Article Type: Research Paper

The effect of external debt, foreign investment and exports on economic growth in 16 Asian countries

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Abstract: This research aimed at analyzing the effect of economic growth lag, external debt, foreign investment and exports on economic growth in 16 Asian countries. The research used time series data from 2010-2020, and a sectional series in 16 Asian countries. The tool of analysis which was used in this research is Dynamic panel data regression. The result shows that the model of the system generalized method of the moment is the best model, the based on the result of analysis shows that economic growth lag has a positive significant influence, and in the short and long term the external debt has a negative significant influences, exports has positive significant influences on economic growth, while foreign investment does not have a significant influence towards economic growth.

Keywords: Economic Growth; External Debt; Foreign Investment; Export; System Generalized Method of Moment
JEL Classification: C33; F43; O47; O53

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THIS ARTICLE IS AVALILABLE IN:
http://journal.umy.ac.id/index.php/esp

DOI: 10.18196/jesp.v25i1.18407

CITATION:
Syaparuddin, S., Pratama, H. P., Katamso, K., & Zevaya, F. (2024). The effect of external debt, foreign investment and exports on economic growth in 16 Asian countries. *Jurnal Ekonomi & Studi Pembangunan, 15*(1), 205-216.

ARTICLE HISTORY
Received:
21 Apr 2023
Revised:
28 Mar 2024
22 Apr 2024
Accepted:
30 Apr 2024

Introduction

The topic of economic growth has been studied extensively from data which is derived from advanced, developed and underdeveloped countries, as growth is a natural process which indicates evolution. However, reaching stable economic growth is a purpose which is stipulated in a priority agenda of all governments in the world. Finally, economic growth generally could result in a higher per capita income, more job opportunities as the rising competition among economic agents, a directly higher foreign investment, the increase of living standard as well as people's welfare as a whole. However, when the question of sustainability is considered, reaching and maintaining economic growth becomes a challenge. (Higgins, 2015). Then, the problems of economic growth come up as it is dynamic, the former growth would ask the future one.

One of the important sources of financing development and creating economic growth in many countries including in Asia is external debt. External debt has become an important financial source for most developing countries, let alone, as a way to add a source of state income to reach development activities, (Manasseh, 2022). But most external debt has a long-term problem both economically and politically and it could be

a burden as if it were an economic trap, as a large number of external debt would be paid in the future (Suidarma, 2021).

Besides, foreign investment can also drive economic growth. According to the theory of foreign investment, the investment has a positive impact towards economic growth in the long term via technology transition, the increasing quality of human resources, management modernization and organization. Foreign investment shares a better living quality in the aspects of income, education, skills as well as product availability. In the long term, it would create an aggregate demand and supply which will have an impact towards economic growth. (Haris, 2018).

In an open economy, the role of the foreign sector is really important to increase domestic production capacity, as export could extend markets and enable countries to acquire benefits and national income, in turn, it will generate economic growth. When a country could drive the growth of certain sectors which have an export base. So its economic growth would rise faster. As such condition has a bigger multiplier effect on its economy.

This research is aimed at analyzing the effect of economic growth lag, external debt, foreign investment and export towards economic growth in 16 Asian countries. This research would cover 16 Asian countries which represent Southeast Asia; Indonesia, Thailand, Malaysia, Filipina, Kambodja dan Vietnam, 4 East Asia; China, Taiwan, Japan, dan Korea and 2 Central Asia; Kazakstan dan Uzbekistan, 3 South Asia; Afghanistan, India and Pakistan and Azerbaijan represent Nort Asia.

Research Method

Data used in this research is a secondary times series for the period of 2010-2020 and a sectional series in 16 Asian countries, data used are economic growth, external debts, foreign investment, and exports which are derived from Asia Development Bank and World Bank.

To answer the purpose of this research, so dynamic panel data regression analysis is used by estimating two steps using software stata mp 17. Using such a tool as there is still an endogeneity problem when it is estimated directly, would result in a biased and inconsistent estimator (Juanda & Junaidi, 2012). Therefore in this research, dynamic panel data is used as using estimation lag-dependent variable, a produced estimation is not biased and consistent.

