

Economic Determinants of Foreign Direct Investment (Fdi) in Agriculture Sector Based on Selected Developing OIC Countries: An Empirical Study on the Provincial Panel Data by Using Stata, 2003-2012

Intan Maizura Abdul Rashid, Nor'aznin Abu Bakar and Nor Azam Abdul Razak
*School of Economics, Finance and Banking, College of Business,
 Universiti Utara Malaysia, Kedah, Malaysia*

Email: intanmaizura@unimap.edu.my

Abstract

The purpose of the study aims to examine the economic determinants of Foreign Direct Investment (FDI) in Agriculture Sector based on selected developing OIC Countries. The agriculture sectors react as important keys in the expansion of any economy growth to eliminate the poverty issues. Therefore, the effective way to address poverty and eliminate the food deficit issues among the poorest people by enhancing the FDI in agriculture sector. Thus, besides the stimulation effect on growth, FDI can improve the quality of growth, and aid to achieving the goal of poverty reduction. In this study, the FDI in Agriculture Sector react as dependent variable and the independent variable economic determinant, list of economic growth, external debt, market size, exchange rate, size of government and natural resources in selected OIC Countries (Albania, Azerbaijan, Pakistan, Saudi Arabia, and Tajikistan). A provincial panel data from 2003 to 2012 and Pooled Ordinary Least Square (POLS), Random Effects Model and Fixed Effects Model are used to estimate the economic determinant effect of FDI in agriculture. After conduct several test such as Hausmen Test and Breusch and Pagan Lagrangian Multiplier Test, Pooled OLS Model is considered most appropriate model to apply in this study rather than Random Effects Model and Fixed Effects Model. The empirical results show that highly important in policy implementation that were related to the explanatory variables have significant effect on FDI in agriculture sector. Based on the empirical results, the government should be focused and paid attention all the determinants, particularly for external debt, market size and natural resources. These three determinants were the most significant with the foreign direct investment in Agriculture sector in OIC countries. However, the other three variables, economic growth, exchange rate and size of government will have the negative effect on FDI.

Keywords: OIC, FDI in Agriculture, economic growth, panel data, poverty

Introduction

This paper reviews the agriculture sector in member countries of Organization of the Islamic Cooperation (OIC), and pays specific attention to issues of determining the potential FDI in the sector. In addition, it reviews the experiences of agriculture investment in selected member countries with a view to identify potential roles for countries seeking FDI and their development partners in nurturing FDI intra OIC especially in the agriculture new investment. Incremental on the foods price viewed during the food crisis in year 2006 until 2008 triggered several serious harmful socio-economic impacts on the economies of many developing countries, including the OIC members. In addition, it created further poverty for millions of societies who were already distress from the hunger and poverty in these countries. In Low Income countries, they also exposed to these crisis

where inflation on price of goods and foods worsened the food security conditions. According to FAO's estimates, the world population will reach to 9.3 billion by 2050 with a 32 percent increase between 2012 to 2050. However, the OIC population is being projected to reach almost 2.7 billion with 66 percent increase which approximately two fold of the projected world population growth rate. Therefore, this study highlights the recent state of agricultural sector in the OIC Member Countries and poverty issues. According to Gerald Hübner, 2011, Azerbaijan is one of the country that have large of the recipients of FDI in Europe. Khalid Zaman, Iqtidar Ali Shah and Muhammad Mushtaq Khan (2011) do a research in Pakistan about foreign direct investment since the two factors are very important to the country, and there are, FDI variable and economic growth and at the same time can affect to socio economic development.

The 2015 International Conference on the Future of ASEAN (ICoFA 2015) Special Issue

Literature Review

Hakan Haktanir (2003) said that throughout the history, agriculture was very important in civilization to ancients' people. Therefore, ancients' society need depend on the agriculture because before this, there are no advanced technologies. But, nowadays, the agriculture are still becoming and lead as the primary source toward industry and employment around the world and in OIC countries also. Agriculture sector in OIC countries was conducted was for main necessity in people's life as human being. In addition, agriculture sector involved in food production and export activities even though the industrial sector was more productive. This is because agriculture is main material to product output.

