



## *The Effect of Foreign Direct Investment on the GDP of the Agricultural Sector (Agriculture) in ASEAN Developing Countries*

**Dona Fitria**

Student of Doctoral Program in Economics, Borobudur University, Jakarta  
[fitriaqintha@gmail.com](mailto:fitriaqintha@gmail.com)

**Pudji Astuty**

Lecturer at Borobudur University, Jakarta  
[Pudji\\_astuty@borobudur.ac.id](mailto:Pudji_astuty@borobudur.ac.id)

**Darwati Susilastuti**

Lecturer at Borobudur University, Jakarta  
[darwati\\_susilastuti@borobudur.ac.id](mailto:darwati_susilastuti@borobudur.ac.id)

---

### Abstract

*Foreign Direct Investment* is a long-term foreign capital flow that is relatively less vulnerable to economic turmoil. Foreign direct investment encourages economic development, especially for developing countries that do not have enough funds to meet domestic investment needs. Almost all ASEAN member states are the world's foreign direct investment destination countries. The amount of foreign direct investment received is volatile and tends to increase, otherwise there is a world economic crisis. The amount of FDI also affects the GDP of each country both as a whole and sectorally. One of the sectors that is influenced is the *agricultural* sector (agriculture). For several developing countries in ASEAN, the agricultural sector is one of the sectors that is considered for its development, especially with the existence of FDI. This study aims to examine and test the effect of FDI on the GDP of the agricultural sector in ASEAN developing countries using panel data analysis techniques with the help of eViews software. This study is a causal associative study that uses data samples from 6 ASEAN developing countries, namely Indonesia, Malaysia, Vietnam, Thailand, Cambodia and the Philippines over the past 14 years. The results showed that FDI had a positive and significant influence on the GDP of the Agricultural sector with a coefficient of determination of 77.75%. Thus, it is concluded that FDI determines the amount of GDP of the Agricultural sector in ASEAN developing countries.

**Keywords:** foreign direct investment, gross domestic product, agriculture, sectoral gdp, data panel

---

### INTRODUCTION

Foreign Direct Investment is a long-term flow of foreign capital and is relatively not vulnerable to economic turmoil. Foreign direct investment encourages economic development, especially for developing countries that do not have sufficient funds to meet domestic investment needs. Almost all ASEAN member countries are foreign direct investment destinations in the world. The amount of foreign direct investment received fluctuates and tends to increase, if the world economic crisis does not occur. The amount of FDI also affects the GDP (Mitra, 2015) of each country both as a whole (Edwards, Naanwaab, & Romero, 2017) and sectorally (Khan & Khan, 2011). One of the sectors affected is the agricultural sector (Epaphra & Mwakalasya, 2017). For several developing countries in ASEAN, the agricultural sector is one of the sectors that is considered for development, especially with the presence of FDI.

Foreign Direct Investment (Foreign Direct Investment) or FDI is a foreign direct investment activity that can be realized when a resident company's direct investor finds lasting interest through a direct investment company located in another economy (Qi, 2011). In other words, defining foreign direct investment (Foreign direct investment) or can be called foreign investment is an international capital flow where companies from one country establish or expand their companies in other countries. There are several forms of FDI that can be carried out depending on the direction of investment, the investment instrument used and sector breakdown (Duce & España, 2003).

Several theories explain the existence of FDI in a country (Jones & Wren, 2016), namely: 1). The theory of international operations of national companies was put forward by Hymer in 1960, 2). Product life-cycle theory proposed by Vernon in 1966, 3). Horizontal and vertical theories (Horizontal and vertical theories) proposed by Caves in 1971, 4). Internalization theory proposed by Buckley and Casson in 1976, 5). Theory of Strategic Behavior of Firms (Strategic behavior of firms theory) put forward by many experts, one of which is Graham in 1976 and 6). The Eclectic Paradigm theory was proposed by Dunning in 1988.

The entry of FDI into a country can have many effects or impacts both economically and non-economically. From the non-economic side, the influx of FDI also affects. From the economic side, FDI has a positive and significant impact on GDP and economic growth both overall and sectorally. One sector of concern is the agricultural sector.

