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**Working Paper**

## Does foreign direct investment in financial services induce financial development? Lessons from emerging economies

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## Does foreign direct investment in financial services induce financial development? Lessons from emerging economies

*Jithin Podikkalathil and Suresh Babu Manalaya*

### Abstract

The authors employ panel Vector Error Correction Models (VECM) and cointegration framework to identify the existence and direction of the causal association between foreign direct investment (FDI) in financial services and financial development for 26 emerging economies for the period 2003–2015. Their results show that there exists a long-run cointegrating relationship between financial development and FDI in financial services after incorporating the extent of heterogeneity among emerging economies. The authors find long-run unidirectional causality from financial development to financial services FDI. Using fully modified OLS (FMOLS) estimation, they estimate the long-run elasticities between financial services FDI and financial development. Their results show that financial development has a positive and significant impact on FDI in financial services, which implies that a country with well-developed financial markets tend to attract larger amounts of FDI in financial services.

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## **1. Introduction**

Well-functioning and adequately regulated financial markets are considered as prerequisites for reaping significant gains from foreign direct investments (FDI), which in turn could be channelized to enhance economic growth. The World Economic Forum (2012) defines financial development as “the factors, policies, and institutions that lead to effective financial intermediation and market as well as deep and broad access to capital and financial services” (p.3). Well-developed financial markets of host countries act as a catalyst to exploit the benefits of FDI in several ways. First, an easier access to credit in the host country allow firms to utilise new technologies by investing in new physical and human capital and thereby enhancing capital formation. Second, a highly developed financial sector expedite FDI to provide both backward and forward linkages that are beneficial for domestic suppliers and consumers. This could lead to improved production efficiency and better quality of products. Desbordes and Wei (2017) find that source and destination economies’ financial development jointly boost FDI flows directly and indirectly by enlarging access to external finance and accelerating economic development respectively. A large section of the existing literature finds that financial market development is a crucial determinant of FDI inflows, which act as a catalyst in absorbing FDI spillovers for economic growth (Alfaro et al., 2004; Saini et al., 2014; Moshirian, 2006). These studies demonstrate the three-way association between financial development, FDI and economic growth.

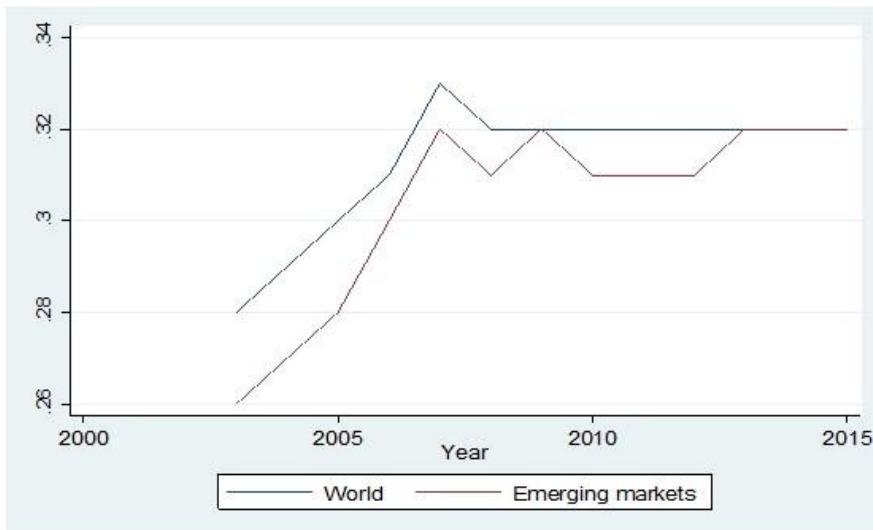
Over the last three decades, emerging economies have undergone a significant transformation in their role as ‘attractors’ of foreign direct investment. A striking phenomenon that has emerged is the increased flow of FDI into the services sector of the emerging economies. Outpouring FDI in services has brought about structural changes in these economies, with implications on output growth, employment generation, export performance and financial development. Emerging economies are the successful in attracting a large quantum of FDI in services especially in financial services. This proliferation of FDI in financial services has also urged the assimilation of emerging economies’ financial market into the global financial system. This in turn leads to considerable benefits to the emerging markets in terms of production efficiencies. Financial services FDI helps to develop the financial conditions of host countries, with a risk of the economy being susceptible to various global financial shocks (Cetorelli and Goldberg, 2011; Goldberg, 2009). Moshirian (2006) finds that the existence of foreign banks in domestic economy including emerging economies enhances transparency,

higher international standards and ultimately financial market efficiency. Simultaneously, he observes that the networks of multinational banks are spreading across the globe mainly into the Latin America, Eastern European countries and to some extent in Asia. FDI in banking services in the world stimulates global financial integration and improves the efficiency of the global banking system.

