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OUTWARD FDI AND ITS IMPLICATION ON INDONESIAN DOMESTIC INVESTMENT

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ABSTRACT

Since becoming a democratic country in the late 1990s, Indonesia has been changing into a more promising countries with a remarkable reduction in poverty by more than 50% during the last decade. To achieve a developed or high-income country, Indonesia must grow by 8% to 9% annually with huge investment is needed in every sector, ranging from infrastructure to human development in the digital era. Apart from strengthening tax revenue collection, Indonesian government must also investigate the role of outward foreign direct investment (OFDI) that potentially affects domestic investment in the negative way. Hence, it is the objective of this study to examine the impact of OFDI on Indonesian domestic investment for the period between 1980 and 2018. By applying vector error correction model, we observe that OFDI has significant adverse effect on domestic investment. With current inflows of foreign direct investment (FDI) has also never reached to the level prior to the 1997 economic crisis, discouraging the outflows of FDI could be a desirable strategy.

Keywords: outward FDI, domestic investment, Indonesia, time series analysis, divestment

INTRODUCTION

Rate of capital formation will have a strong effect on economic growth rate (Levine & Renelt, 1992). With generally low fund available in developing countries, foreign

direct investment (FDI) could be the most important source of fund of domestic capital formation.[1] Many studies have confirmed the growth-enhancing role of FDI to host countries, either in the case of developed (Barrell & Pain, 1997; Freckleton et al., 2012) or developing countries (Balasubramanyam et al., 1996; Borensztein et al., 1998; Yao & Wei, 2007; Alguacil et al., 2011). Particularly, capital-poor developing countries can be better-off in the long run if they can eschew foreign capital, especially FDI (Firebaugh, 1992). Regardless of the benefits of inflows of FDI,[2] which was mainly in the past coming from developed countries, the recent trend shows that developing countries have also been growing as the new sources, or capital providers of FDI at global level. In 1995, outward foreign direct investment (OFDI) from developing countries constituted merely 4% of global FDI flows. However, the share in 2015 has reached a record of one-fifth of global FDI. Moreover, more developing countries have offered FDI in the recent list of contributors. With less than 90 developing countries were marginally involved in OFDI in 1990s, the list has risen to 109 countries, with 26 of these countries are having an OFDI-to-GDP ratio of 10% or more, today. While OFDI may signal the growing strength of firms in many developing countries economically, but the leakage of investment fund from domestic market may dampen the progression of economic development of the home developing countries.

Figure 1 highlights the pattern of domestic investment in the selected Asian countries, Indonesia, and its neighbouring countries.[3] What can be justified from Figure 1 is the remarkable level of domestic investment prior to the 1997 Asian economic crisis, particularly Malaysia and Thailand. These two countries recorded the highest level of domestic investment, surpassing relatively developed South Korea in the third place. Indonesia generally does not show a consistent pattern of domestic investment. Nevertheless, Indonesian domestic investment remains at fourth place after South Korea before the wake of the 1997 Asian economic crisis, which is in better position than the uprising new economies of Vietnam and India. However, it falls into the last place immediately after the crisis and took more than 10 years for Indonesia to be able to recover the level of domestic investment just before the crisis. Interestingly, in the recent years, Indonesia has been at the top level relative to other Asian countries, completely in contrast to the sharp drop in domestic investment in Malaysia and Thailand.

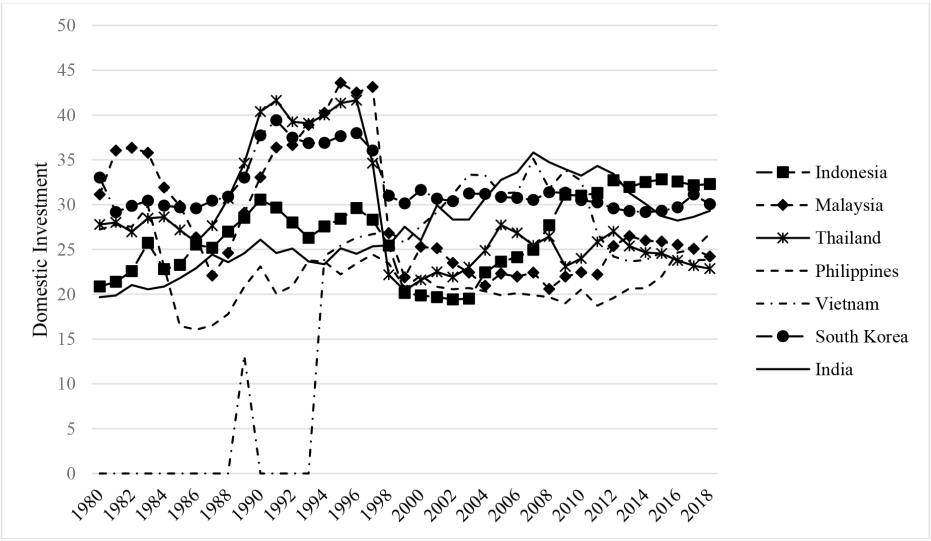

Figure 1. Domestic investment (as in % of GDP) in the selected Asian countries
Note: Domestic investment is represented by gross fixed capital formation. Poor information on domestic investment in Vietnam prior to 1994 should caution as the reading of the figure should only be valid from 1994.
Source: World Bank (2019)

With the pattern of domestic investment as shown in Figure 1, we are curious about the source of Indonesia's domestic investment behaviour. Among the primary sources of domestic investment is inward FDI (IFDI) from multinational corporations (MNCs) and credit by domestic financial institutions, while the leakage could come from OFDI. Interestingly, the take-off of Indonesian economy in 1980s, which is partly due to the IFDI but surprisingly is accompanied also by uprising outflow of FDI from Indonesia. Nothing much has been mentioned in the past studies regarding OFDI from Indonesia, but referring to high income inequality in Indonesia, we suspect this could be due to low prospect of growth in Indonesia and the rich are seeing more opportunities overseas. Throughout 1980s also we could see that the highly expected IFDI did not helpful with limited inflows recorded.[4] The sharp decline in IFDI is fortunately shadowed by low but still positive OFDI from Indonesia. Combination of both low IFDI and positive OFDI could explain why Indonesia took more than 10 years to recover from crisis. Meanwhile, high IFDI and almost zero OFDI might explain why Indonesian domestic investment is currently at the highest relative to other six Asian countries to strongly support Indonesian economic development.

