査読論文

FDI and TFP Growth Nexus: Role of Local Financial Development

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Abstract

Evaluating the impact of foreign direct investment (FDI) on host country development has been an imperative topic of debate in economic research. Previous studies support the notion that the benefits of FDI are conditional on local conditions of the host country. Among the local conditions, this study examines whether financial system development can exploit the benefits of FDI to improve host countries' total factor productivity (TFP). The use of a dynamic panel regression model for an extended time period (1980–2016) and for a substantial number of developed and developing countries makes this paper distinct from other comparable studies. In particular, Blundell and Bond's (1998) system GMM approach is used in this study to deal with the endogeneity issue in the presence of unobserved country fixed effects. The empirical findings show that local financial sector development plays a key role in mediating the possible benefits of FDI in improving developing countries' TFP but not that of developed countries. The findings are robust to different financial market measures, such as private sector credit by the whole financial system, private sector credit by deposit money banks, shares of liquid liabilities over GDP, and deposit money bank assets to total bank assets.

Keywords

Foreign Direct Investment (FDI), Financial System Development, Total Factor Productivity (TFP).

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1. Introduction

The world has experienced a sharp rise in cross-country capital flows since the early 1990s. The worldwide capital flow shows an increasing trend toward developing countries, which largely comprises foreign direct investment (FDI) flows rather than portfolio or equity investment. After the 2007–08 global financial crisis, the world experienced a sharp decline in cross-border capital flows. However, compared to the other global capital flows, FDI flows to developing countries rebounded very quickly (Duttagupta et al., 2011). It is widely believed that among all cross-border financial flows, FDI could generate technology spillovers and also serve as a channel for host countries to absorb managerial and other forms of organizational expertise from more advanced countries. In developing countries, capital is usually scarce relative to labor. Policy makers in developing countries generally view potential capital injection to be the key benefit of FDI because it directly raises investment and GDP in the host country (Alfaro et al., 2016). FDI, by means of capital coming from abroad, supplements the capital provided by domestic savings. Theory suggests that FDI plays a role in an economy's development endeavors via factor accumulation or via improved TFP.

Despite the theoretical implications, however, the empirical evidence illustrates no consensus regarding the benefits of FDI to the host country. In a reappraisal of financial globalization, Kose et al. (2006) lists several pieces of empirical evidence, the majority of which shows mixed findings regarding effects of FDI on economy. Investigating macro-empirical evidence, Lipsey (2004) notes that although FDI has positive impacts on wages and export volumes, the relationships between the volumes of inward FDI flows or stocks and GDP are not consistent. In a comprehensive analysis of the growth impacts of FDI, Carkovic and Levine (2005) find an initially positive association between FDI and economic growth. However, their baseline result disappears when trade and domestic financial credit are controlled for. A large amount of empirical literature, mostly recent, suggests that the absorptive capacity or conditions of a host country, like financial sector development, trade openness, institutional quality, technological development, and the stability of macroeconomic policies, play important roles in realizing the benefits of foreign investment.

Among these local conditions, in this study, we examine the intermediary role of local financial markets in directing the potential benefits of FDI for total factor productivity (TFP) growth. A majority of the foregoing empirical analysis focuses on the impacts of FDI on economic growth. This study attempts to change the direction of usual analyses by focusing on the effects of FDI on TFP growth, rather than of economic growth through financial market development. Focusing on TFP channels seems imperative as recent literature on growth has shown the important roles of TFP, rather than factor accumulation (physical and human capital), in explaining cross-country income divergence. Hall and

Jones (1999) point out that a substantial share of the variation in GDP per worker is explained by differences in TFP. Klenow and Rodriguez-Clare (1997) also illustrate that GDP growth differentials are mainly accounted for by differences in the growth rates of TFP. Bonfiglioli (2008) states that if financial integration only promotes capital accumulation and accelerates convergence, then its positive effect is expected to be short-lived. If, instead, it raises TFP, then it is most likely to stimulate long-term growth.

To test the significance of financial markets in grasping benefits from FDI, Alfaro et al. (2004) include multiple interaction terms between FDI and local financial market development indicators. They find robust positive impacts of interaction terms on the growth of host economies. Hermes and Lensink (2003) and Durham (2004) find similar findings using different samples and measurement choices. These evidences support the notion that sound local financial markets are an essential prerequisite for materializing the benefits of FDI. Their analyses are based on a sample of least developed countries.

