Current Science Research Bulletin
Volume 02 (04), April 2025, pp. 126-132
CrossRef DOI: 10.55677/csrb/05-V02I04Y2025
Available on: https://csrbjournal.org/index.php/csrb
e-ISSN: 3050-7103
p-ISSN: 3050-709X

An Analysis of the Effect of Consumption Spending, Investment, Export and Volatility on Indonesia Economic Growth

Saidi, La Ode
Department of Mathematics, Faculty of Mathematics and Natural Science, Universitas Halu Oleo, Kendari 93232, Indonesia.

ABSTRACT: The aim of this study is to examine the effect of consumption spending, investment, export, and volatility on economic growth in Indonesia. This study used quarterly time series data covering consumption spending, investment, and GDP as a proxy for economic growth. The time series data span from the first quarter of year 2000 to the fourth quarter of year 2013. The results of EGARCH-M test show that consumption spending, export and volatility have effect on Indonesia's economic growth Indonesia, whereas investment does not affect the economic growth.

KEYWORDS: Consumption spending, investment, export, volatility, EGARCH-M Model.

1. INTRODUCTION

Economic growth constitutes the economic problem of a country in the long term towards a better situation over a period of time and can also be linked as a condition of an increase in the production capacity of the economy that is realized in the form of increased national income. Economic growth is an indicator of the success of economic development. According to Mankiw (2007), in a macro-analysis the measurement of a nation's economy is Gross Domestic Products (GDP) which measures the flow of income and spending in the economy of a nation over a set period of time. In a four-sector economy, to achieve national income equilibrium, the formula Y = C + I + G + (EX-IM) can be employed where Y is national income, C is consumption, I is Investment, G is government spending, while EX and IM represent export and import respectively.

According to Tri (2019), in spite of the global economic slowdown during the year 2016, Indonesia's economic growth was among the highest in the world at 5.04 per cent on average in the third quarter of year 2016. There are several issues that affect Indonesia's economic growth and economic development such as (1) the role of the State Revenue and Expenditure Budget (SREB) which is not yet optimal, (2) high rate of unemployment, (3) improper management of natural resources, (4) inflation rate (5) poor implementation of transmigration program (6) lack of infrastructures, and (7) investment in the manufacturing sector. Arrow and Kurz (1970), Barro (1990), and Ghani and Din (2006) point out that public investment can determine the long-term economic growth through the provision of education, health, basic scientific research and physical infrastructure.

In addition, consumption factors also influence economic growth. An important value that can be used to see the effect of consumption on economic growth of a country is national income (GDP) because it is the final value of goods and services produced by various production units in the territory of a country within a year. In a two-sector economy, economic growth is directly proportional to household consumption, meaning that if consumption declines then economic growth also decreases. So, expenditures made by consumer households are used to buy various needs in a given year. In addition to changes in consumption, another factor that has influences on economic growth is investment (Sukirno, 2003; Alesina *et al*., 2005; Stakove, 2018)

Sustainable economic growth that is sustained by investment is considered to be able to increase productivity so as to help boost economic growth. The global economic crisis that hit most countries worldwide including Indonesia pinpoints that equilibrium in the economy of a country could not rely only on the private sector but could also on the government sector as its contribution is also very reliable. This is particularly government spending, government investment that can create jobs and net exports that can increase national income (Kuncoro, 2004; Ernita *et al*., 2013).

Several studies on the effect of investment and exports on economic growth in developed countries and developing countries including Indonesia have been carried out, among others, Khan and Reinhart (1990), Sinha (1999), and Amir (2004). These studies advocate the importance of increasing exports and investment to spur economic growth and therefore suggest that exports and investment play an important role in the economic activities of a country. Exports will generate foreign exchange that is used to finance imports of raw materials as well as capital goods needed in the production process to create added value. The

Corresponding Author: Saidi, La Ode

aggregation of added value produced by all units of production in the economy is the value of Gross Domestic Product. Therefore, a high and sustainable level of economic growth is generally supported by an increase in exports and investment. The lack of recovery in investment is indicated by the declined share of investment in GDP, mainly experienced by the most important sectors in the Indonesian economy such as processing, agriculture and mining.