National Geographic (2011) defines agriculture as the art and science of tilling the land, growing crops and raising livestock. This includes the preparation of plant and animal products for public use and their distribution to the market. Harris & Fuller (2014) define agriculture as growing crops and domesticated animals that sustain the global human population by providing food and other products such as cultivation, domestication, horticulture, arboriculture, and vegeculture, as well as forms of livestock management. In some Asian countries, agricultural products such as soybeans, rice, peanuts, sweet potatoes, cassava, corn, are gifts from natural resources that have existed since ancient times. In addition, trading agricultural crops such as tea, oil palm, coffee and rubber also support the agricultural sector to grow and become a leading export commodity.

The World Bank (2021) explains that the GDP of the agricultural sector is added value (% of GDP) from the agricultural sector according to the International Standard Industrial Classification (ISIC) division in ISIC 1-3 divisions and includes forestry, hunting and fisheries, as well as crop cultivation and livestock production. The value added of the agricultural sector is the net output of the agricultural sector after adding up all the outputs and subtracting the inputs related to agricultural processes such as the reduction in the value of the assets used.

## METHOD

The research method used in this study is a quantitative research method. Judging from the level of explanation, this study is a causal associative study that examines and tests hypotheses related to the effect of FDI on the GDP of the agricultural sector. The object of this study is 6 ASEAN developing countries, namely Indonesia, Malaysia, Vietnam, Thailand, Cambodia and the Philippines. The period studied is 14 years, namely 2006 to 2019. So that the amount of data used in this study is 84 data, both FDI and GDP of the agricultural sector. Data obtained through secondary sources or data published by the ASEAN Secretariat, the World Bank, UNTAD and the World Economic Forum. The data analysis technique used in this study is panel data regression analysis. The Panel data regression analysis technique used in this study is an approach with *the Ordinary Least Square* (OLS) technique. For the data analysis process, researchers use eViews software.

## RESULTS AND DISCUSSION

To be able to obtain the desired result, the researcher performs several steps. First conduct a stationary test of the model as shown in table 1, then to choose the best model this study uses *the common effect model* (results can be seen in table 2), *the fixed effect model* (table 3) and *the random effect model* (table 4).

**Table 1. Model Stationary Test Results**

Variabel	Tingkat Level
----------	---------------

LITERATUS is a journal published by Neoelectura, issued two times in one year.

Literatus is a scientific publication media in the form of conceptual paper and field research related to social impact and cultural studies.

It is hoped that LITERATUS can become a media for academics and researchers to publish their scientific work and become a reference source for the development of science and knowledge.

**Our focus:**  
Social and Culture

**Our Scope:**  
Humanities, Education, Management, History, Economics, Linguistics, Literature, Religion, Politics, Sociology, Anthropology, and others.



	PP Fisher	Keterangan
GDP Sektor Pertanian	0.0001	Stasioner
Investasi Asing Langsung	0.0001	Stasioner

**Table 2. Common Effect Model**

Dependent Variable: AGR  
Method: Panel Least Squares  
Date: 08/19/21 Time: 04:30  
Sample: 2006 2019  
Periods included: 14  
Cross-sections included: 6  
Total panel (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	71.27768	16.77414	4.249259	0.0001
lnFDI	-2.493471	0.745136	-3.346331	0.0012
R-squared	0.120152	Mean dependent var		15.20048
Adjusted R-squared	0.109422	S.D. dependent var		7.185659
S.E. of regression	6.781137	Akaike info criterion		6.689688
Sum squared resid	3770.673	Schwarz criterion		6.747565
Log likelihood	-278.9669	Hannan-Quinn criter.		6.712954
F-statistic	11.19793	Durbin-Watson stat		0.545063
Prob(F-statistic)	0.001238			

Source : eViews output (2021)

**Table 3. Fixed Effect Model**

Dependent Variable: AGR  
Method: Panel Least Squares  
Date: 08/19/21 Time: 04:30  
Sample: 2006 2019  
Periods included: 14  
Cross-sections included: 6  
Total panel (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.73181	11.60850	-1.182910	0.2405
lnFDI	1.286473	0.515910	2.493601	0.0148