Alfaro et al. (2009) examine the channels through which interactions between FDI and financial markets influence the host economy's economic growth. Using simple cross-sectional OLS, their analysis finds a positive interaction effect between FDI and financial markets that affects TFP growth but not the accumulation of physical or human capital. Prasad et al. (2007) also find that foreign investment improves the productivity growth of finance-dependent industries but only when the host country's financial markets are developed. Bilir et al. (2015) assess the influence of host-country financial conditions on the international operations of multinational firms. They show that strong local capital markets attract more foreign firms, which they termed the financing effect. Another effect is also discussed in that study: the competition effect, in which affiliate sales are reoriented away from the local market due to increased entry by credit-constrained domestic firms. The competiveness of local firms increases as foreign firms enter. They show that developed financial markets are related to lower foreign firm sales in the host country (horizontal FDI) and higher sales to the home and third countries (vertical and export platform FDI). Empirical findings from foreign affiliates of U.S. firms suggest that developing a country's financial market conditions by one standard deviation, on average, was related with a 2.5-percentage-point decrease in host country sales and with 1.0- and 1.5-percentage-point increases in the shares of exports to the United States and third countries, respectively. This finding also implies that FDI will increase exports in countries where the financial markets are developed.

Collimating the macro-findings, Villegas-Sanchez (2009), using firm-level data from Mexico, find that the productivity of domestic firms increase from FDI only if the firms are from financially developed regions. She also shows that domestic firms experience negative spillover from FDI if they are located in regions where access to finance is difficult.

This paper is motivated by Alfaro et al. (2004) and Alfaro et al. (2009). Alfaro et al. (2004) examine the role of local financial institutions in channeling FDI's contributions to economic growth, and Alfaro

et al. (2009) study whether this effect operates through factor accumulation and/or improvements in TFP. Their findings, based on simple OLS regression of cross-sectional data from 1975 to 1995 for 72 countries, suggest that countries with well-developed financial markets gain TFP improvements rather than factor accumulation through FDI. Our study is complementary to theirs, in that we use a more wide-ranging and updated dataset. We provide empirical evidence using dynamic panel regressions (system GMM and fixed effect) from a sample of more than 100 countries observed over the period of 1980-2016. Using cross-sectional regressions, Alfaro et al. (2009) examine the long-term growth effect. They just use the average of FDI inflow to GDP over 20 years for each country, and regress TFP growth rates on FDI inflow along with other control variables. This line of study naturally cannot examine the temporary effects of FDI inflow on growth. The best approach to utilize cross-country differences would be panel regressions that could highlight the temporary growth effects (Lee 2016). In our study, we use a dynamic panel regression of five-year average data to move beyond very-short-term effects and also to examine the persistent effect of FDI on productivity growth. Moreover, using simple OLS estimation it is difficult to address the issue of reverse causality – the likelihood that higher productivity growth attracts more FDI and the associated problem of endogeneity. In our empirical analysis, we use system GMM approach which technically deals with endogeneity and is currently regarded as sound econometric method. In addition, this study focuses more deeply on the roles of the host economy's local financial market in realizing the benefits of FDI on productivity growth for two clusters (high-income and middle-income level) of countries. Contrary to Alfaro et al. (2009), our findings for the whole sample fail to firmly support that a high level of financial sector development will increase the marginal effects of FDI on TFP growth when system GMM estimation is used to address the endogeneity issue. However, we find that middle-income developing countries with a well-functioning financial market gains significant TFP growth from FDI. To the best of our knowledge, clustering economies according to income level and showing cluster-wise differences in the intermediary roles of local financial markets in channeling the benefits of FDI have not done before.

The rest of the paper is ordered as follows: the empirical framework is briefly explained in Section 2; the data, measures of different variables, and their sources are shown in Section 3; the empirical findings are discussed in Section 4; and Section 5 concludes this paper.

2. Empirical Methodology

The empirical framework is based on standard cross-country growth regressions to capture the effects of FDI on TFP growth at the national level and also to see the intermediary role of local financial markets in channeling the contributions of FDI to TFP growth. In this study, we use a dynamic panel

regression framework. Rather than focusing on high-frequency (year-to-year) data, this framework focuses on comparatively low-frequency data (five-year average). This five-year-average data will eliminate very-short-term effects and also create an opportunity to observe whether FDI has a persistent effect on productivity growth.