There are plenty of factors that are interrelated with each other with a very complex pattern causing the slow recovery of investment in Indonesia until today. These factors concern not only political and social stability, but also economic stability and basic infrastructure conditions (electricity, telecommunication, road and port infrastructure). They also include the functioning of the financing sector and the labor market (including labor issues), regulation and taxation. Moreover, there are factors such as bureaucracy (in the time and costs created), issues of good governance including corruption, consistency and certainty in the government policies that directly or indirectly affect the net profit of long-term risk costs of investment activities and ownership rights from land to contract. The investment is largely influenced by interest rates and gross domestic product (GDP).

Ghani and Din (2006) and Rafiy *et al*. (2018) find out that the role of public investment in growing economy is largely driven by private investment. Furthermore, they revealed that there is no strong inference can be drawn from the effect of public investment and public consumption on economic growth.

This study aims to examine the effect of consumption spending, investment and export on economic growth in Indonesia by means of GARCH-in-Mean model (Engle *et al*., 1987) and Exponential GARCH (Nelson, 1991). The combination of the two models is called the Exponential GARCH-in-Mean model or simply EGARCH-M for short (IHS, 2017).

2. LITERATURE REVIEW

2.1. Economic Growth

Economic growth can be defined as an increase in the production of goods and services (Akbulaev & Muradzada, 2023). An indicator that can be used to measure economic growth is the rate of Gross Domestic Product (GDP) growth which measures the total income of everyone in the economy (Mankiw, 2007). GDP is a total income and total national expenditure on the output of goods and services for a certain period. This GDP can reflect economic performance, and it can be said that the higher the GDP of a country the better the economic performance the country has. A high GDP will have impact on increasing the community's income, which in turn will lead to an increase in demand for goods and services. As a consequence, the company will gain more profits and more investments will be encouraged. In other words, in the long term if GDP increases, then investment will also increase (Pratama, 2004).

According to Smith (1977) economics systematically studies human behavior in an effort to allocate limited resources to achieve certain goals. In his book, he briefly often referred to as Wealth of Nations, and he argued about the process of economic growth in the long-term systematically. There are two main aspects in economic growth. The first is total output growth (GDP) and the other is population growth. In output growth, He recognizes that a country's production system consists of three main elements: (a) available natural resources (or land production factors), (b) human resources (population) and (c) stock of existing capital goods. Smith contends that the available natural resources are the most basic means of a society's production activities. The amount of available natural resources is the maximum limit for an economic growth. It means that as long as these resources have not been fully utilized, the two other production elements namely population and the existing stock of capital play a role in the production process. These two elements determine the amount of public output from year to year. However, if output continues to increase, natural resources will eventually be fully exploited and at this stage natural resources will limit output. This element of natural resources will be the upper limit of growth of an economy. Economic growth (in terms of output growth and population growth) will stop if this upper limit is reached.

2.2. Investment

According to Nuraini (2005) there are two main objectives of investment, namely to replace the part of damaged capital supply (depreciation) and add the provision of existing capital (net investment). There are three types of investment expenditures namely business fixed investment, residential investment and inventory investment. Fixed business investment includes equipment and structures that a company buys for the production process. Residential investment includes new house purchased for housing and houses purchased by landlords for rent. Inventory investment includes items stored by a company in warehouses such as inventory materials, work-in-progress and finished goods.

Development planning will basically be determined by the ability to provide funding sources to be invested in order to achieve the level of growth and welfare to be achieved. The concept of Incremental Capital Output Ratio (ICOR) commonly used to analyze this. ICOR is a comparison figure that provides information about how much investment is required to raise economic output. Harrod-Domar's theory is a theory developed separately in the same period by E.S. Domar and R.F. Harrod, views the

Corresponding Author: Saidi, La Ode

importance of investment in economic growth since it would rise the stock of capital goods which enables an increase in output. Domestic sources of funds for investment purposes come from the production (national income) saved (Mankiw, 2007). This is consistent with M'Amanja and Morrissey (2006) who found that investments, private share, public and import have a beneficial effect on per capita income and eventually on GDP. However, aid in the form of an external loan net was found to have a significant negative impact on long-term economic growth in Kenya.