There are two approaches in dynamic panel data; *First Different GMM* and *System GMM,* Blundel and Bond (Baltagi,2005) state that when the sample is small, an estimator of *First Different GMM* (FD GMM) could be biased and inaccurate. Blundel and Bond suggest that using the *System Generalized Method of Moment* (*SYS* GMM) model is more efficient when using short *time series data*. In this research, the best model is used, a general model of *First Different GMM* dan model *System* GMM as follows (Baltagi 2005):

$$Y_{it} = \delta Y_{it-1} + \beta_1 X_{it} + e_{it} \quad \text{.....} \quad (1)$$

The model of estimation equation FD GMM and SYS GMM be altered to be as follows:

1. Equation Estimation Model in two steps in short terms :

$$PE_{it} = \beta_0 + \beta_1 PE_{it-1} + \beta_2 LNDEBT_{2it} + \beta_3 LNFDI_{3it} + \beta_4 LNEXP_{4it} + e_{it} \quad (2)$$

2. Equation Estimation Model in two steps in the long term:

$$PE_{it} = \beta_1 LNDEBT_{1it} + \beta_2 LFDI_{2it} + \beta_3 LNEXP_{3it} + e_{it} \quad \text{.....} \quad (3)$$

Notes :
PE : Economic growth
PE_{-1} : Lag of Economic Growth
LNDEBT: Logaritma of natural external debt
LNFDI : Logaritma of natural foreign investment
LNEXP : Logaritma of natural exspor
β_0 : Konstantin
β_1, β_2, β_3: Coeficient of regression
i : person (1,2,3…n)
t: times (1,2,3…n)
ei: *Error term*

Spesification Model Test

The Selection of Best Model

This step is needed to know the best model between the two models in the dynamic panel data model to be used. This can be seen from the model whether its estimator is biased or inaccurate, if a model is biased another model is the best and most accurate to use.

In order to see the unbias estimator, it could be seen from the value of a dependent lag coefficient variable at model FD GMM or SYS GMM, by comparing the value of the value of the coefficient of *lag* dependent variable lag at model SYS GMM, unbias model is when the value of *lag* dependent variable lag at model FD GMM or SYS GMM stays between *lag* variable FEM model and PLS model.

Sargan Test

Sargan test is conducted to have a look and make sure that the instrument variable is valid in which the numbers are bigger than the estimated parameter (overidentifying). The testing is by comparing the value probability of chi-square or p-value with alpha = 5%, if p-value > alpha, it is concluded that the instrument variable is valid and if p-value < alpha so instrument variable is not valid.

Arellano-bond Test

The Arellano-Bond test is conducted to see whether estimation results are consistent or inconsistent, by doing so, the correlation between residual components towards another residual component can be seen in the GMM model System. This test is done by comparing probability value or p-value second ordo with alpha =5%, if p-value > alpha there is no autocorrelation and if p-value < alpha so there is autocorrelation which indicates the estimation is inconsistent.

Z test

Z test is aimed at seeing the effect of the independent variable individually towards the dependent variable. The test is done by comparing prob z with the alpha used (in this research alpha 0.05). if prob z < alpha, so independent variable has a significant effect on the dependent variable, and on the other hand. (Gujarati, 2012).

Wald Test

Wald test is done to see whether there is an effect of the independent variable simultaneously towards the dependent variable. If the value of prob chi-square or p-value < alpha, so independent variable simultaneously has a significant effect towards the dependent variable and vice versa.

Result and Discussion

Descriptive Statistic

Based on the macroeconomic aspect, the rate of economic growth during 2011-2020 in 16 Asian countries was 4,11% on average, with the highest one being 10,9% in Afghanistan in 2012, while the lowest was -9,5% in Filipina in 2020.

