The Nexus of Selected Macroeconomic Variables Toward Foreign Direct Investment: Evidence from Indonesia

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ABSTRACT
Foreign Direct Investment (FDI) inflows are a major instrument of economic growth in developing countries. Indonesia is one of the developing countries that has received more FDI with macroeconomic stability. The macroeconomic stability indicator is seen as an important factor in driving economic growth and attracting FDI inflows in Indonesia. Therefore, this study examines the relationship of selected macroeconomic variables towards FDI in Indonesia over the period 1980–2019. Using Autoregressive Distributed Lag (ARDL), the empirical results show that market size, domestic investment, government spending, and foreign exchange rate are the key factors influencing long-run FDI inflows. However, financial development reveals no relationship with FDI inflows in Indonesia. Overall findings indicate that macroeconomic variables influence FDI inflows. These findings guide policymakers in formulating new policies to ensure the macroeconomic indicators’ stability in driving economic growth.

Keywords: FDI Inflows, Macroeconomic Variable, ARDL and Indonesia

INTRODUCTION
In the past few decades, Foreign Direct Investment (FDI) has seen a remarkable increase in world production and trade (UNCTAD, 2018). In addition, FDI is an important source of uncertainty in influencing the economic development of developing countries (Radulescu and Druica, 2014). The increase in foreign capital is one of the important aspects of globalisation. In this flow, FDI provides an advantage to the country of origin and host. FDI also has a positive impact on economic growth while bringing new capital, technology, knowledge, and management skills to the host country. From this aspect, FDI contributes to an increase in the level of employment in the host country as well as the reduction of production costs through lower labour costs. This stability also contributes to the attraction of greater FDI volumes.

In addition, economic liberalisation has been a driving factor for increased capital flows that contribute to institutional and market development strategies for host countries and countries of origin. FDI provides important advantages to the host countries where competition between developing countries will attract more FDI. On the other hand, the choice of country to invest in is an important decision. When making this decision, investors need to consider specific factors, for example, the market size of the host country, which is important as it shows the demand structure of that country. Foreign investors also need to consider the openness of host countries with the global markets (Karacan, 1997). The effect of macroeconomic variables on the FDI of a country is of great importance to investors. The critical issue is foreign firms must choose countries that are less risky and more stable. The host countries need to promote the stability of macroeconomic indicators.

Identifying the dynamic relationship between macroeconomic variables and FDI inflows into the country is complicated due to the stability factor in the host country. However, academics mention that there are specific factors that determine FDI inflows. For example, Dunning (1977) through the Eclectic Theory states that Ownership, Location, and Internationalization (OLI) factors are the dominant factors in analysing the determinants of FDI. However, FDI inflows are seen to be more concentrated in economies where they are easy to own with location advantage through the internationalisation of investments (UNCTAD, 1998). This study also focuses on the impact of selected macroeconomic variables on FDI in Indonesia from the year 1980 until 2019. The main question of this study is to identify the most significant influential factors of FDI in Indonesia by focusing on important variables that affect FDI. The research objective of this paper is to investigate the long-run relationship between the macroeconomic variable and FDI inflows in Indonesia.

The structure of this study is arranged as follows. The second section describes a brief history of FDI and macroeconomic stability in Indonesia. The third section explains the relevant literature of FDI and macroeconomic indicator examined. In the fourth section, the methodologies, econometric models, and data used are reviewed. The last section presents the empirical results and conclusions.
FDI in Indonesia Scenario

Indonesia is a strategic country in Asia. The strategic location acts as a gateway to the Southeast Asian region with the emergence of new economic markets. Indonesia is also known as the country with the fastest reforms in the last few years. Indonesia’s strategic position has made FDI an important element in economic development. Indonesian economic development is also seen as a factor as one of the key destinations of foreign investors in the Asian region. Indonesia has become one of the best countries in Asia for being the focus of foreign investors. Various international organisations are interested in making Indonesia their investment destination. The main sources of FDI in Indonesia are from Singapore, China, Hong Kong, Japan, and Malaysia. Through diverse sources, Indonesia plays an important role in promoting the local economy to attract foreign investment in the form of incentives. Economic development in Indonesia occurs with an increase of purchasing power of the society and the per capita income although still on a small scale.