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.793611	Mean dependent var	15.20048
Adjusted R-squared	0.777529	S.D. dependent var	7.185659
S.E. of regression	3.389246	Akaike info criterion	5.358747
Sum squared resid	884.4980	Schwarz criterion	5.561315
Log likelihood	-218.0674	Hannan-Quinn criter.	5.440178
F-statistic	49.34713	Durbin-Watson stat	1.052502
Prob(F-statistic)	0.000000		

Source : eViews output (2021)

**Table 4. Random Effect Model**

Dependent Variable: AGR  
Method: Panel EGLS (Cross-section random effects)  
Date: 08/19/21 Time: 04:31  
Sample: 2006 2019

Periods included: 14  
 Cross-sections included: 6  
 Total panel (balanced) observations: 84  
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.163469	11.65820	-0.786010	0.4341
lnFDI	1.083342	0.509228	2.127421	0.0364

Effects Specification		S.D.	Rho
Cross-section random		5.265463	0.7071
Idiosyncratic random		3.389246	0.2929

Weighted Statistics			
R-squared	0.049437	Mean dependent var	2.577073
Adjusted R-squared	0.037844	S.D. dependent var	3.559530
S.E. of regression	3.491526	Sum squared resid	999.6417
F-statistic	4.264640	Durbin-Watson stat	0.943923
Prob(F-statistic)	0.042073		

Unweighted Statistics			
R-squared	-0.127086	Mean dependent var	15.20048
Sum squared resid	4830.236	Durbin-Watson stat	0.195350

Source : eViews output (2021)

Furthermore, to choose the best model estimate between the common effect and the fixed effect, the researcher used the redundant test (chow test). The results of the redundant test (chow test) can be seen in table 5. From the results of the redundant test in table 5, it can be seen that the probability value of cross section  $F < 0.05$ , ( $0.000 < 0.05$ ), so  $H_0$  was rejected and  $H_a$  was accepted which means that the best model based on the redundant test is a fixed effect model. The fixed effect model is better used in estimating panel data when compared to the common effect model. Then after that choose the best model between fixed effect and random effect model using hausman test. The results of the hausman test can be seen in table 6.

**Table 5. Redaundant Test Results (Chow Test)**

Redundant Fixed Effects Tests  
 Equation: Untitled  
 Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	50.251212	(5,77)	0.0000
Cross-section Chi-square	121.799038	5	0.0000

Source : eViews output (2021)

**Table 6. Hausman Test Results**

Correlated Random Effects - Hausman Test  
 Equation: Untitled  
 Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.023841	1	0.0141

Sumber : output eViews (2021)

From the results of the hausman test above, it can be seen that the probability value of the cross section chi square  $> 0.05$ , ( $0.0141 < 0.05$ ), so that  $H_0$  was rejected and  $H_a$  was accepted which means that the best model based on the hausman test is the Fixed Effect model. The fixed effect model is better used in estimating panel data when compared to the Random Effect. Because based on the redundant test and the hausman test, it is

LITERATUS is a journal published by Neolectura, issued two times in one year. Literatus is a scientific publication media in the form of conceptual paper and field research related to social impact and cultural studies. It is hoped that LITERATUS can become a media for academics and researchers to publish their scientific work and become a reference source for the development of science and knowledge.

**Our focus:**  
 Social and Culture

**Our Scope:**  
 Humanities, Education, Management, History, Economics, Linguistics, Literature, Religion, Politics, Sociology, Anthropology, and others.



concluded that the fixed effect model is the best model in estimating this model, there is no need to proceed to the langanre test used to test the best model between the common effect and the Random Effect. Based on the stages above, the best model for the model of the variables studied is the fixed effect model shown in table 3.