Table 1 Descriptive Statistic

Variable	Maximum	Minimum	Mean	Median
Economic growth	10.9	-9.5	4.11	4.95
External debt	4778.87	2.43	441.27	7.25
Foreign investment	290.92	12.97*	23.78	142.07
Exports	2590.64	305.79*	314.78	168.31

*million USD

For the position of Foreign loans, the biggest one was in Japan in 2020, it was 4778.87 billion USD, while the lowest one belonged to Afghanistan in 2010 with 2.43 billion USD, the average number of external debt in those 16 Asian countries was 441,27 billion USD. The highest foreign investment during 2010-2020 belonged to China with 290.92 billion USD in 2013, while the lowest foreign investment in 2020 with 12.97 billion USD belonged to Afghanistan, the average foreign investment was 23.78 billion USD. The high number

of foreign investments (mainly direct foreign investment) in China among those other 16 countries was caused by the strong positive attraction power and China had high economic growth during 2010-2020 with 7.18% on average, even during the early Pandemic Covid-19 2020, China's economy grew at 2.3% (ADB, 2021). This condition is different with Japan, South Korea, Indonesia, India and Thailand which had negative economic growth. High number of population with quick adaptation ability and high working spirit have become the main driving and leverage power for China's economy to be more developed.

Then, the highest exports belonged to China in 2020 with 2590.64 billion USD, the lowest one belonged to Afghanistan in 2012 with 305.79 million USD, and the average of exports was 314.78 billion USD. Such a large number of China's exports was caused by the openness of its economic system and the high demand for its products as they provide the products with low prices and China's understanding of the needs of other nations. It means that China has good market research. The prices of China's products are cheaper and variation has driven the demand for their products higher. Investment expansion has also driven China's exports to become bigger.

Specification model test

This research would search for the best model between the two dynamic panel data models. In order to know, it could be seen from its estimator model whether having bias or is inaccurate, if a model has a bias, another model would be the best and most accurate to use. The result of the estimation model of FEM, FD GMM, SYS GMM, and PLS can be seen in Table 2.

Table 2 Estimation model FEM, FD GMM, SYS GMM, dan PLS

Variable	FEM	FD GMM	SYS GMM	PLS
C	54.139249	52.766339	14.866376	2.7003296
PE_{t-1}	0.24601218	0.12504509	0.43490177	0.61262045
LNDEBT	-5.2049875	-6.5876903	-40.641912	-0.43348081
LNFDI	0.52640911	0.32906475	0.26475088	0.36197778
LNEXP	0.40641026	2.18777448	3.1312062	0.14813575

Based on Table 2, the value of the coefficient lag variable dependent model FEM is 0.24601218, while the value of the lag variable dependent model FD GMM was 0.12504509, lag variable dependent model SYS GMM is 0.43490177, and the value of coefficient lag variable dependent model PLS is 0.61262045. it means that the value of lag variable dependent model FD GMM is under the value of lag variable dependent model FEM which indicates that estimation derided from model FD GMM is biased and inaccurate.

Then the value of the coefficient lag variable dependent is 0.43490177, This indicates the coefficient lag variable dependent model SYS GMM is lying between the value of coefficient lag variable dependent model FEM and PLS, which means that the result of the estimation of model SYS GMM is accurate and no bias. Therefore the best model to be used in this research is the SYS GMM model (System Generalized Method of Moment).

Sargan test

In order to make sure the instrument variable to be used is valid, the test is applied. The result is shown in Table 3.

Table 3 Sargan test

Chi-Square	Prob.
13.74336	1,0000

Based on the Sargan test, prob Chi-square is 1,000 bigger than alpha 0.05, so is concluded that the instrument variable has no correlation with error, which means the instrument variable is valid.

Arellano-bond test

In using a dynamic panel regression must be consistent, in order to know it, the Arrelano-bond test must be done. The result is in Table 4.

Table 4 Arellano-bond test

Order	z-Statistic	Prob.
1	-1.8901	0.0587
2	1,1063	0.2686

Referring to Table 4, the value of prob z in order 2 is 0.2686, it can be seen that prob z is bigger than alpha (5%), which means that there is no autocorrelation at *error first difference* di ordo -2, so it means that the estimation is consistent.

Result of Model Estimation SYS GMM in Short-Term

Based on the processed data, the effect estimation of lag economic growth, external debt, foreign investment and exports toward economic growth in the short term can be seen in Table 5.