Eugene Maghori (2014) study to find the relationship about the determinants of Foreign Direct Investments (FDI) in the Nigerian economy by using annual time series data. By utilize Error Correction Modeling (ECM) technique, the results show that in the short run and long run about the major determinant of foreign capital inflow in the economy is the ratio of external debt to Gross Domestic Product. Therefore, the research recommends that government need to place less emphasis on policies that encourage external borrowing. Other than that, the government should embrace those that strengthen and stabilize the economy. For instance, to maintain price and exchange rates stability by policies are designed, reduction in fiscal deficit, increase in domestic investments and the diversification of the economy for export trade among others.

Blomstrom et al. (1992) conclude there are positive relationship between the growth of income per capita and the average of the FDI inflows to GDP ratio in developing countries. In addition, according to Borensztein et al. (1998) there are negative relationship on FDI and economic growth at first but when they combined the factors of FDI and human capital accumulation on growth the result turn out to positive significantly.

According to Goswami Samai Haider, (2014), market size is an economic determinant of inward FDI that important to the need of firms such as MNCs. Market size are measured by GDP, per capita income or size of the middle class and it is very important for FDI. This is because, it will provides the potential for local sales, greater profitability of local sales to export sales and relatively diverse resources and effect the local sourcing more feasible. In the research also, there

are differ under different conditions between market size and growth. As referred to Nurudeen and Wafure (2010), based on the research result, exchange rate depreciation, market size of host country, deregulation and also instability of political are shown in the outcome of the principle determinants of FDI. The outcome show that the exchange rate have relation when explaining about changes in FDI and from that result 1% will affect increasing of 0.02. As conclusion based of the outcome, exchange rate depreciation will affecting the inflow of FDI and also depreciation in currency country can encourage the inflow of FDI.

Other than that, openness to trade also have the positive impact on FDI flows on the natural resources, however, higher financial development has negative effect on FDI inflows and East and Southern African sub-regions appear positively disposed to obtain higher levels of inward FDI. The key policy implications are discussed. (John C. Anyanwu, 2011)

According to Yijun Yuan Yanying Chen Lili Wang (2012), the government plays an important role especially in economy to allocate effectively social resources and avoid market failure. At the same time, it is good for reducing investment risks and in other hand policies can influence economy promptly. Besides, not good regulation that optimize the use of resources can affect the increasing of government size and at the same time become burden to society.

Research Problem

Today, many countries especially least developed and developing countries, suffer from unemployment, population growth, economic recession and income inequality issues. In fact, all thus issues related to human basic need and fundamental problems such as food security and poverty that still were facing by the whole world. Poverty is considered as a global crisis, it is complicated and multi-dimensional situation that not only tackle for the economic aspects. Moreover, the economic and food crises upon recent period more worsened this situation. An issue of poverty is one of the serious matters of concern that still become a vital agenda as debates on the post-2015 development goals strengthen. Indeed, by the year 2030, the World Bank aims to eliminate an extreme poverty in all countries. In the case of OIC countries, the level of poverty is very high compared to non-OIC countries. World Bank estimated the total OIC population that are still living not more than USD \$1.00 each day in the year 2008 until 2010 was 15.6 % higher compare

to the world average of 11.6% and developing countries average of 11.7%. Additionally, the total OIC population that are still living not more than USD \$1.25 each day about 31% higher compare to the world average of 14% and developing countries average of 17%.