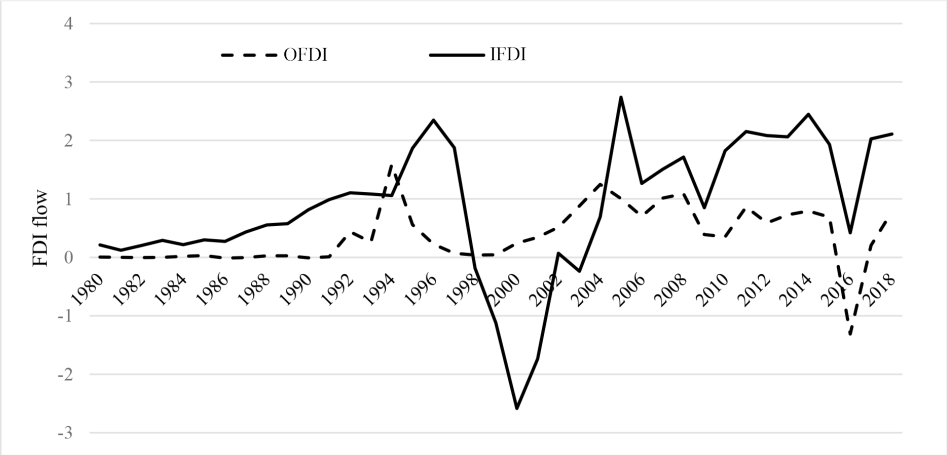

Figure 2. OFDI and IFDI (as in % of GDP)
Source: World Bank (2019) and UNCTAD (2019)

One interesting point to note from Figure 2 is about the behaviour between OFDI and IFDI. Both are generally moving together in the same direction. For instance, between 1993 and 1997 Indonesia enjoyed huge inflows of FDI and at the same time OFDI also reached its peak. Similarly, between 2004 and 2016, high and positive IFDI was accompanied by positive close to 1% outflows of FDI from Indonesia. Although the recent slump in FDI inflows in 2017 was also followed by negative outflows of FDI by Indonesian, the latest surged in IFDI is also closely matched by resurgence of OFDI. With domestic investment is badly needed to rebuild Indonesian economy, the strategies to improve domestic investment could not be limited on encouraging more FDI inflows. The strategy should also include on how to discourage OFDI from Indonesia if the outflows are significantly large to deter economic development in Indonesia. Nevertheless, whether discouraging OFDI would be a desirable strategy, it depends on its implication on domestic investment. Hence, it is the objective of this study to examine the effect of OFDI from Indonesia on Indonesian domestic investment.

LITERATURE REVIEW

GDP vs. Domestic Investment

Theoretically, domestic investment has been one of four core components of gross domestic product (GDP). More investment is expected to bring in more GDP or economic growth. As more investment done by businesses, as their businesses expanded, more employment opportunities created, each worker will earn more

and more demand will take place. Eventually, GDP will increase. Investment in capital and research and development (R&D), in which technology is embedded will particularly be vital to long run economic growth. In fact, investment can also be done on human capital development, which will bring more talent for future innovation and therefore, induce higher GDP in the future. Using multiplier effect, simple investment in various economic activities creates more than proportionate amount of increment in GDP. For instance, Green (1997) observes that residential investment causes GDP, and not vice versa.[5]

On the other hand, under the perfect mobility assumption, Feldstein and Horioka (1980) predict that there will be no relationship between saving and investment.[6] Although this argument has received support from Herwartz and Xu (2009), studies such as Miller (1988), De Vita and Abbott (2002), and Ang (2007) find contradicting results that saving has strong implication on domestic investment. Following the work of Solow (1956) and subsequently confirmed by several studies such as Bosworth (1993), Alguacil et al. (2004), and Romm (2005) that saving has a strong connection with economic growth, this could be one channel through which GDP will affect domestic investment.

Financial Development vs. Domestic Investment

While the debate on the comparative merits between bank-based financial development and stock-market based financial development in mobilising resources and eventually promoting high economic growth is going on (Levine, 2002; Ndikumana, 2005), each sectoral development is crucial to economic development by enhancing domestic investment.[7] Theoretically, bank-based financial system can function as financial intermediary to allow entrepreneurs to invest more domestically. Banks offer financial assistance to alleviate financial constraints, particularly if firms are facing growth with growing demand. Business expansion may likely be possible via additional funding from banks, alongside own capital (Ndikumana, 2005). Ndikumana (2005) outlines several reasons of the benefits of banking system. First, lower cost of borrowing as financial intermediaries can exploit economies of scale, given huge collection of funds from depositors. Second, liquidity risk of investment can be minimised, if not fully avoided. Bank will do the long-term investment on behalf of depositors with the option to be able to withdraw in the short period. Third, banks can closely monitor the prospective investment against the low return risky investment easily, and later will focus more on assisting the promising investments or firms. By doing so, it is expected that firms' performance can be enhanced and more re-investment will be done by the firms. Hence, domestic investment will grow.[8]

On the empirical evidence, Ndikumana (2000) finds that financial development is crucial to domestic investment in sub-Saharan Africa. This finding is robust based on several indicators such as credit to the private sector, total liquid liabilities, credit provided by banks, and an index combining all three. In other words, financial development helps in future domestic investment via facilitating the allocation of financial resources towards the most promising domestic investment activities. Dutta and Roy (2009) present the analysis, in which the findings suggest that financial development has huge potential to boost domestic investment, provided it is supported by well-functioning financial system.[9] Since low cost of acquiring information and doing transaction have been the primary target of investors, the emergence of sound financial market certainly demanded by the investors. In other words, growing domestic investment will concurrently request various financial facilities such as hedging, diversifying, risk pooling, and many other facilities. Hence, further development of financial system may also provide incentives for more domestic investment.