The growing domestic demand makes Indonesia one of the developing countries in the middle class. This development pushes Indonesia as a country that is rich in natural resources such as gold, nickel, copper, coal, oil and gas, bauxite, and geothermal energy. In addition, Indonesia is also famous for its large population of almost 270.6 million (UNCTAD, 2020) and is one of the countries with the largest labour force with a large market. In terms of FDI inflows among Southeast Asian countries, Indonesia has FDI stocks amounting to USD24.99 billion in 2019 (UNCTAD, 2020). Indonesia was one of the countries severely affected during the Asian Financial Crisis which resulted in a severe decline in FDI inflows in 1998. This situation is shown in Figure 1, which is the trend of Indonesian FDI inflows from 1980 to 2019. Figure 1 shows the FDI trend in Indonesia which faces a major decline after the 1997 crisis with a negative value. This decline was recorded in 1991 and reached its lowest level in 2000. This mainly affected Indonesia’s economic growth.

The Indonesian economy finally recovered in 2000 with a growth of 4.8 percent. The record proves that Indonesia was able to overcome economic slowdown with an increase in the economic growth of 3.3 percent in 2000 as reported by ADB (2002). FDI growth in Indonesia has increased rapidly over the past four years. A report by UNCTAD (2019) states that in 2018, FDI investment in Indonesia reached USD21 billion and increased from 2017. Based on data from the UNCTAD (2019), the FDI level increased to USD13 billion in the second quarter of 2019 particularly in the electricity, gas and water, transport, and telecommunications sectors. In addition, FDI growth in Indonesia is also driven by changes in economic policy implemented by the Indonesian government. In terms of FDI inflows, Indonesia has been influenced by the continuous changes in economic, social, political, and financial changes.

Figure 1. Indonesia FDI Amount between 1980-2019 (in USD million)

This situation has encouraged foreign investors to invest in Indonesia with a variety of natural products. The main attraction that Indonesia has is the availability of natural resources in Indonesia. Therefore, the factor becomes an incentive to investors in finding new resources to develop. Indonesia is an ASEAN country that has successfully attracted FDI. Since 2000, FDI has been an important factor in economic growth in Indonesia.

LITERATURE REVIEW

The stability of macroeconomic variables is the key factor that drives FDI inflows. There has been empirical analysis of the relationship between FDI and determinants in response to the dynamics of the investment environment. According to previous studies (e.g., Ang, 2008; Athukorala & Wagle, 2013), the market size has been proven to be one of the key factors that drives FDI inflows by many past empirical studies. It shows that the increase in market size influences the increase in FDI inflows into the host economy. It is necessary to consider market size as an important factor in attracting FDI inflows to a country (Asiedu, 2002) but not all results obtained show a positive relationship on FDI. At the same time, market size is not the only factor influencing FDI. A study by Bevan and Estrin (2004) found that GDP has a significant but negative impact on FDI. Although the market size is increasing, foreign investors are less willing to invest in host countries where they are less confident (Wafure & Nurudeen, 2010).

Many economists have paid attention to the relationship between financial development and FDI. Several previous studies have investigated the impact of financial development on FDI. According to previous studies (e.g., Erdogen et al., 2015; Shah et al., 2016; Kaur, 2013; Ashraf, 2010; Hermes and Lensink, 2003), financial development acts as a prerequisite for a positive influence of FDI. Elikplimi et al. (2013) found that there was a two-way relationship between financial development and FDI. Ang (2008) also showed that financial development had a positive and significant impact on FDI inflows in Malaysia. Meanwhile, results from Sofian and Sidiroopoulos (2010) showed that financial development did not have a significant impact on FDI. However, all results are mixed and no comprehensive study has been conducted on the impact of financial development on FDI inflows in developing countries.
Kumari (2017) found that there was a negative and significant relationship between domestic investment and FDI. This suggested that private investment, such as public investment, could also attract FDI through the reduction of transaction costs, encouraging the division of labour between firms, and the spread of technology (Lautier et al., 2012). Thus, a high level of domestic investment can signal a healthy domestic economy to foreign firms. According to previous studies (e.g., Williams, 2015; Panigrahi, 2012), there was a positive and significant relationship between domestic investment and FDI inflows. Several studies in developing countries, such as in Nigeria (Jong, 2015), found that domestic investment had a negative sign. Nevertheless, most of the literature showed more positive relationships between domestic investment and FDI inflows.