Furthermore, from the output results in table 3, it is described the interpretation of the regression of panel data with a fixed effect model and using the recursive method ( $\hat{Y}_1 = Y_1 + \text{Residual model 1}$ ). This model is to estimate the impact of foreign direct investment on the GDP of the Agricultural Sector in ASEAN developing countries, namely:

$$Z_2 = \beta_0 + \text{Ln} \hat{Y} \beta + \varepsilon_t$$

$Z_2$  = GDP of the Agricultural Sector

$\beta_0$  = Model Constants

$\hat{Y}$  = Foreign Direct Investment (FDI)

$\beta$  = Free variable Regression Coefficient

$\varepsilon_t$  = Epsillon (Other factors outside the model)

So that from Table 3, the following form of the equation is obtained:

$$\text{Gdp of the Agricultural Sector} = - 13.73181 + 1.286473 \text{ Ln} \hat{Y}$$

From the form of the regression equation above, it can be interpreted as follows:

- Constant Value = - 13.73181 means that statistically if all variables of ceteris paribus have a constant value, then the GDP value of the Agricultural Sector is minus - 13.73181 units.
- The Value of Regression Coefisen  $\beta_7 = 1.286473$ , meaning that the value of elasticity of foreign direct investment to gdp of the agricultural sector is  $E = 1.286473$ . The value of  $E > 1$  indicates that the increase in foreign direct investment is **elastic** to the GDP of the Agricultural Sector.

After getting the equation of the FDI influence model on the GDP of the Agricultural sector then to prove the hypothesis proposed, the researcher conducted a hypothesis test. Based on Table 3, a statistical t value of foreign direct investment of 2.493601 with a probability value (p-value) of 0.0148 was obtained. The statistical value of foreign direct investment of 2.493601 and a positive value indicates that foreign direct investment has a positive effect on the GDP of the Agricultural Sector. The probability value (p-value) of 0.0148 is less than the significance value of 0.05, so it can be concluded that  $H_0$  is rejected, and  $H_a$  is accepted, which means that foreign direct investment has a positive and significant effect on the GDP of the Agricultural Sector in ASEAN countries.

The magnitude of the influence of foreign direct investment on the GDP of the Agricultural Sector is indicated by the R-Squared Adjuted value of 0.777529, which means that foreign direct investment affects the GDP of the Agricultural Sector by 77.7529% and the remaining 22.25% is influenced by other factors outside the model studied

### Discussion

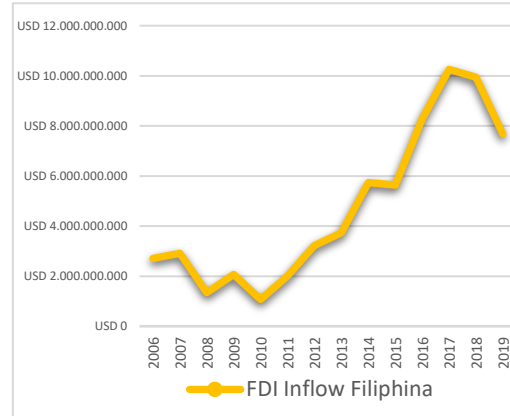
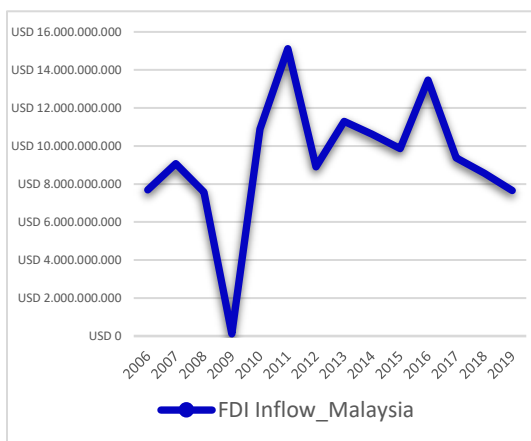
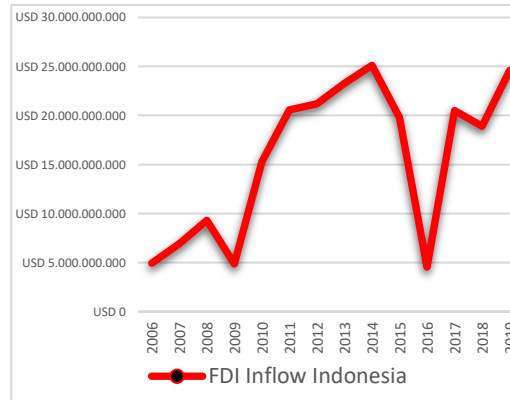
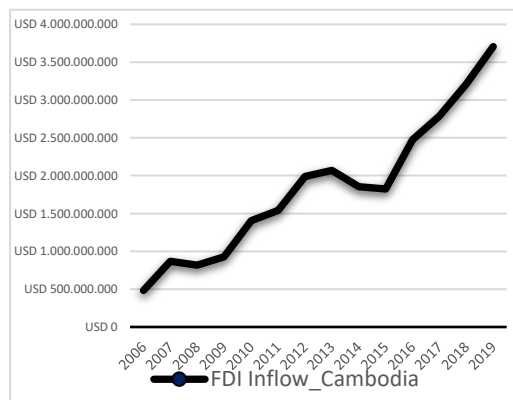
Foreign direct investment (FDI) is a form of investment made by companies from a country to invest in a long-term investment in companies in other countries. The value of foreign direct investment used is the total value of foreign direct investment (FDI inflow) received by each country in US Dollars.