IFDI vs. Domestic Investment

As capital is one of the important elements in growth theories, either classical or neoclassical, inflows of foreign investment such as FDI will then be contributing to the accumulation of capital necessary to support economic growth. However, several past studies have argued that the role of foreign capital could be reversed. For instance, London and Robinson (1989), Boswell and Dixon (1990), and Wimberley (1991) document the case that economic dependency (often refers to heavy reliance on foreign investment) may adversely affect economic growth of the country. Firebaugh (1992) outlines five reasons for this. First, with the ability to avoid tax via transfer pricing, MNCs will contribute less to host government revenue. Second, given the huge gap in capability between MNCs and local firms, the development of indigenous or local entrepreneurship might be crashed out as stiff competition may put local entrepreneurs' survival in stake. Third, although local firms are expected to gain from technology transfer, MNCs normally will only bring its outdated technology to host country. In other words, MNCs may only bring inappropriate capital-intensive technology and therefore, minimise the level of benefits that host country supposed to obtain. Fourth, MNCs also are less likely to reinvest their profit in host country. Firm expansion might be done via local credit, rather than profit reinvestment. Finally, domestic firms are more likely to have strong linkage with other domestic firms, rather than with MNCs. The second issue is the main focus of this study, in which IFDI is crowding out or in domestic investment.[10]

Mišun and Tomšk (2002), who study similar issue in transition economies (or Central and Eastern European economies) observe both crowd-in and crowd-out effect of FDI on domestic investment. There is evidence of crowding-out effect for the period of 1990 and 2000 in Poland, while in the Czech Republic and Hungary, crowding-in effect is observed for the period between 1993–2000 and 1990–2000, respectively. According to Mišun and Tomšk (2002), FDI that offers new goods and services will generally create positive effect on domestic capital formation. Interestingly, the effect of FDI will also be significantly larger if the distribution of FDI is extremely different from the distribution of existing (mainly local firms') capital stock.[11] Conversely, if the MNCs are venturing into the areas where local firms are also focusing at, then increasing competition may crowd-out local firms from the business areas due to less competitive than MNCs. In other word, if FDI is also distributed at the similar locations or sectors, then, the crowd-out effect can be expected.

Empirically, the recent study by Jude (2019) in the case of 10 Central and Eastern European countries demonstrates that crowding-out effect is only a short-run phenomenon explained by creative destruction framework. IFDI tends to crowd-in more investment in the long run with greenfield being the primary channel through which FDI promotes more domestic investment. Prior to Jude (2019), Pilbeam and Oboleviciute (2012) also find similar finding that in the 26 new European Union (EU) members, FDI does not exert crowding-out effect on domestic investment. However, the crowding-out phenomenon occurs in the older 14 EU members for the period 1990–2008. Mutenyo and Asmah (2010) find a reverse sign of crowding-out effect of FDI on domestic investment in 34 sub-Saharan African countries over the period 1990–2003. Apergis et al. (2006) find a crowding-in effect in the less advanced countries in Asia and Africa. In the case of more developed countries, namely the United States and European countries, crowding-out effect is dominating. In a more similar fashion, Mileva (2008) demonstrates that crowding-in effect or positive spill-over effect can be seen in the transition economies of the new EU members.

On the reverse causality, domestic investment may also mean government has successfully created a good business environment, which not only conducive for domestic firms but also to MNCs. High domestic investment also indicates that the host country is well prepared with supporting firms that may be needed to be part of the supply networking. Hence, country with impressive inflows of FDI may also be successful in creating more domestic investment in the host country.

OFDI vs. Domestic Investment

Steven and Lipsey (1992) highlight two channels which OFDI may affect domestic investment. First, via the shift or transfer of domestic saving to foreign market. With limited private-domestic saving, firms facing financial constraint might not be getting the financial liquidity needed from financial institution. Scarcity of financial resources will make it harder to get financial assistance from the domestic financial markets. In the nutshell, OFDI may dampen domestic investment by diverting domestic resources to overseas project. This is particularly exerting much stronger effect if: (1) the expansion abroad is fully financed by using firms' internal resources, and (2) the partial of annual profits is not retuned to or reinvested at home countries for domestic expansion. Second, depending on the motive of moving firms' production line abroad, OFDI may exert an effect on domestic investment. The first motive of efficiency-seeking may not lead to reduction in domestic investment. This strategy which refers to relocation of certain production line abroad, referring to Hejazi and Pauly (2003), may not be affecting domestic investment negatively, or at least neutral. Rather, it may promote rate of domestic investment given by more MNCs' exports of capital and intermediate goods to host countries. The second motive of OFDI, which is market-seeking orientation may have similar effect to efficiency-seeking motivation. The effect could be neutral if displacement of production facilities to overseas does not involve full movement of the production from home country. If at home country export production of finished goods is still going on, then domestic investment will remain. However, even if the shift of production facilities is in full size, if the new demands for intermediate inputs from parent company or other domestic firm continue, then the result of crowd-in or crowd-out effect is ambiguous. Finally, in the case of strategic asset-seeking OFDI, this type of OFDI is expected to bring in a positive effect as the new knowledge might be sent back to home country. Parent company can then apply the new techniques to upgrade its productivity and product uniqueness.

On the empirical side, Feldstein (1995) examines the OFDI from the Organisation for Economic Co-operation and Development (OECD) countries in 1970s and 1980s and observes that OFDI has crowded out domestic investment. Similar findings found by Sauramo (2008) for Finland and Herzer and Schrooten (2007) for Germany. On the other side, Desai et al. (2005) observe that there is no evidence to suggest that outward FDI from the United States exerts negative effect on domestic investment. Among the crucial explanations for this is that the combination of production within and outside the United States has helped the United States MNCs to enjoy lower cost of production. At every level of production, profit is materialised and therefore, domestic as well as abroad investment are growing simultaneously. On the reverse causality, stronger domestic investment may mean

high competition for capturing domestic market. Hence, pushing some firms to move overseas to capture new market niche, particularly in the countries that can offer new advantages such as cheap labour and other resources. Alternatively, it may also mean domestic firm has grown stronger and capable to compete at global level. In summary, there could be a bidirectional causality between OFDI and domestic investment.

METHODOLOGY

Following the work of Fry (1988), the accelerator model assumes that the desired capital stock (K^*) is proportional to real output y:

$$K^* = \alpha y \tag{1}$$

Equation 1 can be expressed in terms of desired ratio of net investment to output $(I/Y)^*$:

$$(I/Y)^* = \alpha\gamma \tag{2}$$

where γ denotes the growth rate of output. The partial adjustment mechanism specified for the investment ratio is to allow the actual investment to adjust partially in any one period to the difference between the desired investment ratio and the investment ratio in the previous period:

$$(I/Y) = \lambda[(I/Y)^* - (I/Y)_{t-1}] \tag{3}$$

or

$$I/Y = \lambda(I/Y)^* + (1-\lambda)(I/Y)_{t-1} \tag{4}$$

where λ is the coefficient of adjustment. The flexible accelerator model allows economic conditions to influence the adjustment coefficient λ. Specifically,

$$\lambda = \beta_0 + \left[\frac{\beta_1 z_1 + \beta_2 z_2 + \beta_3 z_3 + ...}{(I/Y)^* - (I/Y)_{t-1}}\right] \tag{5}$$

