

# Technology Development, Net Exports and National Productivity

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## Abstract

This study aims to understand the development of technology, net exports and national productivity. This study uses secondary data from world banks and processed regression using the moving average autoregression method. We find that technology is positively related to gross domestic product and net exports is negatively related to gross domestic product which is an indicator of national productivity. Based on the estimation, technology development or technology investment in Indonesia tends to be import-based so that it suppresses net exports and results in a decrease in net exports in line with technology development, even though technology investment in the form of high technology development encourages economic growth.

**Keywords:** Technology, Indonesia, Consumption

**JEL Classification:** C0, J24, J64

## Background

Indonesia with a very large population certainly needs something to meet its needs, for example the need for food and shelter (Madduppa et al,2021). To meet the needs of all the people and distribute them is a strong reason to develop technology in order to increase production.

Products produced do not have to be sold domestically. Production results can be sold in the international market so that you get cash inflow which can be used to increase domestic production (Bingemer et al,2021).

This study aims to understand the development of technology, net exports and national productivity. We use the Solow hypothesis that technology can drive production by increasing the performance of human resources so that they can produce more, better and faster.

## Literature review

Production is one of the economic activities in improving people's welfare and increasing national productivity. One of the efforts to increase production is technology. Technology plays a role in helping humans to work and carry out activities, including production. With technology, production can be faster with better production results (Vinardell et al,2020).

National productivity can be indicated by gross domestic product. Productivity can be defined as the level of national production performance where this is the gross domestic product. Because gross domestic product is the total economic value of all goods and services produced nationally. Based on this, the gross domestic product can be used as an indicator of national productivity (Ockert,2021).

Production results in addition to meeting domestic needs can also be used to meet foreign needs so that exports and imports occur. Net exports represent the difference between exports and imports (Tiryaki,2019).

## Research methods

This research studies Technology Development, Net Exports and National Productivity. This study uses secondary data from world banks and processed regression using the moving average autoregression method with the following equation:

$$GDP_t = C_t + \beta_1 TI_{t1} + \beta_2 NX_{t2} + e_t$$

Where,

GDP = Gross Domestic Product

C = Constant

IT = Technology

Nx = Net Exports

e = Error Term

All financial data is calculated in USD.

## Results and Discussion

The estimation results are as follows:

$$GDP = 452906478444 - 5.75019067247 * NX + 288.390353667 * TI$$

From the estimation results, technology (IT) is positively related to gross domestic product (GDP) and net exports (Nx) is negatively related to gross domestic product (GDP) which is an indicator of national productivity. Based on the estimation, technology development or technology investment in Indonesia tends to be import-based so that it suppresses net exports and results in a decrease in net exports in line with technology development, even though technology investment in the form of high technology development encourages economic growth. Table 1 illustrates the estimation results as follows:

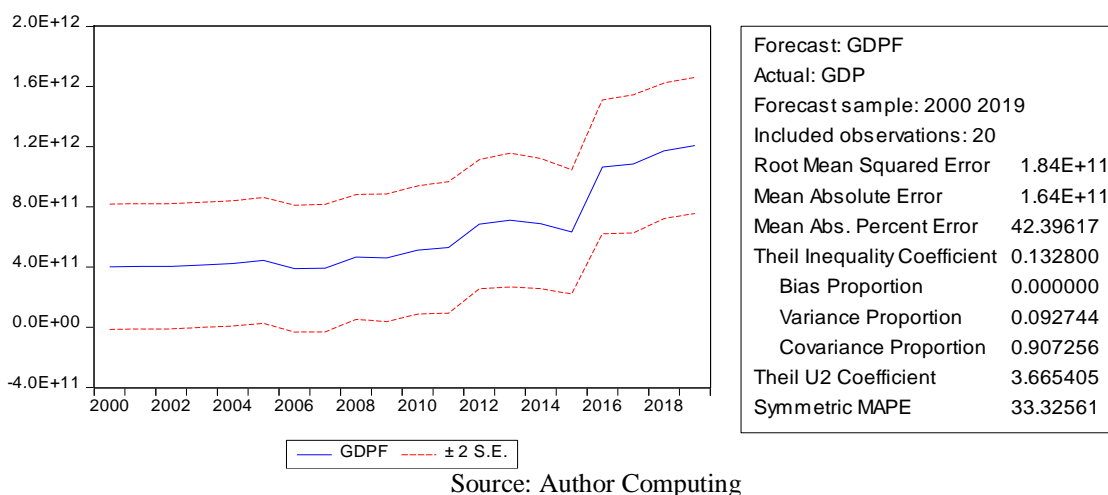
**Table 1.** Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.53E+11	9.64E+10	4.698714	0.0002
NX	-5.750191	5.394142	-1.066006	0.3013
TI	288.3904	60.23616	4.787662	0.0002
R-squared	0.689322	Mean dependent var		6.24E+11

Adjusted R-squared	0.652772	S.D. dependent var	3.39E+11
S.E. of regression	2.00E+11	Akaike info criterion	55.01842
Sum squared resid	6.80E+23	Schwarz criterion	55.16778
Log likelihood	-547.1842	Hannan-Quinn criter.	55.04757
F-statistic	18.85954	Durbin-Watson stat	0.332155
Prob(F-statistic)	0.000048		

Based on the estimation results described in Table 1., it can be seen that the R-square is quite low, namely 0.689322 so that the quantitative calculation results show the level of truth is only 68%. Figure 1. Shows the forecasting of economic growth in Indonesia.

**Figure 1.** Forecasting Economic Growth in Indonesia



From the forecasting results, it can be seen that economic growth in Indonesia is experiencing growth but not too fast by taking into account technology development and net exports in the process of building forecasting economic growth. Technology development or technology investment in Indonesia tends to be import-based so that it suppresses net exports and results in a decrease in net exports along with technology development, although technology investment in the form of high technology development encourages economic growth, but economic development from imported technology or imports of domestic technology development needs does not encourage rapid economic growth as shown in the forecast in Figure 1.

## Conclusion

Technology development or technology investment in Indonesia tends to be import-based so that it suppresses net exports and results in a decrease in net exports along with technology development, even though technology investment in the form of high technology development encourages economic growth. However, economic development from imported technology or imports of domestic technology development needs. does not promote rapid economic growth with a success rate of only around 68%.

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