FDI in ASEAN developing countries during the 14-year research period (2006 – 2019) with 84 research samples had an average value of US\$ 8,377,624,119-. The highest FDI value of US\$ 25,120,732,060 is the FDI value received by Indonesia in 2014. While the lowest FDI value of US\$ 114,664,434.6 is the FDI value received by Malaysia in 2009. During the research period, there was a movement of new forces from several countries that had the potential to continue to attract FDI both from within and from outside Asean. These countries are the Philippines and Vietnam. The value of foreign direct investment from the two countries has consistently increased almost every year.

In figure 1, a graph of the FDI trend of each ASEAN developing country is displayed during the research period. Cambodia's FDI during the period 2006 – 2019 had

an average value of US\$ 1,853,770,308--. During the period, the highest FDI value was obtained in 2019 with a value of US\$ 3,706,032,999, while the lowest FDI value was obtained in 2006 with a value of US\$ 815,180,218. Meanwhile, Indonesia has an average FDI value during the period 2006 - 2019 of US \$ 15,701,518,109-. During the period, the highest FDI value was obtained in 2014 with a value of US\$ 25,120,732,060. While the lowest FDI value was obtained in 2016 with a value of US\$ 4,541,713,739. For Malaysia, the average FDI value during the period 2006 – 2019 was US\$ 9,298,735,369-. During the period, the highest FDI value was obtained in 2011 with a value of US\$ 15,119,439,204. While the lowest FDI value was obtained in 2009 with a value of US\$ 114,664,435. Furthermore, the Philippines FDI showed an average value during the period 2006 – 2019 of US\$ 4,757,840,818-. During the period, the highest FDI value was obtained in 2017 with a value of US\$ 10,256,442,399. While the lowest FDI value was obtained in 2010 with a value of US\$ 1,070,386,940.-

Meanwhile, the average FDI value of Thailand during the period 2006 - 2019 was US \$ 8,775,522,968-. During the period, the highest FDI value was obtained in 2013 with a value of US\$ 15,935,960,665. While the lowest FDI value was obtained in 2011 with a value of US\$ 2,473,685,996.-. Furthermore, for Vietnam, the average FDI value during the period 2006 – 2019 was US\$ 9,878,357,143.-. During the period, the highest FDI value was obtained in 2019 with a value of US\$ 16,120,000.-. While the lowest FDI value was obtained in 2006 with a value of US\$ 6,700,000.-