In terms of panel regression, one important econometric issue of concern is reverse causality. Higher productivity growth may attract more foreign investment and creates the problem of endogeneity. Regrettably, finding a proper instrument at the country level that affects FDI but not TFP growth is difficult. Therefore, we have used Blundell and Bond's (1998) system GMM approach to deal with the endogeneity issue in the presence of unobserved country fixed effects. The system GMM approach mechanically deals with endogeneity and is regarded as sound econometric method. As its instruments, it uses suitable lagged levels and lagged first differences of the regressors. System GMM eliminates the unobserved country-specific term and also controls for the potential endogeneity of all of the explanatory variables, including the lagged dependent variable, as an instrument. Sargan's over-identification test and the Arellano-Bond AR (2) test have been used to confirm the instruments' validity and to measure the second-order serial correlation, respectively. Prior to system GMM, basic fixed-effects estimation is also conducted. Use of both model serve as consistency check of the findings.

As discussed earlier, dynamic panel regressions are used based on five-year-average data for each country to exploit the time-series variation in the data. The baseline regression specifications are as follows:

$$\Delta TFP_{i,t} = \beta_0 + \beta_1 TFP_{i,t-1} + \beta_2 FDI_{i,t} + \beta_3 FMD_{i,t} + \beta_4 (FDI_{i,t} * FMD_{i,t}) + \lambda Z_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad \text{.....(1)},$$

where $\Delta TFP_{i,t}$ is the growth of TFP, $TFP_{i,t-1}$ is the level of TFP at the beginning of each five-year period, $FDI_{i,t}$ represents the flow of FDI to GDP, and $FMD_{i,t}$ stands for financial market development indicators of the host country.[1] $Z_{i,t}$ is the set of relevant control variables, μ_t symbolizes time dummies (for each five-year period), η_i stands for country fixed effects, and $\varepsilon_{i,t}$ is the error terms. The subscripts "i" and "t" index the country and time, respectively.

3. Data

Various data sources were utilized for empirical analysis in this study, including the World Development Indicators (WDI), the latest version of the Penn World Tables (PWT, Version 9.1, Feenstra, Inklaar, and Timmer, 2015), United Nations Conference on Trade and Development (UNCTAD) Statistics, and other databases maintained and developed by the World Bank. The dataset comprises five-

year averages based on annual data over the period 1980–2016 for a large number of countries.[2] Detailed descriptions of the variables in the dataset, as well as their sources, are presented in Appendix I. Data for the three major variables – measures of TFP growth, FDI, and financial market development – are discussed in this section.

The standard Cobb-Douglas production function-written as:

$$Y = AK^{\alpha} (HL)^{1-\alpha}$$

Here, Y denotes the aggregate output, A is the stock of knowledge or TFP, K and H indicate the stocks of physical and human capital, respectively, and L is the number of workers. The estimation of α and time series information on Y, K, H, and L is required to measure TFP. α is the parameter that indicates the share of physical capital in total national income. The growth rate of TFP, which is obtained as residuals in the growth accounting, is often recognized as technological progress. In this analysis, we have utilized TFP from the Penn World Table (PWT) 9.1. TFP values are at 2011 constant national prices. TFP growth has calculated over each five-year period.

A general source for the FDI data is the UNCTAD statistics, which report inward and outward FDI flows and stock data. Our baseline model focuses on the inflows to the economy; therefore, we choose to use the net inflow of FDI over GDP. The net FDI inflows reported by the UNCTAD statistics measure the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in a country other than that of the investor. The UNCTAD directly collects published and unpublished national official FDI information from central banks, statistical offices, and national authorities. These data are further complemented by data obtained from alternative sources.[3]

In brief, financial market is formed by the economic agents to alleviate the economic consequences of information and transaction cost. More purposely, financial market emerges to reduce the costs of finding prospective investments, assembling savings, managing risk, and conducting exchanges. Theory also suggest that through providing above services to economy financial market influence savings and allocation decisions and in turn effects long-run economic growth. For empirical analysis constructing accurate, comparable and distinct financial market development variable for an extensive number of countries is very difficult. For financial market development measure this study follows Levine et al. (2000) and Alfaro et al. (2009).