where Z_i are all the variables (which include also, if exist, the intercept term for the depreciation rate) that affect λ, and the βs are the coefficients of each variable Z_i. Having established the basic model for domestic investment, the final models after combining the literature of past studies can be expressed as:

$$DINV_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 DFD_t + \alpha_3 IFDI_t + \alpha_4 OFDI_t + \varepsilon_t \tag{6}$$

where *DINV* stands for domestic investment, *DFD* represents domestic financial development, *IFDI* denotes inflows of FDI into Indonesia and *OFDI* represents outward of FDI from Indonesia. *DINV* is represented by domestic gross fixed capital investment as percentage of GDP, GDP is proxied by log of real GDP, *DFD* is represented by domestic credit to private sector as percentage of GDP,[12] *IFDI* is proxied by net inflows of FDI as percentage of GDP, and *OFDI* is proxied by outward of FDI from Indonesia as percentage of GDP. All data are collected from World Development Indicators (World Bank, 2019) with the exception for OFDI, which is gathered from UNCTADstat (UNCTAD, 2019). This study utilises data spanning from 1980 to 2018.

Estimation Procedure: VECM

Although the main objective of this study is to examine the implication of OFDI on economic growth of Indonesia, we are also interested to know the dynamic relationship between the two. Therefore, Granger causality test by Granger (1988), which is based on vector autoregression (VAR) will be applied. Nevertheless, for a time series analysis, to avoid spurious regression, the choice of VAR depends on the stationary condition of each variable. In the event that each variable is found to be non-stationary at level, vector error correction model (VECM) is preferred than the VAR model.[13] VAR model could be considered mis-specified in the presence of variable(s) needs to be first difference, while to take first difference and run the equation in difference equation result in the loss of long-run information, which contained in equation at level. VECM is then considered the most preferred approach as it can incorporate short-run dynamic with long-run equilibrium (Kim, 1998). Therefore, the first test that we need to perform is unit root or stationarity test. Two most common tests, namely the Phillips-Perron (PP) (Phillips & Perron, 1988) and augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1981) will be employed to confirm the existence of unit root problem. The ADF test is based on $\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha_2 Y_{t-1} + \sum_{i=1}^{\rho} \beta_i \Delta Y_{t-1} + \varepsilon_t$, where the null hypothesis refers to *H0:* $\alpha_2 = 0$ against the alternative hypothesis of *Ha:* $\alpha_2 \neq 0$. Phillips and Perron's test statistics can be viewed as Dickey-Fuller statistics that have been made robust to serial correlation by using the Newey and West (1987) heteroskedasticity- and autocorrelation-consistent covariance matrix estimator. One important step is to choose the optimum lag length. To assist us, we opt for the Schwarz Bayesian Criterion (SBC) (Schwartz, 1978).

Table 1
Unit root tests

	PP test				ADF test			
	Level		1st difference		Level		1st difference	
	C	C & T	C	C & T	C	C & T	C	C & T
DINV	–1.500	–1.705	–4.435***	–4.372***	–1.715	–1.938	–4.424***	–4.360***
lnGDP	0.164	–1.953	–4.656***	–4.636***	0.165	–2.272	–4.662***	–4.640***
DFD	–1.869	–1.212	–9.057***	–9.632***	–1.869	–2.196	–5.936***	–5.860***
IFDI	–2.060	–1.805	–4.363***	–4.341***	–2.383	–2.296	–4.433***	–4.416***
OFDI	–2.913	–2.899	–9.256***	–9.532***	–2.89	–2.890	–9.087***	–9.005***

Note: C refers to constant without trend and C & T denotes constant with trend; DINV refers to domestic investment; *** denotes significant at 1%; lnGDP refers to log of real GDP; DFD denotes domestic financial development; IFDI stands for inward FDI and OFDI represents outward FDI

From Table 1, all variables are not stationary at level, but turn to be stationary after first difference. Hence, we can conclude that all variables are integrated at order of 1, or *I(1)*. Given the non-stationary nature of all variables, standard estimation procedure of ordinary least square will offer bias in the results. As the alternative, error correction model has been developed and introduced. As stated by Engel and Granger (1987) that if two (or more) variables are individually integrated of order one, and they are collectively cointegrated, then a causal relationship between (among) the variables could exist at least in one direction. To test for the existence of cointegration, we utilise two tests, namely the trace statistics and the maximum eigenvalue statistics (Johansen & Juselius, 1990). Both tests can be expressed as follows:

$$\lambda_{trace} = -T\sum_{i=r+1}^{n}\log(1-\hat{\lambda}_1) \tag{7}$$

where $\lambda_{r+1}, \ldots, \lambda_p$ are the $p - r$ smallest squared canonical correlation.

$$\lambda_{\max} = -T\log(1-\hat{\lambda}_{r+1}) \tag{8}$$

where λ_{r+1} refers to the $(r+t)^{th}$ largest squared canonical correlation.

Table 2
Lag length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
1	–615.278	NA	4.83e+09	36.486	36.711	36.563
2	–431.673	302.408	436488.2	27.157	28.504*	27.616
3	–400.935	41.586*	344852.2	26.819	29.288	27.661
4	–380.501	21.636	597958.6	27.088	30.679	28.313
5	–279.505	30.426	225623.6*	24.088*	29.924	26.078*

Note: LogL is log likelihood; LR stands for sequential modified LR test statistic (each test at 5% level); FPE is final prediction error; AIC denotes Akaike information criterion; SC is Schwarz information criterion; HQ represents Hannan-Quinn information criterion; * denotes the suggested lag length by each criterion

Prior to the tests, we need to choose the optimal lag length for the VECM. Table 2 tabulates the results suggested by several tests. Similar to unit root test, for VECM, we also rely on Schwarz criterion as the test has tendency to suggest shorter lag and suitable to out short sample. As shown in Table 3, both tests suggest that all variables are cointegrated at order of 1 at 5% critical value. In other words, there is one co-integrating relationship among the variable and therefore, the variables are said as having co-movement in the long run.