Given this background, we analyse the implications of financial sector FDI on a set of host countries. We are motivated by the thriving importance of FDI in services especially in financial services and its implications in the emerging economies. The need to analyse the implications of FDI in financial services on economic activity assume significance in the post 2000 scenario as emerging economies are opening up their financial sector and pursuing financial liberalisation. Further, there exists a rationale to believe that the implications of financial services FDI are different from that of aggregate FDI because of the characteristics of financial services. It is also argued that the deregulation policies of financial sector in emerging economies enabling financial institutions to establish their subsidiaries in these host countries are critical in enhancing the efficiency of these host country's financial services sector. This ultimately can pave the way for a viable and steady economic growth through financial development, which is visible in case of emerging economies (Goldberg, 2009). At the same time, lack of financial market development adversely limits an economy's ability to exploit potential benefits of FDI and limits its capacity to cope up with unregulated short-term capital inflows.

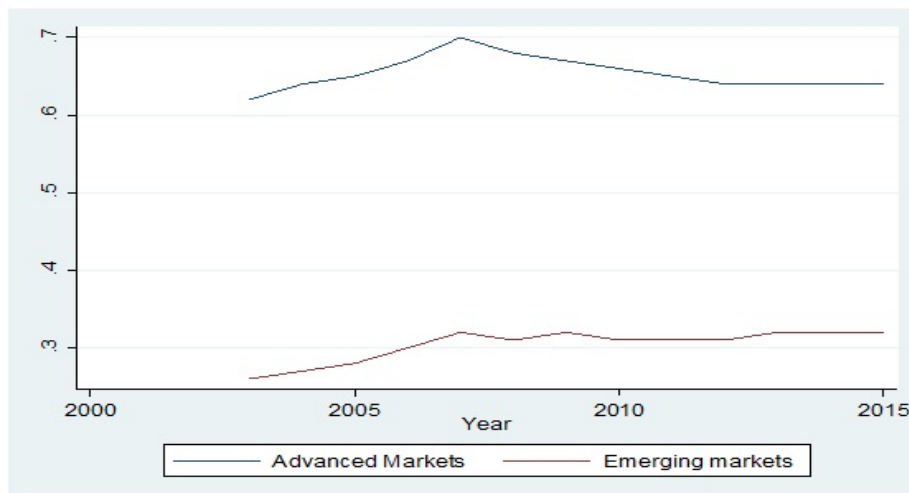
In figure 1, we portray the index of financial development globally and in emerging markets. We observe that the trend of financial development in emerging markets registered secular increase up to 2008 and decreased in 2009. Since 2012, we find that both this indices converge, that is financial development in emerging economies have hit the global level. The global and emerging markets financial development are showing the same pattern except for 2009, 2011 and 2012. This indicates that it is not the advanced markets economies, but the emerging markets economies that have a vital role in deciding the global level of financial development.

Figure 1: Financial development index; global trends



Source: Financial Development Index, IMF

Figure 2: Financial development Index in advanced and emerging markets



Source: Financial Development Index, IMF

As an illustration of recent trends of financial development in advanced markets and emerging markets, Fig. 2 provides a scope of comparative analysis. It shows that the emerging markets are lagging behind the advanced markets in terms of financial development but the gap between two is decreasing over time.

Research on FDI and financial development has generally focused on aggregate FDI and FDI in manufacturing sector (Hermes and Lensik, 2003; Sahin and Ege, 2015; Alfaro et al., 2004; Desbordes and Wei, 2017). Further, there exist a large section of the literature on the impacts of FDI on financial development focused on developed economies. However, the impacts of

financial services FDI on financial development in the context of emerging economies is conspicuously absent. Given this backdrop, this study attempts to address these lacunae. The paper contributes to the existing literature in the following two ways. First, it analyses the impacts of financial services FDI on financial development in the context of emerging economies employing disaggregated sub sectoral data. Second, we use panel VECM approach to understand the two-way linkages between the variables, results of which provides important policy implications for emerging economies.

The paper is organised in six sections. Section 2 deals with some conceptual issues regarding financial services FDI in emerging economies. Section 3 presents a review of existing literature on the relationship between FDI and financial development. Section 4 provides a description of the data followed by a discussion of the methodology used and empirical results in section 5. Section 6 concludes the paper.

## **2. Financial Services FDI in Emerging Economies**

Financial services sector in emerging economies includes various activities such as banking, insurance entities, non-banking financial companies (NBFCs), and capital market related activities such as stock and commodity exchanges, brokers, mutual funds and merchant banks. Last three decades, witnessed an outpouring of FDI in financial sector into the emerging economies. The second half of the 1990s witnessed, the “third wave” of international banks’ activities, which implied that the multinational banks extended their banking activities to emerging economies. Bank for International Settlement statistics shows that total foreign claims doubled as compared to the early 1980s, and it amounted to approximately US \$ 1.4 trillion, which is still only one eighth of the foreign claims among developed countries (Herreno and Simon, 2003).