First, we have considered private sector credit of the whole financial system, as a share of GDP (Pvt.cr). Credit issued by central and development banks is excluded from this measure. Pvt.cr segregates credit issued to the private sector, as opposed to credit issued to governments, government

agencies, and public enterprises. Second, we have included private sector credit by deposit money banks as a share of GDP (Pvtcr_bank). Compared to earlier measure Pvt.cr, this measure excludes non-bank credit to the private sector. These two measures do not directly access the betterment of information and transaction costs. However, we might interpret higher level of private credit as indicative of higher levels of financial services and therefore greater financial intermediary development (Levine et al. 2000). Third, we used the share of liquid liabilities over GDP (LL) as a financial market variable. This is calculated as currency plus demand and interest-bearing liabilities of banks and non-financial intermediaries divided by GDP. This measures financial intermediation in a broader sense and includes three major categories of financial institutions: the central bank, deposit money banks, and other financial institutions. LL is a usual measure of financial depth of the financial market. One major drawback of this measure is 'double counting' as it includes deposits by one financial institution in another. LL is commonly accepted measure of financial market development indicator under the assumption that the size of the financial market is positively correlated with the provision and quality of financial services. Finally, we have incorporated deposit money bank assets to total bank assets (DMBA), which measures the asset structure of the banking sector. This is measured as a ratio of commercial bank assets divided by commercial bank plus central bank assets. DMBA measures the extent to which commercial banks versus the central bank allocate society's savings. However, DMBA is not a direct measure of the quality and quantity of financial services provided by financial intermediaries. All of these financial market variables are obtained from the World Bank Financial Structure Database.

4. Empirical Findings

This section deals with the formal regression analysis. As mentioned earlier, dynamic panel regressions are used to exploit the time series dimension of the data. Five-year averages of the underlying annual data are used in the panel regressions. The data gives a maximum of eight observations per country. First, the role of host country's financial market development in realizing the benefits of FDI has been elaborately discussed. Then, the basic analysis has been extended by observing the differences in findings for country groups with different income levels.

Before conducting System GMM estimation, initially in Table 1 fixed-effect (FE) model is used to examine the role of FDI on TFP growth through financial market development. Fixed effect model is effective in controlling for omitted variable bias due to unobserved heterogeneity when this heterogeneity is constant over time. We interact FDI with financial market development (FMD) variables and use these individual interaction terms as regressors (the second column of each panel) to test for the importance of financial markets in boosting the benefits associated with FDI flows. As shown in Table 1,

the first panel (column 1-2) uses Pvt.cr (private sector credit as a share of GDP), the second panel (column 3-4) uses Pvt.cr_bank (private sector credit by deposit money banks as a share of GDP), the third panel (column 5-6) uses LL (share of liquid liabilities over GDP), and the fourth panel (column 7-8) uses DMBA (deposit money bank assets to total bank assets) as an FMD indicator.[4] None of the regression specifications show that FDI inflow has a significant positive association with TFP growth. These results support the findings in the literature that FDI does not exert a robust positive impact on productivity growth. This indefinite effect of FDI and the function of the local financial situation have motivated this current research.

Table 1
Total Factor Productivity (TFP), FDI, and Financial Development: Fixed Effects
(Dependent variable: TFP growth; five-year panel)

	Pvt.cr		Pvt.cr_bank		LL		DMBA	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial TFP	−6.2410***	−6.2845***	−6.2327***	−6.2867***	−6.2648***	−6.3761***	−6.2389***	−5.9870***
	(0.7724)	(0.7662)	(0.7704)	(0.7626)	(0.6978)	(0.6883)	(0.6630)	(0.6385)
FDI_flow	0.0665	−0.5265**	0.0657	−0.5887**	0.0765	−1.0200***	0.0337	−4.6415***
	(0.0666)	(0.2272)	(0.0667)	(0.2275)	(0.0596)	(0.3019)	(0.0568)	(0.7906)
FMD	0.1837	−0.2718	0.1787	−0.3087	1.0504**	0.2917	3.9228***	0.4706
	(0.2291)	(0.2819)	(0.2256)	(0.2760)	(0.4128)	(0.4555)	(0.6050)	(0.8229)
FDI*FMD		0.1687***		0.1882***		0.2931***		1.0580***
		(0.0618)		(0.0626)		(0.0792)		(0.1785)
Enroll_se	0.0137	0.0153	0.0137	0.0153	0.0138	0.0162	0.0091	0.0100
	(0.0112)	(0.0111)	(0.0112)	(0.0111)	(0.0100)	(0.0099)	(0.0095)	(0.0091)
Trade _open	−0.3416	−0.1516	−0.3389	−0.1359	−0.5129	−0.3038	−0.4566	−0.2839
	(0.5336)	(0.5337)	(0.5333)	(0.5321)	(0.4903)	(0.4865)	(0.4578)	(0.4408)
CPI	0.4404**	0.4448**	0.4350**	0.4457**	0.3796**	0.4281**	0.0290	0.1437
	(0.1879)	(0.1863)	(0.1888)	(0.1869)	(0.1701)	(0.1681)	(0.1731)	(0.1674)
Govt.cons	−1.4749**	−1.3623**	−1.4641**	−1.3520**	−1.6040***	−1.3181**	−0.7259	−0.5167
	(0.6193)	(0.6155)	(0.6197)	(0.6144)	(0.5805)	(0.5772)	(0.5506)	(0.5303)
Observations	498	498	498	498	547	547	530	530
R^2	0.2337	0.2484	0.2337	0.2515	0.2486	0.2720	0.3063	0.3611
No. of countries	104	104	104	104	107	107	106	106