Table 3
Cointegration test

H0	λ_{trace}	5% Critical value	*p*-value
r = 0	74.8482	69.8188	0.0187**
r ≤ 1	47.8118	47.8561	0.1505
r ≤ 2	26.4674	29.7970	0.1153
r ≤ 3	8.4685	15.4947	0.4167
r ≤ 4	3.0802	3.8414	0.0792
	λ_{max}		
r = 0	38.0364	33.8768	0.0414**
r = 1	21.3443	27.5843	0.2560
r = 2	17.9989	21.1316	0.1299
r = 3	5.3882	14.2646	0.6922
r = 4	3.0802	3.8414	0.0792

Note: λ_{max} refers to maximum eigenvalue; ** denotes significant at 5%

Once we have confirmed that there is a co-integration among the variables, we can now examine the long-run relationship, which is embedded in the error correction model (ECM). In ECM form, Equation 9 can be expressed as:

$$\Delta DINV_t = \varphi_0 + \sum_{i=1}^{n} \varphi_{1i} \Delta \ln GDP_{t-1} + \sum_{i=1}^{n} \varphi_{2i} \Delta DFD_{t-i} + \sum_{i-1}^{n} \varphi_{3i} \Delta IFDI_{t-1} + \sum_{i=1}^{n} \varphi_{5i} \Delta OFDI_{t-1} + \varphi_6 ECT_{t-1} + \zeta_t \quad (9)$$

where *ECT* stands for error correction term, *n* is the maximum lag length, and Δ denotes for first difference. GDP enters in natural log form, but no notation is added to conserve space. If long-run relationship exists, then *ECT* should be significant with negative sign. To form vector, the other equations can be expressed as:

$$\begin{aligned}
\Delta \ln GDP_t &= \gamma_0 + \sum_{i=1}^{n} \gamma_{1i} \Delta \ln GDP_{t-1} + \sum_{i=1}^{n} \gamma_{2i} \Delta DFD_{t-i} + \sum_{i=1}^{n} \gamma_{3i} \Delta IFDI_{t-i} + \sum_{i=1}^{n} \gamma_{4i} \Delta OFDI_{t-i} + \gamma_6 ECT_{t-1} + \zeta_t \\
\Delta DFD_t &= \theta_0 + \sum_{i=1}^{n} \theta_{1i} \Delta \ln GDP_{t-1} + \sum_{i=1}^{n} \theta_{2i} \Delta DFD_{t-i} + \sum_{i=1}^{n} \theta_{3i} \Delta IFDI_{t-i} + \sum_{i=1}^{n} \theta_{4i} \Delta OFDI_{t-i} + \theta_6 ECT_{t-1} + \zeta_t \\
\Delta IFDI_t &= \delta_0 + \sum_{i=1}^{n} \delta_{1i} \Delta \ln GDP_{t-1} + \sum_{i=1}^{n} \delta_{2i} \Delta DFD_{t-i} + \sum_{i=1}^{n} \delta_{3i} \Delta IFDI_{t-i} + \sum_{i=1}^{n} \delta_{4i} \Delta OFDI_{t-i} + \delta_6 ECT_{t-1} + \zeta_t \\
\Delta OFDI_t &= \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta \ln GDP_{t-1} + \sum_{i=1}^{n} \phi_{2i} \Delta DFD_{t-i} + \sum_{i=1}^{n} \phi_{3i} \Delta IFDI_{t-i} + \sum_{i=1}^{n} \phi_{4i} \Delta OFDI_{t-i} + \phi_6 ECT_{t-1} + \zeta_t
\end{aligned} \quad (10)$$

Finally, as argued by Engel and Granger (1987), if individually two variables are integrated at order of one, and they are also co-integrated collectively, then, there may be a causal relationship, at least in one direction. Granger causality will be conducted to check the dynamic relationship among the variables. To complement causality test, this study will also show the results of impulse response function (IRF).

RESULTS

We begin the discussion on results by summarising the statistics of each variable as shown in Table 4. The low standard deviation for GDP and OFDI may suggest that there is limited growth in both variables. The slow growth of OFDI could be desirable in Indonesia, given the limited domestic capital but for GDP, it could be completely undesirable considering that Indonesia was an "Asian Tiger" alongside Malaysia and Thailand under second tier newly industrialising countries prior to the 1997 Asian economic crisis. What also surprising is the low standard deviation for IFDI into Indonesia, which means that Indonesia is unlikely to be very successful in attracting FDI over time. With relatively similar information between IFDI into and OFDI from Indonesia with slightly higher for IFDI, we are unsure if Indonesia can tolerate any outflow of capital. As the most badly affected country by the 1997 economic crisis, which followed by significant drop in FDI inflows and drop in domestic investment due to low firms' performance, it is evident that Indonesia is still heavily reliant on FDI inflows and sustained increment in domestic investment for its economic development.

Table 4
Descriptive analysis

	Mean	Median	Max	Min	SD	Obs
DINV	26.633	26.992	32.812	19.429	4.377	39
lnGDP	26.852	26.876	27.768	25.925	0.536	39
DFD	32.412	27.658	60.849	9.680	13.692	39
IFDI	0.881	0.849	2.739	–2.583	1.149	39
OFDI	0.370	0.260	1.587	–1.310	0.504	39

Note: SD stands for standard deviation; Obs refers to observation; all variables are as percentage of GDP, except for lnGDP

From the simple correlation as shown in Table 5, we can observe that all factors are generally contributing positively to domestic investment (DINV), with GDP has the highest possible contribution to improvement in domestic investment. It is easily understood by the fact that GDP is also representing firms' production growth, which later reinvested. Positive correlation between OFDI and IFDI is also expected. However, what not known is the reasoning behind this positive co-movement. It can be in the negative perspective that FDI inflows crowd out local firms to search for new business location abroad. It can be due to positive integration of the two in the sense that FDI inflows help strengthening domestic firms, to the extent that they are able to invest abroad. Overall, there is no high correlation among the variables, implying that there is no serious issue of multicollinearity in the model.

Table 5
Correlation analysis

	DINV	lnGDP	DFD	IFDI	OFDI
DINV	1.000				
lnGDP	0.610	1.000			
DFD	0.570	0.190	1.000		
IFDI	0.600	0.320	–0.040	1.000	
OFDI	0.000	0.340	0.110	0.040	1.000

Having confirmed that all variables are stationary at first difference (see Table 1) and all variables are co-integrated at order 1 (see Table 3), Table 6 highlights the results of the long-run and short-run equations. Focusing on the short-run regression results, the error correction term (ECT) has been found to be significant at 10% and negative. ECT confirms the existence of long-run relationship among the variables, complementing the co-integration results. Prior to ECT, the overall model of error correction also passed all diagnostic tests, namely serial correlation, heteroscedasticity, and stability. The model, which embeds the long-run equation is therefore considered as reliable. Regarding the significantly positive role of GDP is obvious; higher GDP means more profit or income, which later will be reinvested or deposited and ready for prospective investments. Conversely, higher GDP also indicates better economic opportunities to be tap by investors, either local or foreign. Impressive GDP may function as a hint and indicate profitability level that can attract more investment in the future. Very often at the back of desirable GDP, conducive support system such as good governance and infrastructure is also well installed (Kolstad and Villanger, 2004).