Research Objectives

1. To investigate external debt and foreign direct investment about their relationship in agriculture sector in OIC countries.
2. To investigate the relationship between economic growth and foreign direct investment in agriculture sector in OIC countries.
3. To examine to what extent market size can influence foreign direct investment in agriculture sector in OIC countries.
4. To identify the effect of exchange rate towards foreign direct investment in agriculture sector in OIC countries.
5. To examine the relationship between size of government and foreign direct investment (FDI) in agriculture sector in OIC countries.
6. To identify the relationship between natural resources and foreign direct investment in agriculture sector of OIC countries.

Methodology

A provincial panel data from 2003 to 2012 and Pooled Ordinary Least Square (POLS), Random Effects Model and Fixed Effects Model are used to estimate the economic determinant effect of FDI in agriculture. After conduct several test such as Hausmen Test and Breusch and Pagan Lagrangian Multiplier Test, Pooled OLS Model is considered most appropriate model to apply in this study rather than Random Effects Model and Fixed Effects Model. Theoretical Framework

Pooled Ordinary Least Square (POLS)

$$(1) \text{ FDI}_{it} = f(\text{GNI}_{it}, \text{GDP}_{it}, \text{GDPP}_{it}, \text{GDPD}_{it}, \text{CONS}_{it}, \text{GDPR}_{it},)$$

The log-linear form of (1) is:

$$(2) \ln \text{FDI}_{it} = \alpha + \beta_1 \text{DEBT}_i + \beta_2 \text{GDP}_i + \beta_3 \text{EXC}_i + \beta_4 \text{SIZE}_i + \beta_5 \text{DEF}_i + \beta_6 \text{RENT}_i + \varepsilon_i,$$

Based on the equation (1), the positive sign of DEBT, GDP, SIZE, EXC, DEF, and RENT coefficients represent positive effects of external debt, economic growth, market size, exchange rate, size of government and natural resources on foreign direct investment in agriculture sector in OIC countries. The dependent variable is FDI in Agriculture. Therefore if the DEBT, GDP, SIZE, EXC, DEF, and RENT were increasing the FDI will decrease and vice versa. The hypothesis is listed below as:

Hypothesis 1

$$H_0: \beta = 0$$

$$H_1: \beta \neq 0$$

When the hypothesis is $\beta = 0$, where DEBT, GDP, SIZE, EXC, DEF, and RENT, so FDI in agriculture sector in OIC Countries connected with the other alternative hypothesis have no effect on which is $\beta \neq 0$, which if fewer than the lower bound significant value (0.05), then the null hypothesis is recognized. If the t-statistic value is higher than 0.05 significant value, then the null hypothesis is rejected, that the independent variables have significant effects on the dependent variable.

Random Effect method

$$(3) y = \alpha + X'it \beta + (u_i + v_{it})$$

A random effect model assumes that individual effect (heterogeneity) is not correlated with any regressor and then estimates error variance specific to groups, hence, u_i is an individual specific random heterogeneity or a component of the composite error term, at the same time, random effect model is also called an error component model. A random effect model is estimated by generalized least squares (GLS) when a covariance structure of an individual i , Σ (sigma), is known.

Fixed Effect method

$$(4) y_{it} = \alpha + \beta X_{it} + u_i + v_{it}$$

$$y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + u_i$$

where, u_i represents individual specific effect and v_{it} represents remainder disturbance that varies over time and entities capturing everything that is left

unexplained about y_{it} . Fixed Effects Model, need to apply tests to check whether Fixed Effects should indeed be included in the model. To do this the standard F-test can be used to check Fixed Effects against the simple constant OLS method. A fixed group effect model examines individual

differences in intercepts, assuming the same slopes. According to Breusch and Pagan, 1980, fixed effect model is estimated by least squares dummy variable (LSDV) regression and within effect estimation methods.