Government spending is one of the government intervention strategies to balance the market in ensuring continued economic growth. Adjustments in government spending ensure economic stability as well as generate and accelerate economic growth by promoting employment opportunities (Ahuja, 2013). Strong institutions with quality infrastructure also attract FDI (Alam & Shah, 2013). Gwartney, Lawson, and Hall (2012) and Wu and Heerink (2016) used public spending to reflect the level of government intervention in economic freedom. Higher government spending was linked with development spending through infrastructure development, creating a stronger environment and institutions to attract more FDI inflows (Noorbakhsh et al. 2001; He and Sun, 2014). A study by Othman et al. (2018) showed that government spending had a positive relationship with FDI inflows in the long run. However, unproductive spending did not boost economic growth and did not attract FDI.

Previous research has investigated the relationship between exchange rates and FDI inflows, showing mixed results across the country. Some studies (e.g., Omorokunwa and Ikponmwenosa, 2014; Melku, 2012) showed that FDI had a positive relationship with the exchange rate, but some showed the opposite. In general, different relationships depend on the exchange rate used by the researcher. Osinubi and Amaghionyeodwo (2009) found a negative impact on real FDI inflows that might be due to deregulation accompanied by exchange rate fluctuations. Several studies have shown that such relationships tend to be weak, as in the study by Nyarko et al. (2011) in Ghana and the study by Kapur (2004) in Nigeria. Thus, despite mixed results on the relationship between exchange rate and FDI in the previous literature, there is a possibility of the existence of asymmetric exchange rate effects on the FDI inflows (El Bejaoui, 2013).

Overall, FDI is seen as an interaction with foreign countries and a key element of a country’s industrial development. Thus, there is a complementary relationship between FDI inflows with macroeconomic variables. Moreover, FDI not only boosts economic growth but also indirectly has a positive interaction effect towards macroeconomic variables. However, some previous findings did not provide a clear conclusion that the macroeconomic variables influenced FDI inflows.

METHODOLOGY

To ensure comprehensive research, the model used by Imoghele (2016) serves as a guide for this study. Usually, the model assumes the following forms of function:

$$\text{FDI} = f (\text{Mkt}, \text{FD}, \text{DI}, \text{GC}, \text{ER})$$

(1)

where FDI is FDI inflows (percent of GDP) and (Mkt) refers to market size measured by real GDP growth based on constant 2010. FD refers to the value of the M2 money supply to GDP which represents financial development. DI represents the value of gross fixed capital formation against GDP as domestic investment. ER represents the value of the real effective exchange rate, which measures the development of the real value of a country’s currency, and IN represents the value of percentage in the consumer price index representing the rate of inflation. The log-linear form (L) of each variable in the above equation is shown as follows:

$$\text{LFDI}_t = \alpha_0 + \beta_1 \text{L} \text{Mkt}_t + \beta_2 \text{LFD}_t + \beta_3 \text{LDI}_t + \beta_4 \text{LG}_t + \beta_5 \text{LER}_t + \epsilon_t$$

(2)

For consistent results, all variables were converted to natural logarithms to reduce the problem of heteroscedasticity. The Autoregressive Distributed Lag (ARDL) model was used in this study because it can establish short-run and long-run relationships simultaneously at a time. The ARDL model was preferable because it took the stationary level of the mixture, for example, I(0) and I(1) but cannot exceed I(1). Before testing cointegration, the time series of the variables should be examined. This study used Augmented Dickey-Fuller (ADF) and Philip-Peron (PP) tests for unit root. To do this, the ARDL model proposed by Pesaran (2001) was developed.

$$\Delta \text{LFDI}_t = \beta_0 + \delta_1 \text{LDI}_{t-1} + \delta_2 \text{LGC}_{t-1} + \delta_3 \text{LER}_{t-1} + \sum_{i=1}^{s} \beta_i \Delta \text{LFDI}_{t-i} + \epsilon_t$$