Table 6
Long-run and short-run equations

DINV = 8.0670lnGDP + 0.1505DFD – 1.2171IFDI – 0.7625OFDI – 30.1193
[1.9356]* [2.5709]*** [–1.0128] [–5.9406]***

The corresponding error correction model:

$\Delta DINV = -0.158ECT(-1)^{*} + 0.0511\Delta DINV(-1)^{**} - 0.0336\Delta DINV(-2) + 9.0445\Delta lnGDP(-1) + 9.2559\Delta lnGDP(-2)^{*} - 0.1623\Delta DFD(-1)^{**} - 0.0194\Delta DFD(-2) - 0.0446\Delta IFDI(-1) - 0.0019\Delta IFDI(-2) + 1.0327\Delta OFDI(-1)^{*} + 0.9208\Delta OFDI(-2) - 0.9525$

Adjusted-R^2	0.558	Heteroscedasticity	0.364
Serial correlation	0.618	Stability	0.178

Note: *, **, and *** denote significant at 10%, 5%, and 1% critical values, respectively; figures in [ ] stand for *t*-statistics; LM test is used to check serial correlation; ARCH test is applied to confirm the heteroscedasticity problem; Ramsey reset test is applied to check the model stability; the figures for serial correlation, heteroscedasticity, and stability refer to *p*-value

The effect of domestic financial development on domestic investment is also significantly positive, in line with several other studies such as Ndikumana (2000) and Dutta and Roy (2009).

This can be explained by the fact that banks can enhance domestic investment in various ways. First, by pooling savings, banks can rise size of funds available for investment. By exploiting economies of scale in information gathering and processing, financial intermediaries can optimise the collection costs of savings from various types of saving units (Ndikumana, 2005). Second, banks can help reducing liquidity risk and subsequently, enhancing domestic investment (Diamond & Dybvig, 1983; Bencivenga & Smith, 1991; Ndikumana, 2005). One crucial attribute of investment is regarding its large capital commitment over relatively long period. Without bank services, individual may suffer serious issue on firm's liquidity in their asset portfolios and has to weigh serious the intention to undertake any form of investment due to lack of capital. Third, given its ability to gather huge information about various investments, financial intermediaries play a vital role in lowering the costs of information of prospective investment activities (Diamond, 1984). Banks will then play the role of delegated monitors of investment companies on behalf of the individual investors. A developed financial system, therefore, should encourage more investment and more efficient capital allocation (Ndikumana, 2005). Moreover, with the latest development in Islamic finance, Indonesia has more means to promote domestic investment and expected to increase the level of financial inclusion and financial deepening. This reflected the current trend of Islamic financial services in Indonesia, which encompasses 10 Islamic commercial banks, with 111 branches, 23 Islamic windows with 251 branches across Indonesia, as well as 149 Shariah community finance banks (Abduh & Omar, 2012; Puteh et al., 2018). All in all, the latest progression in overall financial structure of Indonesia, we can expect to see smooth growth of domestic investment.

Surprisingly, the inflows of FDI into Indonesia exert a negative and significant impact on domestic investment. Although it is against the theoretical norm that FDI will strengthen domestic investment, looking at the pattern of FDI inflows shown in Figure 2, it is understood why the result is negative. Uncertainty in FDI inflows and only recently recorded positive or recovery trend could be the explanations. As explained by Lindblad (2015), since the 1997 economic crisis, and despite rich in natural resources and abundant cheap labour supply, Indonesia has not been so successful in attracting FDI. Lipsey and Sjöholm (2011) concur with the statement by Lindblad (2015) that FDI inflows into Indonesia can be considered as outlier within the northeast and southeast Asian region, even in the core area such as manufacturing. Khaliq and Noy (2007) also share another insight

about the issue that FDI into some sectors such as mining and quarrying which has been recorded as negative contribution. Although FDI in some other sectors shows a positive effect, certainly the positive effect has been fully offset by the negative contribution, leaving a minimum role of FDI in Indonesia. Similarly, we can use similar argument that the negative effect of FDI could probably reduce the domestic investment in Indonesian mining and quarrying sectors, lowering the potential huge domestic investment creation by FDI inflows.

Finally, on the effect of OFDI, the negative effect is as expected. Although the third wave of OFDI maintains the typical motivations,[14] namely market-seeking, efficiency-seeking, and assets-seeking, according to Rasiah et al. (2010), technology-seeking has been dominating the motive of OFDI during the third wave. Nevertheless, Indonesian OFDI is most likely to be under the second wave, from perspectives of period, motive of outflow as well as the latest attribute of the third wave of OFDI. Surprisingly, if we strictly examine, it is also hard to say that Indonesian transnational corporations (TNCs) are within the second wave although it happens to start in 1980s. This could be due to the non-emergence of any Indonesian TNC to be the giant company todays and capable to compete with other TNCs from other Asian countries such as Hyundai from South Korea and Sime Darby from Malaysia. In other word, with limited expansion can be seen from Indonesian TNCs, they might not be able to follow the conditions mentioned above about how OFDI may not be reducing domestic investment. Hence, the negative result is justified. China has been successfully integrated OFDI with domestic investment and Indonesia should learn from China. According to Gondim et al. (2018), among the key strengths of China's OFDI that bring positive effect on domestic investment are: (1) prioritising on resource-seeking OFDI with primary target to acquire scarce raw materials and energy,[15] (2) continued policy to support OFDI as part of the strategies to integrate China to global economy,[16] and (3) related to item number 2, China has created approximately 130 bilateral investment treaties to protect China's OFDI. Unlike China, one of the reasons that Brazilian OFDI has no effect on domestic investment is that no bilateral investment treaty to safeguard its OFDI.