Data Collection Methods

Table 1: Unit Measurement for all variables

| Variable | Abbreviation | Unit of Measurement | Sources |
|---------------------------|--------------|--|-----------------|
| External Debt | ED | external debt stocks (% of GNI) | World Bank Data |
| Economic Growth | EG | GDP growth (annual %) | World Bank Data |
| Market Size | GDP | GDP per capita growth (annual %) | World Bank Data |
| Exchange Rate | RATE | Inflation, GDP deflator (annual %) | World Bank Data |
| Size of Government | GOV | General Government Final Consumption Expenditure (annual % growth) | World Bank Data |
| Natural Resources | RENT | Total Natural Resources Rents (% of GDP). | World Bank Data |
| Foreign Direct Investment | FDI | FDI in agriculture sector | FOA |

Findings and Conclusion

Pooled OLS

Table 2: Pooled Ordinary Least Square (OLS) of all variables

| FDI | Coefficient | Std. Err. | t | P> t |
|--------------------|-------------|-----------|-------|-------|
| External Debt | .0143881 | .0584831 | 0.25 | 0.807 |
| Economic Growth | -.7495968 | .5861929 | -1.28 | 0.208 |
| Market Size | .4940614 | .5526811 | 0.89 | 0.376 |
| Exchange Rate | -.0630145 | .0752901 | -0.84 | 0.407 |
| Size of Government | -.0780751 | .0716393 | -1.09 | 0.282 |
| Natural Resources | .1037357 | .0536166 | 1.93 | 0.060 |

Pooled GLS

Table 3: Pooled Generalized Least Square (GLS) of all variables

| FDI GSL | Coefficient | Robust Std. Err. | z | P> z |
|--------------------|-------------|------------------|-------|-------|
| External Debt | .0903042 | .0598399 | 1.51 | 0.131 |
| Economic Growth | -2.660081 | .5331149 | -4.99 | 0.000 |
| Market Size | 2.424641 | .4662488 | 5.20 | 0.000 |
| Exchange Rate | -.0950402 | -.0950402 | -1.16 | 0.245 |
| Size of Government | -.0271695 | -.0271695 | 2.12 | 0.507 |
| Natural Resources | .2510502 | .2510502 | 0.38 | 0.034 |

Random effect Model

Table 4: Random Effects of all variables

| FDI | Coefficient | Robust Std. Err. | z | P> z |
|--------------------|-------------|------------------|-------|-------|
| External Debt | 0.0143881 | 0.0885809 | 0.16 | 0.871 |
| Economic Growth | -0.7495968 | 0.7006613 | -1.07 | 0.285 |
| Market Size | 0.4940614 | 0.4617305 | 1.07 | 0.285 |
| Exchange Rate | -0.0630145 | 0.0514527 | -1.22 | 0.221 |
| Size of Government | -0.0780751 | 0.0796595 | -0.98 | 0.327 |
| Natural Resources | .1037357 | .1336546 | 0.78 | 0.438 |

Fixed Effect Method

Table 5: Fixed Effects of all variables

| FDI Fixed Effects | Coefficient | Std. Err. | T | P> t |
|--------------------|-------------|-----------|--------|-------|
| External Debt | 0.0734051 | 0.0563623 | 1.30 | 0.263 |
| Economic Growth | -3.085279 | 0.1749818 | -17.63 | 0.000 |
| Market Size | 2.757528 | 0.1894099 | 14.56 | 0.000 |
| Exchange Rate | -0.143947 | 0.0886611 | -1.62 | 0.180 |
| Size of Government | -0.0173844 | 0.0430544 | -0.40 | 0.707 |
| Natural Resources | 0.4165213 | 0.08643 | 4.82 | 0.009 |

Comparison OLS, Random Effects & Fixed Effects

Table 6: Comparison OLS, Random Effects & Fixed Effects

| FDI | OLS | Random | Fixed |
|--------------------|------------|------------|------------|
| External Debt | .01438811 | .01438811 | .07340515 |
| Economic Growth | -.74959676 | -7.4959676 | -3.0852795 |
| Market Size | .49406139 | .49406139 | 2.7575279 |
| Exchange Rate | -.06301446 | -.06301446 | -.143947 |
| Size of Government | -.07807515 | -.07807515 | -.01738444 |
| Natural Resources | .10373573 | .10373573 | .41652135 |