The expansion of FDI in the financial services has resulted in a renewed interest on its implications on the host economies. Moshirian (1996, 2004) finds that trade in financial services was generated mainly through FDI. Kose et al. (2009) also has a similar finding that FDI is the major contributor of international investment in developing economies, which implies foreign companies are likely to prefer emerging economies for their investments. This, in turn, leads to the inflow of FDI in financial services as a follower of manufacturing FDI. Domenski (2005) find that financial sector FDI inflows to the emerging economies are mainly in terms of mergers and acquisitions. It has shown a rapid increase from \$2.5 billion to \$67.5

billion over a time span of 10 years (1994-1995 to 2004-2005). The FDI inflows in services is mainly determined by the local conditions of the destination economies such as political stability, financial development, infrastructure and market size. Financial deregulation in the global economy as a whole leads to the inflow of financial services to the emerging economies as well. Simultaneously, the increment in the diversification of financial products could be one of the reasons for FDI inflows to emerging economies. Further, economic growth of destination economies is a crucial factor, which determines the extent of financial sector FDI inflows, and it acts as a driving force of international banking (Focarelli and Pozzolo, 2001). They also find that foreign banks prefer to operate in a country, which is relatively less developed and does not possess a concentrated financial system.

### **3. FDI and Financial Development: The Linkages**

Financial development plays a crucial role in determining FDI inflows, particularly in services. It catalyses the positive impacts of FDI on economic development. One set of earlier studies (Hermes and Lensik, 2003; Alfaro et al., 2004; Sahin and Ege, 2015) argue that a well-functioning financial market of destination economies is an essential condition for FDI to have positive impacts on economic growth. However, it should be noted that there exists vast empirical literature, which examines the impacts of FDI on financial development. A stratum of the existing literature which deals with cross-country evidence shows that the results are mostly in tandem with theoretical expectation that FDI promotes financial development or a bidirectional relationship (Shan, 2002; Alfaro et al., 2004; Desbordes and Wei, 2017; Saini et al., 2010). Saini et al. (2010) employ the threshold regression model to estimate the dynamic relationship between economic growth, FDI and financial markets. They find that there exist threshold effects in FDI-financial development-economic growth relationship. The effects of FDI on economic growth changes after the financial development cross the threshold level and upto these the impacts of FDI are absent.

Sahina and Ege (2015) find that there exists bidirectional linkages between financial development and FDI in the case of Turkey and forecast of financial development is highly influenced by FDI. Some of the existing studies (Goldberg, 2009; Cetorelli and Goldberg, 2011) find that financial services FDI can help to improve host countries' financial development in terms of institutional development. The inflow of financial services FDI to the host countries would affect financial development and these economies are more vulnerable to international financial shocks. Desbordes and Wei (2017) find that financial development of

the source and host economies jointly clout FDI through access to foreign finance and indirectly improving economic growth. Chinn and Ito (2006) suggests that higher level of financial openness both directly and indirectly influence the legal and institutional development in emerging markets than in developing economies. They find that trade openness is an initial condition for capital account liberalisation and for equity market, development-banking system is a precondition. Knight (1998) analysed the effects of the globalisation of financial markets on developing and transition economies (DTEs) and finds that competitive banking sectors will act against the adverse economic shocks to protect the economy from the crisis and non-bank financial sector can increase the competitiveness of the banking sector.

The presence of multinational banks, mutual funds and insurance companies (FDI in financial services) in host countries will have some spillover effects on the financial development of the economies concerning efficiency and transparency. Moshirian (2006) emphasize the importance of FDI and trade in financial services, his results show that FDI in financial services brings higher international standards, more transparency and financial market efficiency to the host countries. The advantages due to the presence of multinational banks and insurance companies are more than the costs associated with it. Moshirian (2001) differentiated the FDI in banking and banking activities abroad by banks and non-banks. He finds that the contribution of banks foreign assets is enormous in the expansion of FDI in the banking sector by both bank and non-bank investors. He also finds that the relative economic growth, cost of capital, FDI in non-finance industries, exchange rates, banks' foreign assets and bilateral trade are the main determinants of FDI in banking sector.

Li and Moshirian (2004) find that product differentiation and financial innovations in financial services leads to intra industry trade in financial services among the multinational financial institutions. These developments in the financial services in turn contributes to economic development of the host countries. They also find that deregulation leads to the opening of more branches in the host countries that in turn enhance the efficiencies of financial market. Herreno and Simon (2003) find that the macroeconomic theories of financial services FDI is scarce and still too concentrated on the so called the “wave” of bank international expansion where the client following and information advantage is considered critical. However, theories explaining the “third wave” of bank internationalisation characterised by a surge local operation in emerging economies is non-existent or lacking in the existing literature.



A review of the recent literature points to the following insights. First, the existing literature provides the possibility of two- way linkages between FDI in financial services and financial development along with their long-run and short-run dynamics (Goldberg; 2004). Second, a large strata of the existing literature examine the three-way linkages between FDI, financial development and economic growth, however, the literature analysing the impacts of sectoral FDI on financial development are more or less absent with little or no significant research on the impacts of financial services FDI on financial development of a particular country. Third, examination of the causal links between financial services FDI and financial development, specifically focusing on emerging economies assumes relevance, but is either lacking or non-existent. Hence, our attempt is to fill this gap by analysing the impacts of FDI in financial services on financial development explicitly focusing on the emerging economies.