Table 7
Granger causality[17]

	ΔDINV	ΔlnGDP	ΔDFD	ΔIFDI	ΔOFDI	ECT(–1)
			χ^2-statistic			*t*-statistic
ΔDINV	–	4.021	4.382	2.238	0.285	–0.158[–1.963]*
ΔlnGDP	8.215**	–	1.263	46.289***	10.815***	–0.001 [–1.477]
ΔDFD	4.655*	2.626	–	1.016	2.923	0.186[2.681]***
ΔIFDI	0.374	0.453	1.429	–	4.114	–0.114[–0.179]
ΔOFDI	2.731	0.338	0.942	0.318	–	0.044[2.365]**

Note: *, **, and *** denote significant at 10%, 5%, and 1% critical values, respectively; figures in [ ] stand for *t*-value

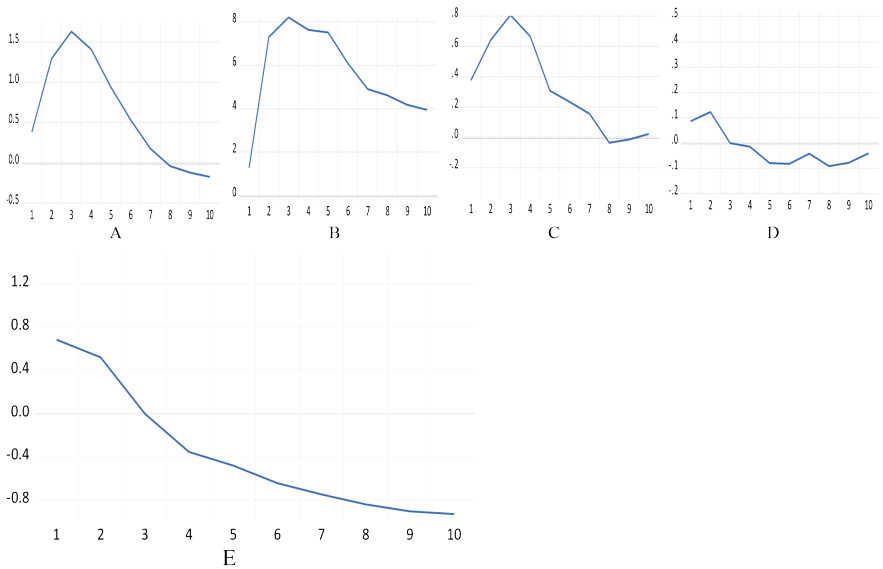

Figure 3. (a) DINV on GDP, (b) DFD on GDP, (c) IFDI on GDP, (d) OFDI on GDP, and (e) OFDI on GDP

With a negative effect of OFDI on domestic investment, in the next analyses, we try to investigate whether OFDI can still positively affect domestic investment if the conditions stipulated in the literature section are met. The conditions are: (1) domestic financial development is sufficiently high enough to compensate for outflow of FDI from Indonesia, (2) inflows of FDI into Indonesia is also significantly high to off-set the outflow of FDI from Indonesia, and (3) OFDI from Indonesia will invite more demand for exports, leading to domestic firms' expansion in respond.

Table 8
Long- and short-run equations with marginal effect analysis [DV: DINV]

	Condition: IFDI[a]	Condition: DFD[b]
lnGDP	8.1944[5.4947]***	7.78806[2.3919]**
DFD	0.3034[6.9727]***	0.5042[2.5732]***
IFDI	4.6833[11.7874]***	1.9712[4.8644]***
OFDI	–2.7625[–6.7881]***	–2.5882[–2.3563]***
OFDI*IFDI	5.8937[9.8763]***	–
OFDI*DFD	–	1.0671[2.7168]***
	Model criterion	
Adjusted-R^2	0.4101	0.3736
Serial correlation	0.235	0.234
Heteroscedasticity	0.641	0.548
Normality	0.214	0.229
	Marginal effect	
At mean	2.4298	–1.6480
At min	–17.9859	–5.3445
At max	13.3803	0.3346
	Error correction model	

[a] ΔDINV = –0.1223ECT(–1)* + 0.1569ΔDINV(–1) – 0.0935ΔDINV(–2) + 26.0881ΔlnGDP(–1)* + 7.1979ΔlnGDP(–2) – 0.0003ΔDFD(–1) – 0.0119ΔDFD(–2) – 1.2019ΔIFDI(–1) – 1.1510ΔIFDI(–2) – 1.2766ΔOFDI(–1) – 0.1816ΔOFDI(–2) + 1.9959Δ(OFDI(–1)*IFDI(–1)) + 1.2203Δ(OFDI(–2)*IFDI(–2)) – 0.7413.

[b] ΔDINV = –0.0452ECT(–1)* + 0.2398ΔDINV(–1) – 0.0550ΔDINV(–2 + 24.6540ΔlnGDP(–1)** + 10.9067ΔlnGDP(–2) – 0.0595ΔDFD(–1) + 0.0510ΔDFD(–2) – 0.0626ΔIFDI(–1) + 0.0950ΔIFDI(–2) + 3.7942ΔOFDI(–1) – 2.6959ΔOFDI(–2) – 0.0882Δ(OFDI(–1)*DFD(–1)) + 0.0678Δ(OFDI(–2)*DFD(–2)) – 0.9277.

Note: *, **, and *** denote significant at 10%, 5%, and 1%, respectively; figure in [ ] stands for *t*-statistic and in ( ) stands for time lag

Unfortunately, while we are interested at the third condition, model specification requires the two more additional variables, namely exports and interaction term between OFDI and exports. The accurate model suffers lower degree of freedom, given limited sample size of this study. Moreover, we have difficult time to identify the appropriate measure of exports to really represent feedback demand due to overseas operation of TNCs. Hence, this issue we leave to future research. With two conditions remain, based on Table 8, this study confirms the significant conditions offered by high inflows of FDI and high development of domestic financial system. IFDI relatively more powerful than DFD as at mean, it can help

OFDI to generate positive effect on domestic investment as shown in marginal effect column. The negative marginal effect when DFD is at mean also highlight the insufficient development of Indonesian financial system to support aggressive economic activities.

CONCLUSION

Indonesia has joined the group of second wave of OFDI from Asian countries. Nevertheless, with the failure of luring similar amount of IFDI after the 1997 Asian economic crisis, OFDI from Indonesia may jeopardise Indonesian economic development by reducing domestic investment. Since no past study deals with this issue, this study could be among the first to investigate the issue. Applying VECM for data spanning from 1980 until 2018, we confirm our intuition that OFDI may dampen domestic investment.