2.3. Consumption Spending

Samuelson and Nordhaus (1998) says that consumption is the largest single component of GNP and makes up 66 percent of total expenditure in the past decade. The main components of consumption categorized to be important are housing, motorized vehicles, food and community services. According to Keynes (2005) consumption decisions are divided into two: 1) consumption decisions are crucial for short-term analysis because of their role in economic growth, 2) consumption decisions are crucial for short-term analysis because of its role in determining aggregate demand. Consumption is two-third of GDP and that is why fluctuation in consumption forms an important element of the economic boom and recession. Samuelson (2005) further explains that one of the most important relationships in the overall macroeconomy is that consumption function shows the relationship between the level of consumption expenditure and the level of individual disposable income.

There are two main factors affecting consumption spending. The first factor is disposable income. Consumption is closely correlated with disposable income. The only period in which income and consumption did not move with the same pattern was during the Second World War in which goods were so scarce that they had to fall, and people were encouraged to save money to help the country in financing war. The second factor is permanent income. The simplest consumption theory only considers current income levels. A carefully done estimation shows that people do not only base their consumption expenditure on current income but also on long-term trends. As it is known earlier, government spending through the SREB is reflected in the realization of the routine expenditure budget and realization of the development budget. Meanwhile the total revenue covers domestic revenues and foreign revenues, known as development receipts. Based on its objectives, routine expenditures are operational expenses that are absolutely conducted and consumptive in nature. However, not all routine expenditures can be categorized as current expenditure, for example purchases for office inventory, expenses for office building maintenance and so on. Consumption spending are state routine expenditures which include employees expenditures such as salary, pension and allowance and domestic goods expenses as well as regional routine funds and other routine expenditures that cause the goods consumption of employees or the public to rise which lead to an increase in consumption function. This eventually contributes to national gross contribution and economic growth (Ali *et al*., 2014).

2.4. Export

According to Mankiw (2007) export is one of the indicators in foreign trade that can provide foreign exchange and increase national income which will push economic growth, whereas import has the opposite effect. Export can occur when there is a commodity that is not produced in another country while it is needed or export can occur when a country is able to produce a commodity that can compete in international market (Irawan and Suparmoko, 2003). Exports can also be done when a country can produce goods that have special advantage. If this is the case then export will increase. There are various factors that can determine export, among other things are the ability of a country to produce competitive goods in international market and the ability of a country to produce goods that cannot be produced abroad.

The export development of a country is not only determined by comparative advantage factor but also by competitive advantage factor. The core of the competitive advantage paradigm is the superiority of a country in global competition in addition to being determined by comparative advantage, it has and protection or facility assistance from government, also determined by its competitive advantage. Competitive advantage is not only owned by a country, but also by companies in a country either individually or in groups. Another difference with comparative advantage is that competitive advantage is more dynamic with changes, for example technology and human resources (Tambunan, 2001). Comparative advantage theory was developed by David Ricardo to complement Adam Smith's theory which does not question the possibility of countries that have no absolute advantage at all in producing goods for other countries, for instance developing countries for developed countries. To complement the weaknesses of Adam Smith's theory, Ricardo distinguishes trade into two different category namely domestic trade and foreign trade.

According to Ricardo, the absolute advantage put forward by Adam Smith can apply in domestic trade carried out on the basis of labor costs due to the free competition and mobility of production, labor and capital factors. Therefore, each country will specialize in producing certain goods if they have the lowest labor costs. Meanwhile, foreign trade cannot be based on absolute profit or cost. This is due to inability of factors of production in foreign trade to move freely so that goods produced by a country could possibly be exchanged for goods from other countries even though the labor costs required to produce the goods are different.

Corresponding Author: Saidi, La Ode

Thus, the core of comparative advantage can be stated as follows: that a country will specialize in producing more efficient goods for which the country has a comparative advantage (Budiono, 2008).

3. DATA AND METHODOLOGY

3.1. Data

The time series data used in this study consist of three types: net investment (INV), export (EXP) and gross domestic product (EGR), all of which are quarterly time series data that span within the period of 2000Q1-2013Q4. EGR is used as a proxy for economic growth. CON unit is Billion rupiah, INV is US Dollar and EXP is billion rupiah (IDR). The source of data is Federal Bank of St Louis, United States.