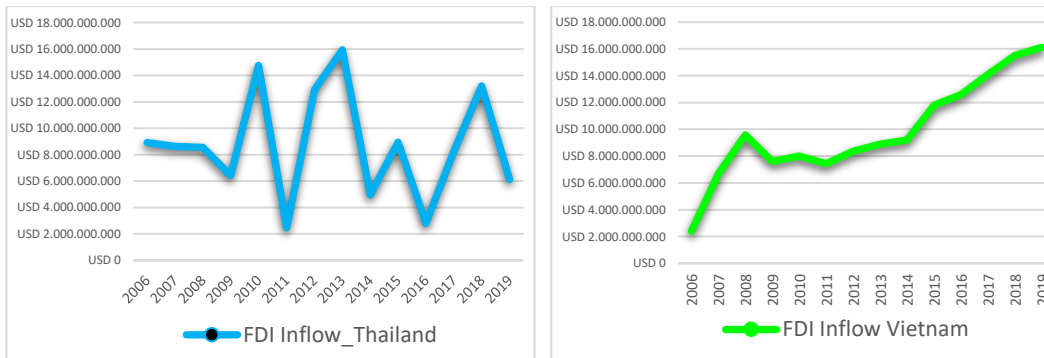


LITERATUS is a journal published by Neolectura, issued two times in one year. Literatus is a scientific publication media in the form of conceptual paper and field research related to social impact and cultural studies. It is hoped that LITERATUS can become a media for academics and researchers to publish their scientific work and become a reference source for the development of science and knowledge.

**Our focus:**  
Social and Culture

**Our Scope:**  
Humanities, Education, Management, History, Economics, Linguistics, Literature, Religion, Politics, Sociology, Anthropology, and others.

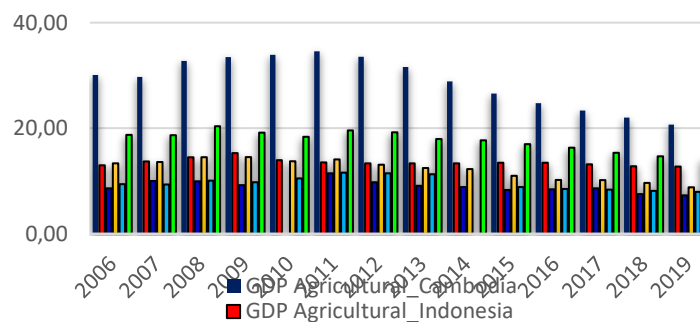




Sumber: World Bank (2021)

**Figure 2.** GDP of Agricultural Sector of ASEAN developing countries (Cambodia,

Indonesia, Malaysia, Philippines, Thailand and Vietnam) during the period 2006-2019 Furthermore, figure 2 shows the changes in the GDP trend of the agricultural sector from each ASEAN developing country studied during the period 2006-2019. As explained earlier that GDP The agricultural sector is a value added (% of GDP) of agriculture according to the ISIC division 1-5 and includes forestry, hunting, and fisheries, as well as crop cultivation and livestock production. A plus is the net output of a sector after summing all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of artificial assets or depletion and degradation of natural resources. The origin of added value is determined by the International Standard Industry Classification (ISIC), In this study the GDP value of the agricultural sector used is the total added value generated from the agricultural sector of ASEAN developing countries (Cambodia, Indonesia, Malaysia, the Philippines, Thailand and Vietnam) during the research period (2006 – 2019). From 84 research samples, the average gdp value of the agricultural sector was obtained at 15.37% of the total GDP value. The GDP value generated by the agricultural sector is the lowest added value among the added value of the industrial sector and the service sector. The gdp of the highest agricultural sector was 34.56% which is the GDP value of the agricultural sector produced by Cambodia in 2011 and the lowest agricultural sector GDP value of 7.26% which is the GDP value of the Malaysian agricultural sector in 2019.



Source: World Bank (2021)

**Figure 2.** GDP of Agricultural Sector of ASEAN developing countries (Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam) during the period 2006-2019

Vietnam is one of the countries in Southeast Asia that is able to take advantage of the foreign direct investment received to change its agricultural system for the better. Vietnam's agricultural sector is better developed by utilizing technology so that it is not only to meet the local market but also to meet export needs. Currently Vietnam is implementing a smart farming system 4.0 that utilizes technology in helping farmers. The support of the availability of data related to the selection of crops, water needs, fertilizers and pesticides for a crop to market access is very helpful for farmers, especially with the support of GPS technology and humidity sensors which are innovative solutions for

Vietnamese farmers towards modern agriculture. The Vietnamese government realizes that increasing the use of technology through agriculture 4.0 is a must to create food security, improve crop quality and produce sustainable agriculture.