#### **4. Data Description**

Data for empirical analysis, except the financial development index and FDI inflows were collected from the World Development Indicators (WDI), World Bank. Data on financial development index is sourced from IMF (international monetary fund) and FDI inflows are sourced from the United Nations Conference on Trade and Development (UNCTAD). The unbalanced panel data assembled consists of observations for 26 countries for the period 2003-2015. A list of the selected countries are provided in appendix. The selection of countries and time period have been guided by two considerations; a) the sheer availability of data b) to include a phase of global economy which witnessed both growth and turbulence driven by financial flows. Table1 presents description of variables, corresponding sources of data.

The descriptive statistics shown in Table 2 indicates the heterogeneity between the emerging economies since our variables fluctuate largely from country to country with a wide range.

Table 1: Description of variables

<b>Variables</b>	<b>Measurements</b>	<b>Sources</b>
Financial Services FDI	Log of financial services FDI	United Nations Conference on Trade and Development(UNCTAD)
Financial development index	Financial development index	International Monetary Fund (IMF)
Manufacturing FDI	Log of manufacturing FDI	United Nations Conference on Trade and Development(UNCTAD)
Nonfinancial Services FDI	Log of nonfinancial services FDI	United Nations Conference on Trade and Development(UNCTAD)
Domestic capital	Domestic capital formation as a percentage of GDP	World Development Indicators, World Bank
Openness	The ratio of international trade (export + import) to GDP	World Development Indicators, World Bank

Table 2: Descriptive statistics

<b>Variables</b>	<b>Observation</b>	<b>Mean</b>	<b>Std. deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Financial Development	338	.3691302	.206049	.0617825	.8591687
Financial Services FDI	268	3.48741	.9390167	1.351526	5.468187
Non-financial services FDI	268	3.794765	.9020481	1.14922	5.994482
Manufacturing FDI	269	3.579121	.817591	1.244189	5.038542
Domestic capital	327	22.09684	6.036274	5.458996	43.6198
Openness	327	97.90331	88.8676	21.12435	442.62

## 5. Econometric Methodology and Empirical Results

The estimation techniques such as unit root and cointegration usually used to analyse long-run characteristics of time series, the shorter time span of our panel may limit the efficiency of these estimates. We use Pedroni (1999, 2004) and Kao (1999) cointegration technique to examine the existence and direction of long run relationship between financial services FDI and financial development. The result and discussion is divided into four parts. First, we find that our variables, that is, financial development index, FDI in financial services, non-financial services FDI, FDI in manufacturing, domestic capital formation and trade openness have unit roots. Second, after establishing the variables are stationary, next step is cointegration test and we use Pedroni's heterogeneous panel cointegration and Kao's panel cointegration test. The cointegration test are used to test the long run relationship between two or more time series when individual variables are non-stationary. Since there exists heterogeneity across emerging economies in terms of their financial development, FDI, macroeconomic conditions, and trade, we employ the heterogeneous panel cointegration to incorporate the heterogeneity among the emerging economies. Third, after establishing the long run relationship, we test for two-way linkages between our variables using panel VECM. Finally, the long run coefficients of financial services FDI on financial development and vice versa are estimated using fully modified OLS (FMOLS) estimation.

### 5.1 Panel unit root test

Our analysis start with panel unit root test, which is popular in terms of its weak restrictions in the empirical macroeconomics literature. Panel unit root test are employed on both levels, and first difference for all five variables. There are several methodologies for panel unit root tests, notably Breitung (2001), Levin, Lin and Chu (2002), Im, Pesaran and Shin (2003) which is used to test the stationarity. We utilise Im, Pesaran and Shin (2003), Breitung (2001) panel unit root test statistics in order to examine integration properties of the FDI in financial services, financial development, FDI in non-financial services, domestic capital, Manufacturing FDI and trade openness.

The Breitung (2001) takes the following model to test for stationarity:

$$y_{it} = \alpha_{it} + \sum_{k=1}^{p+1} \beta_{ik} x_{it-k} + \varepsilon_t \quad (1)$$

Null hypothesis and alternative hypothesis of test statistics is given below.

$$H_0: \sum_{k=1}^{p+1} \beta_{ik} x_{it-k} - 1 = 0$$

$$H_1: \sum_{k=1}^{p+1} \beta_{ik} x_{it-k} - 1 < 0$$

Breitung (2001) employs the following transformed vectors to formulate the test statistic.

$$y_i^* = AY_i = [y_{i1}^*, y_{i2}^*, \dots \dots \dots y_{iT}^*]'$$

$$x_i^* = AX_i = [x_{i1}^*, x_{i2}^*, \dots \dots \dots x_{iT}^*]'$$

The transformed vectors used to establish the following test statistic:

$$\gamma_B = \frac{\sum_{i=1}^N \sigma_i^{-2} y_i^* / x_i^*}{\sqrt{\sum_{i=1}^N \sigma_i^{-2} x_i^* / A / AX_i^*}} \quad (2)$$

It follows a standard normal distribution.