3.2. Methodology

This study aims to examine the effect of consumption spending (CON), investment (INV) and export (EXP) and also volatility on economic growth (EGR). Hence, in the specification of analysis model, EGR is the dependent variable, while CON, INV, EXP are independent variables.

To test the effect, the model used was a compound model between GARCH-in Mean model (Engle *et al*., 1987) and Exponential GARCH model (Nelson, 1991). The combination of the two models is called Exponential GARCH in Mean model or abbreviated as EGARCH-M (IHS, 2017). The EGARCH-M model specification (p, q, r) which states the relationship between consumption, investment, export, votality and economic growth is as follows

$$\mathrm{EGR_t} = \alpha_1 + \alpha_2 \mathrm{CON_t} + \alpha_3 \mathrm{INV_t} + \alpha_4 \mathrm{EXT_t} + \alpha_5 \sqrt{\mathrm{H_t}} + \varepsilon_t \quad (1)$$

$$Log(H_t) = w + \sum_{i=1}^{p} \beta_i \left| \frac{\varepsilon_{t-i}}{\sqrt{H_{t-i}}} \right| + \sum_{j=1}^{q} \gamma_j \, log\left(\sqrt{H_t}\right) + \sum_{k=1}^{r} \delta_k \frac{\varepsilon_{t-k}}{\sqrt{H_t}} \quad (2)$$

In the equation (1), α_i $(i = 1, 2, 3, 4, 5)$ are the parameters of the regression equation, and ε_t error with mean 0 and H_t variance where ε_t is independent and is normally distributed with mean 0 and variance H_t. Menawhile, in the equations (2), w, β_i $(i = 1, \dots, p)$, γ_j $((j = 1, \dots, q)$, and δ_k $(k = 1, \dots, r)$ are the parameters of variance equation. The equation (1) and (2) specify a one-way relationship from consumption, investment, export, and votality $(\sqrt{H_t})$ to economic growth.

To test the effect of consumption spending, investment and export and also volatility on economic growth, the steps taken were first estimating the parameters of equations (1) and (2) using the Maximum Likelihood method, and second, checking the residual assumptions (autocorrelation, homochedasticity and normality). To check autocorrelation, homochedasticity and normality, the tests of statistics-Q, Arch and Jarque Berra were used.

4. EMPRICAL RESULTS AND DISCUSSION

4.1. Empirical Results

As stated in sub-section 3.2 that the first step taken to examine the effect of consumption, investment, and export expenditures as well as volatility on economic growth was by estimating the equation (1) and (2) using Maximum Likelihood method. Based on the information criteria of Akaike Information Criterium (AIC), the lag length of the model (1) and (2) is p=q=r=1 so the EGARCH-M model estimated is the EGARCH-M(1,1,1) model. The estimation results are presented in Table 1.

Table 1. Estimation Results of EGARCH-M (1,1,1) Model

Variables, intercept, dan coefficient of variance equation	Coefficient	z-statistics	Prob.
A. Multiple linear regression equation			
CON	1.755029	60.28967	0.0000
INV	-1992.335	-0.564812	0.5722
EXP	3356.741	5.784307	0.0000
$\sqrt{H_t}$	-1.511662	-3.239776	0.0012
C	-9.36E+13	-6.317296	0.0000
B. Variance Equations			

Corresponding Author: Saidi, La Ode

W	61.06432	44.51781	0.0000
β_1	-0.693997	-2.354002	0.0186
γ_1	0.007640	0.318911	0.7498
δ_1	-0.618644	-2.579126	0.0099

From Table 1, it appears that the variable coefficients CON, EXP, and $\sqrt{H_t}$ are significant at 1%, while INV variable coefficient is not significant. This means that there are effects of consumption spending, export and volatility on Indonesia' economic growth. On the other hand, there is no effect of investment on economic growth. This conclusion is valid as it is based on the results of the residual diagnostic tests as given in Table 2, the null hypothesis of the three tests: Q-statistics, Arch, and Jarque Berra are accepted or in other words, while the EGARCH-M (1,1,1) model residual does not have autocorrelation, it is homochedastic and normaly distributed.