This fact shows that foreign direct investment has a positive and significant effect on the GDP of the agricultural sector in ASEAN developing countries. A positive definition means that any increase in foreign direct investment will be followed by an increase in the GDP of the agricultural sector. Foreign direct investment (FDI) has an important role for the GDP of the agricultural sector of ASEAN developing countries. From the results of the study, the fixed effect model was obtained, which is the best model in panel data processing. Without the flow of FDI to a country, or the flow of FDI is constant or fixed, the GDP of the Agricultural Sector will be minus. The results of this study are also strengthened by previous research conducted by Epaphra & Mwakalasya (2017) and Djokoto, Srofenyoh, & Gidiglo (2014).

## CONCLUSION

Based on the results of the researchers, it can be concluded that foreign income directly affects the GDP of the Agricultural Sector in ASEAN developing countries. Without foreign direct investment invested in MNC, the GDP of the Agricultural Sector will experience a minus value. The magnitude of the influence of foreign direct investment on the GDP of the Agricultural Sector is 77.75%. As for the advice that can be given should be to increase the flow of extra-ASEAN foreign direct investment, the ASEAN Economic Community must be more committed to being one of the competitive and investment-friendly integrated regions

## BIBLIOGRAPHY

- Djokoto, J., Srofenyoh, F., & Gidiglo, K. (2014). Domestic and foreign direct investment in Ghanaian agriculture. *Agricultural Finance Review*, 74. <https://doi.org/10.1108/AFR-09-2013-0035>
- Duce, M., & España, B. de. (2003). Definitions of Foreign Direct Investment (FDI): a methodological note. *Banco de Espana*, 6(2), 43–49.
- Edwards, J. A., Naanwaab, C. B., & Romero, A. A. (2017). Effect of FDI on real per capita GDP Growth. A Rolling Window Panel Analysis of 60 countries, 1982-2011. *Applied Econometrics and International Development*, 17(1), 19–36.
- Epaphra, M., & Mwakalasya, A. (2017). Analysis of foreign direct investment, agricultural sector and economic growth in Tanzania. *Modern Economy*, 08(01), 111–140.
- Harris, D. R., & Fuller, D. Q. (2014). Agriculture: definition and overview. *Encyclopedia of Global Archaeology*, 104–113.
- Jones, J., & Wren, C. (2016). *Foreign direct investment and the regional economy*. Routledge.
- Khan, M. A., & Khan, S. A. (2011). *Foreign direct investment and economic growth in Pakistan: A sectoral analysis*.
- Mitra, S. (2015). Effect of Foreign Direct Investment on GDP, Export and Domestic Investment: Bangladesh Perspective. *Journal of Innovation & Development Strategy (JIDS)*, 9(2).
- National Geographic. (2011). *The Art and Science of Agriculture*. Retrieved February 5, 2021, from <https://www.nationalgeographic.com/science/2011/02/02/02-05-agriculture-is-the-art-and-science-of-cultivating-the-soil-and-their-distribution-to-markets/>
- Qi, H. (2011). *The Definition of Investment and its Development: for the Reference of the Future BIT between China and Canada*. *RJT Ns*, 45, 541.
- World Bank. (2021). World Bank Indicators. Retrieved January 14.
- World Bank. (2021b). World Development Indicators: Structure of output. Retrieved January 14, 2021, from <http://wdi.worldbank.org/table/4.2>

LITERATUS is a journal published by Neolectura, issued two times in one year. Literatus is a scientific publication media in the form of conceptual paper and field research related to social impact and cultural studies. It is hoped that LITERATUS can become a media for academics and researchers to publish their scientific work and become a reference source for the development of science and knowledge.

**Our focus:**  
Social and Culture

**Our Scope:**  
Humanities, Education, Management, History, Economics, Linguistics, Literature, Religion, Politics, Sociology, Anthropology, and others.







<https://doi.org/10.37010/lit.v4i1.779>

Vol. 4, No. 1,  
April 2022,  
pp. 283-291

e-ISSN:  
**2686-5009**

*The Effect  
of Foreign Direct  
Investment on the  
GDP of the  
Agricultural  
Sector  
(Agriculture) in  
ASEAN  
Developing  
Countries*

**Dona Fitria,  
Pudji Astuty,  
D. Susilastuti**