Im, Pesaran and Shin (IPS) (2003) employs modified Dickey fuller regression to test the stationarity of the variables. It combines both time series and cross section dimension, so few time series is enough for the test to have power. IPS considered as superior test power to analyse the long run relationship in panel data. The test uses a modified augmented Dickey Fuller regression

$$\Delta y_{it} = \alpha_i y_{it-1} + \sum_{m=1}^{k_i} \beta_{im} \Delta y_{it-m} + \phi_i z_{it} + \varepsilon_{it} \quad (3)$$

Where  $k_i$  is the lag length,  $z_{it}$  is a vector of deterministic terms, explaining the fixed effects or individual trends.  $\phi_i$  is the corresponding vector of coefficients. The hypothesis of the test can be written as

$$H_0: \alpha_i = 0 \quad \text{For all } i$$

$$H_1: \alpha_i < 0 \quad \text{For atleast one } i$$

IPS test the hypotheses with the standardized t-bar statistic

$$\bar{t}_{IPS} = \frac{\sqrt{N} \left[ \frac{1}{N} \sum_{i=1}^N t_i - \frac{1}{N} \sum_{i=1}^N E(t_i / \rho_i = 0) \right]}{\sqrt{\frac{1}{N} \sum_{i=1}^N \text{var}(t_i / \rho_i = 0)}} \Rightarrow N(0,1) \quad (4)$$

If N and T are small then IPS (2003) test have a superiority over other tests since they proposed a cross sectional demeaned version. It is useful in the case time specific component is common in errors in different regressions.

Table 3 shows the unit root results. We find the evidence for the rejection of null hypothesis of stationarity in the levels and in case of first difference; we do not have sufficient information

to reject the null hypothesis, which implies the stationarity at first difference of our selected variables. Based on these test results, therefore it can be concluded that the variables of financial development, FDI, domestic capital and trade openness are I (1) variables.

Table 3: Panel unit root tests

<b>Variables</b>	<b>Breitung test</b>	<b>Im, Pesaran and Shin</b>
<i>Level</i>		
Financial Development	-0.98020	-0.63977
Financial Services FDI	-1.4179	0.27883
Non-financial services FDI	1.64532	-0.10012
Manufacturing FDI	1.32414	-0.57126
Domestic capital	-1.5817	-0.66702
Openness	1.72296	0.13382
<i>First difference</i>		
Financial Development	-4.13251***	-15.7571***
Financial Services FDI	-4.29020***	-3.74549***
Non-financial services FDI	-1.83090**	-1.75035**
Manufacturing FDI	-1.81349**	-2.65748***
Domestic capital	-4.76052***	-4.37284***
Openness	-7.99154***	-7.20513***

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

IPS results shows that the variables are non-stationary in levels at 1% and 5% significance levels. All variables with individual intercepts and trends are found to be stationary at first difference I (1). The results indicates that the satisfying essential conditions for panel cointegration is fulfilled. Based on the above results one can proceed with panel cointegration to analyse the long run relationship between financial services FDI and financial development.

## 5.2 Panel cointegration

If the variables are non-stationary at levels and are integrated of order I (1), then it implies that they might or might not share a long run relationship or are cointegrated in the long run. Therefore, it is necessary to inspect this property among variables. We employ two kinds of panel cointegration tests, Kao (1999) and Pedroni (1999, 2004) to check the robustness of the long run relationship between financial services FDI and financial development and across estimations. We use heterogeneous panel cointegration framework in order to incorporate the heterogeneity across 26 countries in the financial and non-financial services FDI. Pedroni (1999, 2004) assimilate the heterogeneity across cross sections in cointegration methodology. Pedroni (1999) finds that conventional cointegration methods usually “suffer from unacceptably low power” if we are using a restricted length of data. In addition to that, Pedroni cointegration provides both short run dynamics, the fixed effects and the vectors of cointegration changes from one cross section to another. We estimate the long run relationship between our variable using the following equation.

$$y_{it} = \alpha_i + \beta_i X_{it} + \epsilon_{it} \quad (5)$$

Where  $\alpha_i$  ( $i=1,2,3,\dots,25$ ) is country specific effects, and  $\epsilon_{it}$  is the error term which shows the deviations from the long run steady relationship.  $X_{it}$  is an m dimensional column vector for each cross sections i.  $\beta_i$  is a m dimensional row vector for each cross sections i of the panel. If  $\epsilon_{it}$  turns out to be stationary at levels I (0), which implies that there exist a long run relationship between FDI in financial services and financial development.

Pedroni (1999) estimated the residuals using seven statistics to identify whether there exist a long run relationship between the variables.