Hypothesis Results

Table 7: The Hypothesis Statement

| No of Hypothesis | Statement of Hypothesis | Results |
|------------------|--|----------|
| H1 | There is a relationship between external debt and foreign direct investment (FDI) in agriculture sector in OIC countries. | Accepted |
| H2 | There is a relationship between economic growth and foreign direct investment (FDI) in agriculture sector in OIC countries. | Rejected |
| H3 | There is a relationship between market size and foreign direct investment (FDI) in agriculture sector in OIC countries. | Accepted |
| H4 | There is a relationship between exchange rate and foreign direct investment (FDI) in agriculture sector in OIC countries. | Rejected |
| H5 | There is a relationship between size of government and foreign direct investment (FDI) in agriculture sector in OIC countries. | Rejected |
| H6 | There is a relationship between natural resources and foreign direct investment (FDI) in agriculture sector in OIC countries. | Accepted |

The 2015 International Conference on the Future of ASEAN (ICoFA 2015) Special Issue

The empirical results show that highly important in policy implementation that were related to the explanatory variables have significant effect on FDI in agriculture sector. Based on the empirical results, the government should be focused and paid attention all the determinants, particularly for external debt, market size and natural resources. These three determinants were the most significant with the foreign direct investment in Agriculture sector in OIC countries. However, the other three variables, economic growth, exchange rate and size of government will have the negative effect on FDI.

References

Anyanwu, John C. (2011), Determinants of Foreign Direct Investment Inflows to Africa, 1980-2007, Working Paper Series No. 136, African Development Bank, Tunis, Tunisia.

Asiedu, Elizabeth (2002). On the Determinants of Foreign Direct Investing to Developing Countries: Is Africa Different? *World Development*, Vol.30, No.1, 107-119. Retrieved on June 25, 2008 from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=280062

Blomstrom, M., Lipsey, R., and M. Zejan. (1992): "What Explains Developing Country Growth?" NBER Working Paper, No. 4132.

COMCEC (2013) COMCEC Strategy. Ankara: COMCEC Coordination Office. (2013)

FAO.2009b. Report of the Sub-Regional Data Centers Coordinators Meeting (AFROFOODS). Call for Action from the Door of Return, Dakar, 10 December 2009. (available at <http://www.fao.org/infoods/AFROFOOD%20CALL%20APPEL.pdf>).

Goswami, G. G., & Haider, S. (2014). Does political risk deter FDI inflow? An analytical approach using panel data and factor analysis, *Journal of Economic Studies*, 41(2), 233-252.

Hakan Haktanur. (2003). State of Food and Agriculture in the OIC Countries. *Journal of Economic Cooperation*. 24(4), 33-80.

IMF (1993). Balance of Payment Manual (5th edition). Washington D.C. Retrieved on May 2, 2008 from <http://www.imf.org/external/np/sta/bop/BOPman.pdf>

Khalid Zaman, Iqtidar Ali Shah, Muhammad Mushtaq Khan, & Mehboob Ahmad, (2012). Macroeconomic factors determining FDI impact on Pakistan's growth. *South Asian Journal of Global Business Research*. 1(1), 79 – 95.

Licai Lv, Simei Wen, Qiquan Xiong, (2010) Determinants and performance index of foreign direct investment in China's agriculture, *China Agricultural Economic Review*, 2(1), 36 – 48.

Wafure, O.G. and A. Nurudeen (2010) Determinants of foreign direct investment in Nigeria: An empirical analysis. *Global Journal of Human Social Science*, 10(1): 26-34.

Yuan, Yijun, Chen, Yanying & Wang, Lili. (2010). Size of government and FDI: an empirical analysis based on the panel data of 81 countries. *Journal of Technology Management in China*, 5(2), 176-184.