Table 5 Short-term SYS GMM model estimation

Variable	Coefficient	Std.Error	z-Statistic	Prob.
C	14.86638	7.60263	1.96	0.051
PE_{t-1}	0.4151542	0.1702968	2.44	0.015
LNDEBT	-4.349018	0.8243694	-5.28	0.005
LNFDI	0.2647509	0.2764704	0.96	0.338
LNEXP	3.131206	0.4771675	6.56	0,000

Z test

Z test is done in order to know the effect of the independent variable individually towards the dependent variable. Based on Table 5, the variable of lag economic growth was 0.4151542, prob z statistic is 0.015 < 0.05(alpha), which means that economic growth during the former period had a positive and significant effect towards economic

growth individually in 16 Asian countries. The value of the coefficient variable of external debt is -4.349018, prob z statistic is 0.000 < 0.05, so it is concluded that in the short term external debt individually has a negative and significant effect on economic growth in 16 Asian countries. While the foreign investment variable with 0.2647509, prob z statistic with 0.338 > 0.05, so it is concluded that in the short term, foreign investment has no significant effect on economic growth in 16 Asian countries. Export Variabel with regression coefficient 2.75848, prob z statistic with 0.048 < 0.05, means that in the short term export individually has a positive and significant effect on economic growth in 16 Asian countries.

Wald test

This test is used in order to know the effect of the overall independent variable on the dependent variable. The result is shown in Table 6.

Table 6 Wald test

Chi-Square	Prob.
318.34	0.0000

Based on Table 6, the value of pro-chi-square is 0.000 < alpha (0.05), which means that the earlier economic growth, external debt, foreign investment and export simultaneously have significant effects on economic growth.

Result of Model Estimation SYS GMM in Long-Term

Based on processed data, the estimation of the effect of external debt, foreign investment and export on economic growth in the long term, is shown in Table 7.

Tabel 7 Long-term SYS GMM model estimation

Variable	Coefficient	Std.Error	z-Statistic	Prob.
LNDEBT	-7.436179	1.147957	-6.48	0.000
LNFDI	0.4526849	0.5374551	0.84	0.400
LNEXP	5.353901	1.270854	4.21	0.000

Z test

Z test is to know the effect of the independent variable individually on the dependent variable. Based on Table 7 coefficient of external debt is -7.436179, prob z with 0,000 < 0,05, which means that in the long external debt has a negative and significant effect on economic growth. For the variable of foreign investment, with 0.4526849, prob z with 0.400 > 0.05, means that in the long term foreign investment individually does not have a significant effect on economic growth. While the export variable with coefficient 5.353901, prob z with 0.000 < 0.05, means that in the long term export individually has a positive and significant effect on economic growth.

Discussion

The effect of lag economic growth on economic growth

Based on processed data of earlier economic growth economic growth had a positive and significant effect on economic growth in 16 Asian countries. This is in line with Keynes's theory that if economic growth occurred at the time of aggregate demand bigger than its supplies "the lack of production" would happen, and in turn there would be an increase in price for the next output or even that would happen simultaneously (Mankiw, 2007). The increase in output would increase economic growth in the long term.

Economic growth happens as the increase of production, the increase in production would absorb more jobs so in turn the income would also rise and stimulate society's purchasing power and finally it would increase production and economic growth in the long term (Prawoto, 2019).

The result of research done by Kalan and Gokasar (2020) showed that *lag* economic growth had a positive and significant effect on economic growth in Turkey. But it is different from other research in East Africa as proven by Mekannon (2017) which showed that lag economic growth had no significant effect on economic growth in East Africa.

The effect of external debt on economic growth

Based on processed data external debt has a negative and significant effect on economic growth in both the short and long term, which means that external debt has slowed economic growth in the area of research. This condition is in line with the theory of loans based on the classical view that external debt is a burden and tends to endanger capital accumulation, their present and future consumption would equalize debt and tax in the future and has negative connotations in a country(Yapo, 2002). In the future it would be a burden to pay and pay off the debts beside that would decrease the proportion of a state's expenditures.