Pedroni (1999) explained the seven test statistics of panel cointegration, “The first of the simple panel cointegration statistics is a type of non-parametric variance ratio statistics. The second is a panel version of a non-parametric statistics that is analogous to the familiar Phillips Perron rho-statistics. The third statistics is also non-parametric and is analogous to the Phillips and Perron t- Statistics. The fourth statistics is the simple panel cointegration statistics which is corresponding to augmented Dickey-Fuller t -statistics.”(Pedroni, 1999) “The rest of the statistics are based on a group mean approach. The first of these is analogous to the Phillips and Perron rho-statistics and the last two analogous to the Phillips and Perron t-statistics and the augmented Dickey-Fuller t-statistics respectively” (Pedroni, 1999). Table 4a shows the seven test statistics of Pedroni’s panel cointegration in different model specifications. Majority of the test statistics out of seven for different parameters of interest indicates that the rejection

of null hypothesis (no cointegration) at 1% level. Therefore, we can conclude that unit root variables of financial development and FDI in financial services are sharing a long run relationship or cointegration. In another words, FDI in financial services and financial development in emerging economies are positively associated with each other. Thus, we can conclude from the cointegration test result that there exists a co-movement among FDI in financial services, financial development, and domestic capital, manufacturing FDI, FDI in non-financial services and trade openness in the long run.

Table 4a: Pedroni panel cointegration test

Test statistics	Fixed time effects	No time effects
Panel v	-3.967357	-2.744567
Panel rho	3.372275	2.315230
Panel PP	-14.46574***	-14.96333***
Panel ADF	-8.540573***	-11.73927***
Group rho	5.570407	5.178513
Group PP	-20.32070***	-18.13310***
Group ADF	-7.987385***	-9.328530***

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Kao (1999) proposes Augmented Dickey Fuller (ADF) and Dickey Fuller (DF) type unit root tests. The DF type test from Kao takes the following form:

$$y_{it} = \alpha_i + \beta_i X_{it} + \epsilon_{it} \quad (6)$$

Where

$$y_{it} = y_{it-1} + u_{it}$$

$$x_{it} = x_{it-1} + u_{it}$$

The Dickey-Fuller test employed to the estimated residual using

$$\hat{\epsilon}_{it} = \rho \hat{\epsilon}_{it-1} + v_{it}$$

Null and alternative hypothesis of Kao cointegration are as follows;

$$H_0: \rho = 1$$

$$H_1: \rho < 1$$

Table 4b provides the Kao cointegration results. As reported in the table Kao panel cointegration rejects the non-stationarity of  $\epsilon_{it}$  under all specification at 1% level. Thus, we can conclude that FDI in financial services and financial development as I (1) variables are cointegrated in the long run or there exist a long run relationship.

Table 4b: Kao residual cointegration test

Kao Residual cointegration test		
	t-Statistic	Prob.
ADF	-11.40546	0.0000

### 5.3 Panel causality test

As FDI in financial services and financial development are cointegrated, we employ the panel vector error correction models (VECM) to estimate the two-way linkages between the financial development and financial services FDI. Panel VECM using the two-step procedure from Engle and Granger (1987) to account for the long run relationship. In first step, we estimated the model using following equation;

$$FINAND_{it} = \alpha_{it} + \delta_{it}t + \beta_{1i}LFS_{it} + \beta_{2i}LNFS_{it} + \beta_{3i}LMFDI_{it} + \beta_{4i}DCF_{it} + \beta_{5i}OPEN_{it} + \epsilon_{it} \quad (7)$$

We obtained the estimated residual by estimating equation (7).

In second step, we assimilated the random disturbance term  $\epsilon_{it}$  as an explanatory variable; we estimated the dynamic error correction model to provide inferences on causality between the variables. Based on these, the dynamic error correction model of our analysis takes the following form:

$$\Delta FINAND_{it} = \theta_{1j} + \lambda_{1i}\epsilon_{it-1} + \sum_K \theta_{11ik}\Delta FINAND_{it-k} + \sum_K \theta_{12ik}\Delta LFS_{it-k} + \sum_K \theta_{13ik}\Delta LNFS_{it-k} + \sum_K \theta_{14ik}\Delta LMFDI_{it-k} + \sum_K \theta_{15ik}\Delta DCF_{it-k} + \sum_K \theta_{16ik}\Delta OPEN_{it-k} + u_{1it} \quad (8)$$

$$\Delta LFS_{it} = \theta_{2j} + \lambda_{2i}\epsilon_{it-1} + \sum_K \theta_{21ik}\Delta LFS_{it-k} + \sum_K \theta_{22ik}\Delta FINAND_{it-k} + \sum_K \theta_{23ik}\Delta LNFS_{it-k} + \sum_K \theta_{24ik}\Delta LMFDI_{it-k} + \sum_K \theta_{25ik}\Delta DCF_{it-k} + \sum_K \theta_{26ik}\Delta OPEN_{it-k} + u_{2it} \quad (9)$$



Where  $\Delta$ ,  $k$  denotes the first difference and lag length respectively.

Granger causality can be identified if the dependent variables are significant in Eqs. (8) (9) so the parameters of our interest in the error correction model as follows;

$\lambda_{1i}$ : Long run effects of innovations in FDI in financial services on financial development.

$\lambda_{2i}$ : Long run effects of innovations in financial development on FDI in financial services.

$\theta_{12ik}$ : Short run granger causality from FDI in financial services to financial development.

$\theta_{22ik}$ : Short run granger causality from financial development to FDI in financial services.