(3)

where $\Delta$ is the first degree of differentiation and $(\mu t)$ is the residual term in the time period $t$ with the level of lag selection in ARDL model estimation. The practical rule is that if the F-statistic exceeds the value of the upper critical bound, then the null hypothesis is rejected; if the F-statistic is between the critical bound, the result are inconclusive and if the F-statistic is less than the critical bound, then the null hypothesis cannot be rejected. The importance of the error correction model lies in its ability to correct false regression results in time series data. The ECM is defined as:

$$\Delta \text{LFDI}_t = \beta_0 + \sigma \text{ECM}_{t-1} + \sum_{i=1}^{p} \beta_i \Delta \text{LFDI}_{t-i} + \sum_{i=0}^{q} \delta_i \Delta \text{Mkt}_{t-i} + \sum_{i=0}^{r} \gamma_i \Delta \text{LFDI}_{t-i} + \sum_{i=0}^{s} \omega_i \text{LDI}_{t-i} + \sum_{i=0}^{t} \varphi_i \text{LGC}_{t-i} + \sum_{i=0}^{u} \eta_i \text{LER}_{t-i} + \epsilon_t$$

(4)

where $\sigma$ represents the error correction coefficient ECM. $\text{ECM}_{t-1}$ is the equilibrium ECM that indicates the degree of the velocity of change the equilibrium which is expected to have a negative value and $(\mu t)$ represents the long-run model referring to equation (3).
RESULTS
The results of selected macroeconomic variables towards FDI in Indonesia began with the basis of analysis that was the root unit test. In this study, the root unit test has been highlighted, namely Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The results of the study through Table 1 show that the variables are stationary at levels I(0) and the first difference I(1).

Table 1. Unit Root Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test</th>
<th>Intercept</th>
<th>Intercept and trend</th>
<th>Intercept</th>
<th>Intercept and trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFDI_t</td>
<td>Level</td>
<td>-1.3683(0)</td>
<td>-2.6903(0)</td>
<td>-4.56739**</td>
<td>-2.60122</td>
</tr>
<tr>
<td>LMKt_t</td>
<td></td>
<td>-4.5905(0)**</td>
<td>-4.5069(0)**</td>
<td>-2.91333*</td>
<td>-4.48141***</td>
</tr>
<tr>
<td>LFD_t</td>
<td></td>
<td>1.0298(1)</td>
<td>1.7951(1)</td>
<td>2.72277</td>
<td>1.56208</td>
</tr>
<tr>
<td>LD_t</td>
<td></td>
<td>1.8025(1)</td>
<td>1.9653(1)</td>
<td>-1.66261</td>
<td>-1.81338</td>
</tr>
<tr>
<td>LGC_t</td>
<td></td>
<td>-5.0242(0)**</td>
<td>-5.0776(0)**</td>
<td>-5.024259***</td>
<td>-5.077678***</td>
</tr>
<tr>
<td>LER_t</td>
<td></td>
<td>-2.3798(0)</td>
<td>-2.4059(0)</td>
<td>-2.34984</td>
<td>-2.36115</td>
</tr>
<tr>
<td>LFDI_t</td>
<td>First</td>
<td>-7.6632(0)***</td>
<td>-7.5644(0)***</td>
<td>-7.48914***</td>
<td>-7.46969***</td>
</tr>
<tr>
<td>LMKt_t</td>
<td></td>
<td>-5.7144(0)**</td>
<td>-5.6296(0)**</td>
<td>-15.5587***</td>
<td>-16.5507***</td>
</tr>
<tr>
<td>LFD_t</td>
<td>difference</td>
<td>-3.2071(0)**</td>
<td>-3.9447(0)**</td>
<td>-3.14830**</td>
<td>-3.90297**</td>
</tr>
<tr>
<td>LDI_t</td>
<td></td>
<td>-4.4683(0)**</td>
<td>-4.4041(0)**</td>
<td>-4.46838***</td>
<td>-4.40409***</td>
</tr>
<tr>
<td>LGC_t</td>
<td></td>
<td>-7.5791(1)***</td>
<td>-7.4679(1)***</td>
<td>-26.47766***</td>
<td>-26.46344***</td>
</tr>
<tr>
<td>LER_t</td>
<td></td>
<td>-8.1252(0)***</td>
<td>-8.0713(0)***</td>
<td>-8.42300***</td>
<td>-8.53955***</td>
</tr>
</tbody>
</table>

Notes: ***, ** and * are significant levels at 1 percent, 5 percent and 10 percent.