Table 2. Residual Diagnostic Test

Name of Assumption	Statistic Test	Values of Statistic Test	Prob
Autocorrelation	Q-statistic	1.6080*	0.807
Homochedasticity	Arch	0.1207**	0.7283
Normality	Jarque Berra	0,1557	0.925

Note: * Q-statistic value in lag 4, ** Arch statistic value based on the distribution of χ^2 in lag 1

In Table 2 of residual diagnostic test, it can be seen that with Q-statistic test, there is no autocorrelation in the residual. Meanwhile, the homochedasticity test using Arch test shows that the error standard is homochedastic with a P value of 0.7283 whereas normality test using the Jarque Berra test shows that the error standard is normally distributed with a P value of 0.925.

4.2. Discussion

4.2.1. The effect of Consumption on Economic Growth

From the testing of hypothesis, the results are obtained that consumption has a significant positive effect on economic growth. This is proven by the significant value which is 0,000 <1%, as well as by the coefficient value of CON (consumption) variable. This is due to the increase in consumption and it means that there is a rise in the demand for goods and services. The rise in the production of goods and services will lead to increased economic growth. In contrast, if the development of consumption falls, economic growth will also decline. This decline will cause the economy to reduce the production of goods and services. The result of this study has, therefore, been in line with Mankiw's view (2007) which reveals that consumption decisions are very crucial for short-term analysis. It also agrees with Samuelson's theory (2005) that the consumption function shows the relationship between the level of consumption spending and the level of individual disposable income.

4.2.2. The effect of Investment on Economic Growth

Furthermore, from the testing of hypothesis, it is obtained that investment does not have a significant positive effect on economic growth, because the p-value investment variable (0.5722) >1%, 5% or 10%. It shows that economic growth is not influenced by the development of investment.. So, the rise in investment will not cause an increase in the production of goods and services in the economy. This study has been in conflict with those of Arrow and Kurz (1970), Barro (1990), and Ghani and Din (2006) which revealed that the public investment can determine long-term economic growth through the provision of education, health, basic scientific research and physical infrastructure.

4.2.3. The Effect of Export on Economic Growth

As it has been stated earlier, this study aims to find out the simultaneous effect of export on economic growth. Based on the data analysis and hypothesis testing carried out in this study, a significant value of 0,000 <1% is obtained. This indicates that export simultaneously has a significant positive effect on the economic growth. The result of this study has also been in accordance with the theory developed by Tambunan (2001) that economic growth from the side of aggregate demand (use of GDP) consists of four components namely household consumption (C), gross domestic investment (fixed capital formation and stock changes) (I), government consumption/expenditure (G) and net export (EX-IM). The side of aggregate demand in an economy can be described in a simple macroeconomic model as follows Y = C + I + G + (EX-IM). The increase in consumption, investment, government spending and net exports (EX-IM) will cause an increase in the production of goods and services. The increase in the production of goods and services will cause an increase in GDP. The increase in GDP will lead to increased economic growth. This study is

Corresponding Author: Saidi, La Ode

supported by Budiono (2008) that a country will specialize in producing more efficient goods for which the country has a comparative advantage.

5. CONCLUSIONS

This study aims to examine the effect of consumption spending, investment and export as well as volatility on economic growth in Indonesia. The data used are quartely time series data covering consumption spending, investment, export, and GDP (used as a proxy for economic growth) which span from the period of the first quarter of year 2000 to the fourth quarter of year 2013.

To test this effect, the EGARCH-M model is used. The test results show that the consumption spending, the export, and the volatility affect the economic growth in Indonesia. In addition, it shows that the investment does not affect the economic growth within the period of 2000Q1-2013Q4.