If the source of causation  $\varepsilon_{it-1}$  in eqs. (8) and (9) is significant in the model, and then we can infer that there exist a long run causality.  $\lambda$  is the coefficient of error correction term and it is also called speed of adjustment, which indicates the speed of fluctuations from long run equilibrium are cancel out following changes in each variable (Mehrara, 2007). We tested the following hypothesis to find out the long run causality

LFS to FINAND  $H_0: \lambda_{1i} = 0$  for all in Eqs (8)

$H_1: \lambda_{1i} \neq 0$  for at least 1 i

FINAND to LFS  $H_0: \lambda_{2i} = 0$  for all in Eqs. (9)

$H_1: \lambda_{2i} \neq 0$  for at least 1 i

We formulate the hypothesis for short run causality, which takes the following form:

LFS to FINAND  $H_0: \theta_{12iK} = 0$  for all  $i, k$

$H_1: \theta_{12iK} \neq 0$  for at least 1  $i, k$

FINAND to LFS  $H_0: \theta_{22iK} = 0$  for all  $i, k$

$H_1: \theta_{22iK} \neq 0$  for at least 1  $i, k$

Table 5: Results of panel causality test

Null hypothesis	Long run	Short run
H <sub>0</sub> : FDI in financial services does not granger cause financial development	-0.01876	1.5649
H <sub>0</sub> : Financial development does not granger cause FDI in financial services	-2.3337**	0.77823

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

As it is clear from Table 5, there exists only unidirectional causality between financial development and financial services FDI. We find that FDI in financial services does not Granger cause financial development in both the short run and in the long run since coefficient of error correction term and FDI in financial services are not significant. However, in FDI in financial services equation, error correction term is significant which implies the existence of long run causality running from financial development to financial services FDI.

#### 5.4 Fully modified OLS

Our fourth and final step is to employ fully modified OLS to estimate the long run elasticities of the model. Based on Pedroni (2001), we also employ the FMOLS to estimate the heterogeneous cointegrated panel. The superiority of FMOLS over OLS is that FMOLS take into consideration the issue of serial correlation and endogeneity in the estimation, which may dominate the super consistency of OLS estimate. Pedroni (2001) explained the superiority of FMOLS is that it can used to find an inference about heterogeneous panel cointegration. It also used to address the endogeneity problem and provide estimates of the coefficient that are unbiased. These coefficients can be described as the long run elasticities of the variables. FMOLS results are shown in table 6.

We estimated FMOLS for two models using financial development and FDI in financial services as left hand side variables and estimated these models to obtain the long run relationship of financial development concerning FDI in financial services and the long run relationship of financial services FDI concerning financial development. In case of financial development, all the independent variables except FDI in financial services and domestic capital were significant at the 1% level. The coefficient for FDI in non-financial services is positive and significant which means that increased shares of FDI in nonfinancial services in

total FDI leads to financial development in emerging economies. Our results show the adverse effect of changes in the direction of FDI flows in favour of manufacturing on financial development. In addition to this, trade openness has a positive and significant impact on financial development in emerging economies. We also find an adverse insignificant effect of domestic capital formation on financial development.

When FDI in financial services was considered as a dependent variable, all variables except domestic capital formation and trade openness were significant at 1% level. The coefficient of financial development is positive which implies that well developed financial market attracts a large amount of FDI in financial services. We find a positive and significant effect of FDI in nonfinancial services on financial services FDI. Our results shows a positive and significant effect of FDI in manufacturing on financial services FDI that suggests that the intersectoral linkages of manufacturing FDI.

Table 6: fully modified OLS estimates

VARIABLES	(1) FINAND	(2) LFS
Financial Services FDI	0.0417	
Non-Financial Services FDI	0.0989***	0.4151***
Manufacturing FDI	-0.0663**	0.3445***
Domestic Capital	-0.0009	-0.008
Openness	0.001**	-0.001
Financial Development		1.7345***

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## **6. Concluding Remarks**

Even though there exists vast empirical literature on the positive impacts of FDI on financial development of an economy, the literature on the two-way relationship between FDI, especially FDI in financial services and financial development is limited. Our aim is to provide an empirical investigation of the existence and direction of the causal relationship between FDI in financial services and financial development in the context of emerging economies. Using data for 26 major emerging economies and applying a panel VECM, we establish a unidirectional long-run causality running from financial development to FDI in financial services for the period 2003-2015. This unidirectional causality implies that FDI in financial services is mainly determined by the financial development of the economies.

The paper provides the evidence of a long run steady state relationship between FDI in financial services and financial development for emerging economies after allowing for country specific variations. When financial development was considered, we find that all the independent variables except FDI in financial services and domestic capital were significant and increased shares of FDI in nonfinancial services in total FDI leads to financial development in emerging economies. However, in the model of FDI in financial services, all variables except domestic capital and trade openness were significant. Financial development has a positive and significant impact on FDI in financial services. It implies that a well-developed financial market, in turn, attracts a large amount of FDI in financial services. The presence of unidirectional relationship coupled with a positive and significant impact of financial development on FDI in financial services implicitly recommends that the emerging economies have to emphasise on policies to develop local financial markets to attract more FDI in financial services. It emerges from our analysis that policies for financial development need to be prioritised and implemented in emerging economies. However, such policies pose challenge as their design needs explicit recognition of an increase in the depth and breadth of the domestic financial markets.