This result is in line with research done by Masaseh (2022) which showed that external debt had a negative and significant impact on economic growth in Africa Sub-Sahara. Then the same research was done by Hassan (2016) which also showed that in long term external debt in long term had a negative and significant impact on economic growth. but this is different from research in another country Nigeria, done by Sulaiman & Azeez (2012) which showed that external debt has a positive and not significant impact on economic growth.

The Effect of foreign investment on economic growth

Based on processed data foreign investment has a positive but not significant on economic growth both in the short and long term. This describes that foreign investment in 16 Asian countries has no impact on economic growth. As foreign investment would bring original products from their countries, this condition has caused the original

domestic product in the country to have no more market, this condition worsened for domestic industries (2021), therefore foreign investment has no significant impact on the output of the country and economic growth.

This research is in line with Zhang's research (2020) which showed that foreign investment has an impact but does not significant on economic growth, the same result also in Nigeria, which was done by Udeaja and Onyebuchi (2015) which showed that foreign investment had no significant impact on economic growth. But it is different from research in the western Balkans, which was done by Fetai (2017) which showed that foreign investment had a positive and significant effect on economic growth in West Balkan countries.

The effect of export on economic growth

Based on processed data export has a positive and significant effect on economic growth both in the short and long term. The theory of *endogenous economic growth* which is applied by Romer and Lucas describes that international trade in terms of export activities has a positive impact on output and economic growth. The theory of endogen economics formulated that the decreasing of barriers in international trade would accelerate economic growth in the future. Salvatore (2014) confirmed that export is one of the important factors in increasing output and driving economic growth in developing countries.

The result of this research implies that Asian countries continue to move toward globalisation and international trade. By exporting, it could strengthen their economic sectors which have comparative advantages, specialization as well as manpower productivity. Export has assisted many countries to take advantage of their economic scales.

Then export would drive and increase capital investment both from domestic and foreign countries. This happens as there is a market extension as the effect of the export sector. In the long term, export progress would have the way of innovation and technology, industries would be supported to import new kinds of technology from abroad in facing foreign competition. By doing so, the product would be more produced to fulfil the demand of international trade.

The result of this research suites with research done by Tiwari (2011) which was done in 23 Asian countries and showed that exports had positive and significant impacts on economic growth in those 23 Asian countries. The same result of research done by Batrancea (2021) in 34 African countries where exports had positive and significant impacts on economic growth in those 34 African countries. However, this research is different from those in Central and East European countries which was done by Ioan (2020).

Conclusion

This research explicates the influence of economic growth, foreign debt, foreign investment, and exports on economic growth in 16 Asian countries. Therefore, this study aims to analyze the effects of lagged economic growth, foreign debt, foreign investment, and exports on economic growth in these 16 Asian countries during the period from 2010 to 2020. The research utilizes time series data from 2010 to 2020 and sectional series across the 16 Asian countries. The Generalized Method of Moments (GMM) system model is employed as the optimal model for panel data regression in this study.

Based on the result of the analysis, lag economic growth has positive and significant effects on economic growth. Then in both the short and long term, External debt is negative and significant, exports are positive while foreign investment has no significant effects on economic growth in 16 Asian countries.

Policy implications can be formulated in several ways. First, governments in those 16 Asian countries must be able to ensure the stability of political and economic conditions in order to enjoy the benefits of external debt and minimize the burden of their loans. Second, Governments must develop their commodities which so far do not have comparative and competitive advantages in order to have competitive power and be able to come and compete in international markets, then the governments should also diversify their basic export products.

Author Contributions

Conceptualisation, S. and H.P.P.; Methodology, S. and H.P.P; and Writing S., H.P.P.,and K.; Data and Literature, S. and K.; Review, S., H.P.P.; Editing, K. and F.Z; and Visualization, F.Z

Conflicts Of Interest

The corresponding authors declare no conflicts of interest. The funder had no role in the design, in the data collection, analysis, or interpretation; in the writing of the manuscript in writing the manuscript, or in the decision to publish the results.

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