REFERENCES

1. Akbulaev, N., & Muradzada, I. (2023). Econometric analysis of foreign trade and economic growth relationship in Azerbaijan and Italy. Multidisciplinary Science Journal, (2024), 6, e2024002. https://doi.org/10.31893/multiscience.2024002.
2. Alesina, A., S., Ardagna., Nicoletti, G., & Schiantarelli, F. (2005). Regulation and Investment. *Journal of the European Economic Association*, 3(4), 791-825.
3. Ali, N., H., Engka., D., & Tumangkeng, S. (2014). Pengaruh Pengeluaran Konsumsi dan Investasi terhadap Pertumbuhan Ekonomi di Kota Manado. *Jurnal Berkala Ilmiah Efisiensi*, 14(3), 1-24.
4. Arrow, K. J., & Kurz, M. (1970), *Public Investment, the Rate of Return and Optimal Fiscal Policy*. Baltimore, MD: Johns Hopkins University.
5. Amri, A (2008), *Teori Ekonomi Makro*. Jakarta: Salemba Empat, Jakarta.
6. Barro, R. J (1990), "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy*, 98, 103–25.
7. Budiono. (1994). *Ekonomi Makro, Seri Sinopsis Pengantar ilmu Ekonomi* (3 rd Edition). Yogyakarta: Penerbit.BPFE.
8. Engle, R. F., Lilien,, D. M., & Robins, R. P. (1987). Estimating Time Varying Risk Premia in the Term Structure: The ARCH-M Model. *Econometrica*, 55, 391–407.
9. Ernita, D., Alam, S., & Syofyan, E. (2013). Analisis Pertubuhan Ekonomi, Investasi dan Konsumsi Indonesia. *Jurnal Kajian Ekonomi*, 1(2), 176-193.
10. Ghani, E., & Din, M. (2006). The Impact of Publik Invesment on Economic Growth in Pakistan," *The Pakistan Development Review*, 45(1), 87-98.
11. Irawan., & Suparmoko. (2002). *Ekonomi Pembangunan*. Yogyakarta: BPFE.
12. Keynes, J. M. (1936). General Theory of Employment Interest and Money.
13. Khan, M. S., & Reinhart, C. M. (1990). Private Investment and Economic Growth. *World Development*, 18(1), 19-27.
14. Kuncoro, M. (2004). *Ekonomi Pembangunan Teori, Masalah dan Kebijakan* (4 th Edition). Yogyakarta: UUP-AMP.YKPN.
15. M'Amanja, D., & Morrissey, O. (2006). Foreign Aid Invesment and Ekonomic on Economic Growth in Kenya: A Time Series Approach. *Credit Research Paper* No. 6/5, University of Nottingham .
16. Samuelson, P. A., & William, W. D. (1997). *Economics* (16 th Edition). China: MC Graw Hill.
17. Sukirno, S. (2008). *Makro Ekonomi Modern, Perkembangan Pemikiran dari Klassik hingga Keynessien baru*, Jakarta: Penerbit PT. Raja Grafindo Persada
18. Mankiw, N. G. (2007). *Macroeconomics* (6th Edition). New York: Worth Publishers.
19. Murthy, V. N. R., & Okumande, A. A. (2016). Determinants of U.S. Health Expenditure: Evidence from Autoregressive Distributed Lag (ARDL) Approach to Cointegration. *Economic Modelling*, 59, 67–73
20. Tri, R. (2019). BI Optimistis Pertumbuhan Ekonomi 2019 Capai 5,2 Persen. Extracted from https://bisnis.tempo.co/read/1181620/bi-optimistis-pertumbuhan-ekonomi-2019-capai-52-persen
21. Rafiy, M., Adam, P., Bachmid, G., & Saenong, Z. (2018). An Analysis of The Effect of Consumption Spending and Investment on Indonesia' s Economics Growth. *Iranian Economic Review, 22*(3), 753- 766.
22. Nelson., & Daniel, B. (1991). Conditional Heteroskedasticity in Asset Returns: A New Approach. *Econometrica*,59, 347–370.
23. Nuraini, I. (2005). *Pengantar Ekonomi Makro***.** Malang: UMM.Malang.
24. Pratama, R. (2008). *Makro Ekonomi*. Jakarta: Penerbit LPFUI.

Corresponding Author: Saidi, La Ode

25. Sinha. (1999). *Export instability, investment and economic growth in asian countries: A time series analysis*. Center Discussion Paper No. 799, Yale University, Australia. Extracted from https://ageconsearch.umn.edu/record/28466/?ln=en
26. Smith, A. (1977). *An Inquiry Into the Nature and Causes of the Wealth of Nations*. Chicago: University of Chicago Press.
27. Stankove. (2018). Deregulation, Economic Growth and Growth Acceleration. *Journal of Economics Development*, 43(4), 21-39.
28. Tambunan, T. (2001). *Perekonomian Indonesia*. Jakarta: Ghalia Indonesia.

Corresponding Author: Saidi, La Ode