## References

- Alfaro, Laura, Areendam Chanda, Sebnem Kalemli-Ozcan, and Selin Sayek. "FDI and economic growth: the role of local financial markets." *Journal of International Economics* 64, no. 1 (2004): 89-112.
- Azman-Saini, W. N. W., Siong Hook Law, and Abd Halim Ahmad. "FDI and economic growth: New evidence on the role of financial markets." *Economics Letters* 107, no. 2 (2010): 211-213.
- Breitung, Jörg. "The local power of some unit root tests for panel data." In *Nonstationary panels, panel cointegration, and dynamic panels*, pp. 161-177. Emerald Group Publishing Limited, 2001.
- Cetorelli, Nicola, and Linda S. Goldberg. "Global banks and international shock transmission: Evidence from the crisis." *IMF Economic Review* 59, no. 1 (2011): 41-76.
- Chinn, Menzie D., and Hiro Ito. "What matters for financial development? Capital controls, institutions, and interactions." *Journal of Development Economics* 81, no. 1 (2006): 163-192.
- Desbordes, Rodolphe, and Shang-Jin Wei. "Foreign direct investment and external financing conditions: evidence from normal and crisis times." *The Scandinavian Journal of Economics* 119, no. 4 (2017): 1129-1166.
- Domanski, Dietrich. "Foreign banks in emerging market economies: changing players, changing issues." *BIS Quarterly Review, December* (2005).
- Engle, Robert F., and Clive WJ Granger. "Co-integration and error correction: representation, estimation, and testing." *Econometrica: journal of the Econometric Society* (1987): 251-276.
- Goldberg, Linda. *Financial-sector FDI and host countries: New and old lessons*. No. w10441. National Bureau of Economic Research, 2004.
- Goldberg, Linda S. "Understanding banking sector globalization." *IMF Staff Papers* 56, no. 1 (2009): 171-197.
- Hermes, Niels, and Robert Lensink. "Foreign direct investment, financial development and economic growth." *The Journal of Development Studies* 40, no. 1 (2003): 142-163.

Herrero, Alicia García, and Daniel Navia Simón. *Determinants and impact of financial sector FDI to emerging economies: a home country's perspective*. Banco de España, Servicio de Estudios, 2003.

Im, Kyung So, M. Hashem Pesaran, and Yongcheol Shin. "Testing for unit roots in heterogeneous panels." *Journal of Econometrics* 115, no. 1 (2003): 53-74.

Kao, Chihwa. "Spurious regression and residual-based tests for cointegration in panel data." *Journal of Econometrics* 90, no. 1 (1999): 1-44.

Knight, Malcolm. "Developing countries and the globalization of financial markets." *World Development* 26, no. 7 (1998): 1185-1200.

Kose, M. Ayhan, Eswar S. Prasad, and Marco E. Terrones. "Does openness to international financial flows raise productivity growth?." *Journal of International Money and Finance* 28, no. 4 (2009): 554-580.

Levin, Andrew, Chien-Fu Lin, and Chia-Shang James Chu. "Unit root tests in panel data: asymptotic and finite-sample properties." *Journal of Econometrics* 108, no. 1 (2002): 1-24.

Li, Donghui, and Fariborz Moshirian. "International investment in insurance services in the US." *Journal of Multinational Financial Management* 14, no. 3 (2004): 249-260.

Mehrara, Mohsen. "Energy consumption and economic growth: the case of oil exporting countries." *Energy Policy* 35, no. 5 (2007): 2939-2945.

Moshirian, F. "Determinants of international financial investment income flows." *Journal of Multinational Financial Management* 6, no. 4 (1996): 1-24.

Moshirian, Fariborz. "International investment in financial services." *Journal of Banking & Finance* 25, no. 2 (2001): 317-337.

Moshirian, Fariborz. "Aspects of international financial services." *Journal of Banking & Finance* 30, no. 4 (2006): 1057-1064.

Pedroni, Peter. "Critical values for cointegration tests in heterogeneous panels with multiple regressors." *Oxford Bulletin of Economics and Statistics* 61, no. S1 (1999): 653-670.

Pedroni, Peter. "Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis." *Econometric Theory* 20, no. 3 (2004): 597-625.

Sahin, Serkan, and Ilhan Ege. "Financial development and FDI in Greece and neighbouring countries: A panel data analysis." *Procedia Economics and Finance* 24 (2015): 583-588.

Shan, Jordan. "A VAR approach to the economics of FDI in China." *Applied Economics* 34, no. 7 (2002): 885-893.

**Appendix: List of countries**

Argentina, Bangladesh, Bolivia, Chile, Costa Rica, Dominican Republic, Hong Kong, Israel, Korea Rep., Madagascar, Morocco, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Saudi Arabia, Singapore, South Africa, Thailand, Trinidad and Tobago, Turkey, Uganda.

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