As part of the possible suggestions is for Indonesian government to implicitly as well as explicitly discourage OFDI by giving more incentives, rather than penalties. More incentives and attraction must also be created to ensure that more IFDI will come to Indonesia given the current small number of inflows relative to other neighbouring Asian countries. By doing so, Indonesian government is no longer has to worry about OFDI as sufficiently high IFDI may fully compensate for OFDI to maintain or even spur higher domestic investment. Indonesian government can also think of enhancing the already fast-growing economic segments to be more developed and friendly to the local entrepreneurs so that they can actively involve in doing domestic investment activities.

NOTES

1. FDI can take several forms such as greenfield investment, mergers and acquisitions, and joint venture.
2. The positive effects of FDI on economic development in host countries, either developed or developing countries are through the channels such as the transfer of know-how, the accrual of investment funds, and even the improvement of labour standards (Farla et al., 2016).
3. Domestic investment is not necessarily by local investors only. It is the sum of both, local and foreign investors' investment.
4. We just refer to the volume of inflows, and not really on its connection with GDP. In other word, even though IFDI could be helpful to Indonesian economic growth, its contribution relative to other growth factors' contribution could be at minimum. Continuous reform of institutional quality as well as investment incentives have been among the attraction to MNCs to invest in Indonesia (OECD, 2010). Nevertheless,

Masron (2017), Masron and Naseem (2017), and Masron et al. (2018) argue that improvement in institutional quality is purely a necessary condition but not a sufficient condition to lure MNCs. We suspect the same thing goes to Indonesia.

5. Neverheless, Green (1997) also reminds about the potential over investment due to too many incentives by government. The argument is that current tax policy to re-channel domestic investment to be more into housing has led to over-investment.
6. According to Felstein and Horioka (1980), the reason is that saving in each country is looking for worldwide profitable investment opportunities, while investment in each country is the amount of financing given by pool of capital available worldwide. This is contrary to the general believe that high GDP will bring more saving as in most of the time, people will associate this to the example of Japan.
7. Among countries which are relying highly on bank-based financial system are Germany and Japan. The United States and England are particularly emphasising on stock-market based system (Ndikumana, 2005).
8. Stock-market based system also offers several advantages. First, stock market may induce more investment because it can identify the fundable projects, which can offer good return. Or else, stock market (i.e., stock price) may indicate that the project should not be undertaken. Second, by virtue of risk sharing among the stockholders, stock market can expand its liquidity and decrease the cost of equity capital. Third, stock market signal to the public about the performance of publicly listed firms and therefore, put pressure on firms' top management to perform. High profitability will encourage firms and individual stockholders to put more investment and hence, more domestic investment (Ndikumana, 2005).
9. Xu (2000) and Choong (2012), on the other hand, argue that financial development will promote economic growth through domestic investment channel. Indirectly, these studies conclude that financial development will promote domestic investment, from which economic growth will be stimulated.
10. In addition, Javorcik et al. (2004) stress on the shared ownership as the mean to create win-win outcome. The key argument is that foreign know-how can really be jointly utilised by domestic firms to enhance their efficiency and profitability.
11. This also means that if MNCs can venture into new business area, which is yet to be explored by local firms, then the effect will be multifold.
12. We did try to apply domestic credit by financial services as percentage of GDP, but the results remain the same. We do not report to conserve space but available upon request.
13. Regardless of VAR or VECM, among the benefits of applying them are: (i) all variables are assumed to be endogenous and therefore, prior assumption about causality is not really needed, and (ii) dynamic causality among the variables can be investigated, which can allow for more insight among the relationship.
14. The first wave refers to OFDI with market-seeking and efficiency-seeking motives, mainly driven by TNCs from Latin America from the 1960s until early 1980s. The second wave in the 1980s represented by the previous combined motivations as well as the newly emerged motivation, which is strategic asset seeking motive. The second wave is dominated by Asian TNCs, mainly from South Korea, Hong Kong, and

Taiwan. The third wave originated in 1990s in which large Asian TNCs are competing with TNCs from developed countries.

15. Also, strategic assets in semiconductors and other advanced sectors (Gondim et al., 2018). This is to ensure technological catch-up.
16. You and Solomon (2015) also highlight the importance role by China's government in supporting domestic investment, which later translated into OFDI. In other words, China's OFDI is mostly due to their internal strength.
17. The full set of vector error correction model (VECM) is available in the Appendix.

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APPENDIX

Table A
Error correction model for the rest of the equation

$$\Delta \ln GDP = 0.0081ECT(-1) - 0.1284\Delta DINV(-1)^{**} - 0.0048\Delta DINV(-2) + 0.4506\Delta GDP(-1) - 0.0300\Delta \ln GDP(-2)^{*} + 0.0008\Delta IFDI(-1)^{*} - 0.0006\Delta IFDI\ (-2) + 0.0057\Delta OFDI(-1) + 0.0099\Delta OFDI(-2) - 0.0030\Delta DFD(-1) + 0.0017\Delta DFD(-2) + 0.0198$$

$$\Delta IFDI = 1.7504ECT(-1)^{***} + 0.0968\Delta DINV(-2) + 28.3817\Delta \ln GDP(-1) - 55.3279\Delta \ln GDP(-2) - 0.3865\Delta IFDI(-1) - 0.1579\Delta IFDI(-2) - 1.4185\Delta OFDI(-1)^{***} - 2.7089\Delta OFDI(-2)^{***} + 0.3840\Delta DFD(-1) + 0.1081\Delta DFD(-2) + 0.4415$$

$$\Delta OFDI = 0.1251ECT(-1) - 0.0825\Delta DINV(-2) + 1.8442\Delta \ln GDP(-1) - 3.2656\Delta \ln GDP(-2) - 0.0103\Delta IFDI(-1) - 0.0360\Delta IFDI(-2) - 0.5211\Delta OFDI(-1)^{***} - 0.3738\Delta OFDI(-2)^{***} + 0.0051\Delta DFD(-1) + 0.0303\Delta DFD(-2) + 0.0798$$

$$\Delta DFD = 0.4384ECT(-1)^{**} - 0.2746\Delta DINV(-2) + 6.1968\Delta \ln GDP(-1)^{***} - 5.6263\Delta \ln GDP(-2)^{*} - 0.2829\Delta IFDI(-1) + 0.0100\Delta IFDI(-2) + 0.3722\Delta OFDI(-1) - 0.2125\Delta OFDI(-2) + 0.2955\Delta DFD(-1)^{*} + 0.0305\Delta DFD(-2) - 1.6111$$

Note: *, **, and *** denote significant at 10%, 5%, and 1% critical levels, respectively; figures in ( ) stand for lag