The next step was to analyse the long-run relationships between variables. In this study, the ARDL test was adopted because this approach was synonymous with short-time series data analysis as emphasised by Pesaran et al. (2001). Table 2 shows the results obtained which give an absolute solution because the estimated F-statistic value exceeds the critical value of the upper bound I(1). It is reported that the results show that the F-statistical value in Indonesia (5.2496) is greater than the critical value of the upper bound I(1) at a significant level of 1 percent. Therefore, it is confirmed that the model shows a long-run relationship between the variables in Indonesia.

Table 2. ARDL Test

<table>
<thead>
<tr>
<th>Model</th>
<th>f-statistic</th>
<th>Null Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2, 0, 0, 0, 0)</td>
<td>5.2496*</td>
<td>Reject</td>
</tr>
</tbody>
</table>

Critical Value

| 1 Percent | 3.06 | 4.15 |
| 5 Percent | 2.39 | 3.38 |
| 10 Percent | 2.08 | 3.00 |

Note: 1. * and ** are significant at the rates of 1 percent and 5 percent. 2. F-bound critical value based on Pesaran (2001) critical value table.

To measure the level of long-run and short-run relationships between the variables, the ARDL-ECM analysis, and the full results are reported through Table 3. Table 3 shows the result for Indonesia with several variables as determinants in FDI inflows. There are significant and positive signs detected between market size (LMkt) and FDI inflows in Indonesia. A 1 percent increase in market size will affect an increase in FDI inflows by 0.62 percent respectively. Globerman and Shapiro (2003) conclude that the largest market size indicates the country’s dynamics in producing higher quality goods and services that attract higher total FDI inflows. The impact of financial development (LFD) is not significant on FDI inflows. This reveals that financial development may be unstable due to several political situations such as the political instability thus reducing the confidence of potential foreign investors to invest in the country. Domestic investment (LDI) is positively and statistically significant. A 1 percent increase in domestic investment will increase FDI inflows by 0.48 percent respectively. The positive and significant effect of government consumption (LGC) on FDI inflows is present in Indonesia. A 1 percent increase in government consumption will increase FDI inflows by 0.60 percent. In this case, the past economic reforms fully utilise their resources by creating an environment conducive to domestic and foreign investments. Finally, the exchange rate (LER) reflects a significant negative relationship with FDI inflows which implies that the exchange rate will reduce the respective FDI inflows by 0.03 percent.
In the short run, a coefficient of error correction (ECM) is carried out to estimate the equilibrium speed of the dependent variable after the change of the variable. The error correction coefficient shows a significant result at a significance level of 1 percent indicating the existence of adjustment in the short run and equilibrium in the long run. Findings in Indonesia show that the value of the ECM is 0.80 which refers to 80 percent of the imbalance that occurs because the fall in the previous year can be readjusted with the current year's balance in the long run. An r-squared value of 0.93 indicates that 93 percent of the variables explain the dependence on FDI. In conclusion, evidence of macroeconomic variables towards FDI inflows supports the hypothesis that macroeconomic factors play a role in attracting FDI inflows. This result is similar to Dunning (2009) that supports the macroeconomic factors which are the important elements in influencing investors' decisions to invest in host countries. These implications can help promote a dynamic competitive advantage in the host country and at the same time contributes to FDI inflows in Indonesia.

Table 4 shows the results that include a variety of diagnostic stability tests for all macroeconomic indicators. Based on the results, the proposed model is free from econometric problems. In general, the study model does not experience any diagnostic problems as reported because no probability value obtained is smaller than the critical value at the 5 percent level. The CUSUM and CUSUMQ diagrams also do not provide any situation beyond the equilibrium boundary of the estimation model. In conclusion, the estimation of the ARDL model together with the lag selection meet the basic requirements of the econometric model.
technological skills. According to UNCTAD (2019), FDI inflows in Indonesia have reached the highest level. Strong macroeconomic growth, as well as a robust legal framework, drive Indonesia's attractiveness as an investment destination. In addition, fast-growing digitalisation also facilitates investment in technologies. Therefore, inter-sectional management efficiency is essential for balanced economic development in the emergence of new markets in Indonesia. In conclusion, developing countries, such as Indonesia, need to ensure the stability of macroeconomic indicators, the efficiency of infrastructure, and the stability of external financial debt to ensure rapid economic growth to attract FDI inflows.

References


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