and labor. So it can be said that companies need labor in accordance with market demand and this is commonly known as driven demand. It is assumed that the market in the economic system if the entrepreneur is unable to influence the price, but on the one hand the company is said to be able to determine the price (price taker). Labor supply is the amount of labor provided by labor owners for possible wages that have been offered at a certain period of time (Putri & Idris, 2020). The individual has the right to decide whether they want to work or not and they can determine the hours they want to work. Here is the average size of the labor force in February 2023.

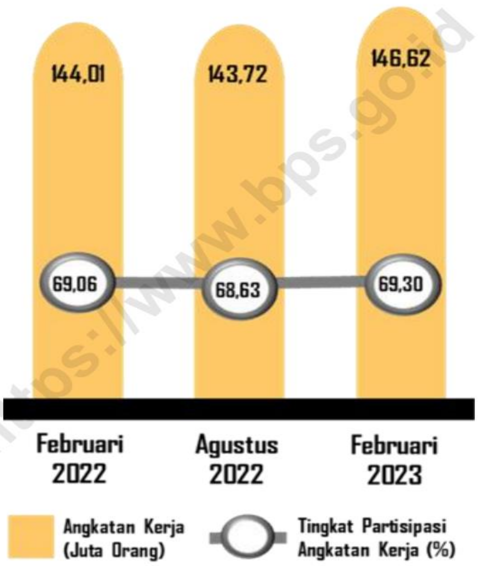

Figure 1: Total Labor Force 2022-2023

The Sakernas results for February 2023 showed an increase of 2.61 million people aged 15 years and over who were included in the labor force compared to February 2022. When compared to August 2022, the total labor force also increased from 143.72 million people to 146.62 million people in February 2023. Along with the increase in the number of labor force, the TPAK in February 2023 also increased compared to February 2022.

In a study conducted by Michael Webb (2019) predicts that technology will have a significant impact on employment. He determined that automated technology has an impact on decreasing employment and wages. New technologies create winners and losers in the labor market. This changes the relative demand for jobs. The concept of technology is central to macroeconomic analysis (Kristin Dell & Nestoriak, 2020). In the standard macroeconomic growth model, labor and capital are the main factors of production that generate economic value.

The utilization of technology has the potential to increase the effectiveness and efficiency of the workforce in various industries and thus has the potential to increase the productivity of the workforce within the company. One illustration of this concept is the utilization of time management software, which empowers individuals to effectively structure their work schedules and optimize their time utilization to increase productivity. In addition, the application of technological tools, such as reminder systems and scheduling applications, can effectively assist the workforce in managing the organization and reduce the adverse impact of heavy workloads.

In other cases, the introduction of automation and digitalization in the economy can take away all control and lead to job losses and generate structural changes that contribute to an increase in structural unemployment. The introduction of automation can replace the role of labor in various industries. Some jobs that are simple and basic in nature are at high risk of being replaced by technology. The potential impact of technological advances, such as automation and robots, on employment in Indonesia in the next two decades is noteworthy. According to the International Labor Organization (ILO), about 56 percent of jobs in Indonesia, equivalent to about 60 million jobs, are considered threatened by significant automation. The potential for job change by machines and technology does not only occur in traditional or manual labor but also has the potential to replace repetitive administrative work (Cahyaningtyas, Afinsha S., et al. 2023). This has resulted in a phenomenon known as job polarization, where there is a decline in jobs that require middle-level skills.

Technology is essentially neutral and plays a very important role in the development of human civilization. New technologies need not be feared as mankind has coexisted with machines and automation processes since the first industrial revolution, but it is necessary to be wary of them. Globalization is inevitable, the large population and consumption base, strategic geographical position for trade, and business-friendly government have attracted many multinational companies to invest in Indonesia. These investors bring new technologies that have never existed in Indonesia before, and are bound to cause disruption. The positive impact is to push Indonesia to achieve new progress and leave behind (Saragih, 2019). Meanwhile, the negative impact is that

Indonesian industries and human resources that are not ready to adopt and adapt to these technologies will experience industry shock and manpower shock. A large but low-quality or standard population will face many problems in the future.

Conclusion

Advances in information and communication technology have a positive and significant role in economic development in developing countries, especially Indonesia. Developed countries have a more stable macroeconomic environment than developing countries, so macroeconomic stability plays a more important role for developed countries. If developing countries want to achieve higher economic development, they must increase trade and physical capital with a stable macroeconomic environment. But on the other hand, automated technologies have the effect of reducing employment and wages. New technology creates winners and losers in the labor market. It changes the relative demand for jobs. The concept of technology is central to macroeconomic analysis. In the standard macroeconomic growth model, labor and capital are the main factors of production that generate economic value.

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