Notes:
1. The dependent variable is the growth rate of TFP over each five-year period.
2. All standard errors are robust and reported in parentheses.
3. Statistical significance: *** p < 0.01, ** p < 0.05, * p < 0.1.
4. Intercept not reported.
5. All of the regressions include time and country dummies.
6. For the variables, see Appendix-I.

However, the interaction term turns out to be positive and statistically significant (at a 1 percent significance level) in all of the panels. These positive significant coefficients for the interaction terms can be explained as high levels of financial sector development increasing the marginal effect of FDI on TFP growth. The answer to the hypothetical question “How much would a one-standard-deviation increase in the financial market development variable improve the productivity growth of the host country receiving an average level of FDI?” can be used to estimate the importance of financial sector development in enhancing the growth benefits of FDI. If we use Pvt.cr (i.e., column 2), it turns out that a one-standard-deviation increase in private credit by the financial system of a country that receives the mean level of FDI suggests that the TFP growth rate will improve by approximately 0.10 percentage points.[5] This effect varies from 0.10 to 0.90 percentage points, depending on the choice of the financial market development variable.

As noted earlier, an econometric issue which is a key concern about these regressions is that FDI and TFP growth may be endogenous. To properly control the endogeneity issue, we adopt system GMM estimation in Table 2. Similar to the FE estimation findings, we do not find that FDI inflows have exogenous positive impact on TFP growth. In contrast to the FE, system GMM estimation exhibits that the interaction terms between FDI and the financial market development variables are not statistically significant, although the coefficients are positive. The specification tests also confirm the validity of the findings. After addressing the endogeneity issue by system GMM estimation, we cannot firmly conclude that a high level of financial sector development will increase the marginal effects of FDI on TFP growth. This finding contrasts those of Alfaro et al. (2009), who find that countries with developed financial markets significantly benefit from FDI in terms of TFP growth. They adopt a simple cross-section OLS strategy over the period of 1975-1995 for 62 countries. Contrary to Alfaro et al. (2009), this paper uses dynamic penal regression over a longer time period for more than 100 countries. Cross-sectional regressions cannot capture the time-varying effects of independent variables and cannot detain the short-term effects. Henry (2007) highlights that most cross-country empirical studies fail to show short-term effects. Moreover, Hsu and Wu (2009) argue that the effects of FDI and financial development on growth give rise to the possibility of both endogeneity and the reverse causality of FDI and financial development. Considering these issues, panel regression seems more desirable than cross-sectional analysis in testing the productivity growth effects within countries.

At this stage of analysis, we check whether the baseline results vary according to the income status of each country. The full sample is split into two groups (middle income and high income) by income level. The World Bank income group classification is considered for the splitting.

Table 2
Total Factor Productivity (TFP), FDI, and Financial Development: System GMM
(Dependent variable: TFP growth; five-year panel)

	Pvt.cr		Pvt.cr_bank		LL		DMBA	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial TFP	−12.1278***	−13.3976***	−13.5221***	−12.2468***	−13.0672***	−12.5372***	−10.8838***	−11.3213***
	(2.1638)	(1.5198)	(1.5533)	(1.7990)	(1.3759)	(1.3694)	(1.2688)	(1.3776)
FDI_flow	−0.2044*	−0.2620	−0.1154	−1.0849	−0.1122	−1.1640	−0.1006	−1.5914
	(0.1217)	(0.1938)	(0.0781)	(0.7169)	(0.0716)	(0.9275)	(0.0638)	(2.9180)
FMD	0.7476**	0.6221*	0.7455**	−0.0118	0.6920	−0.0033	4.8427***	3.6135
	(0.3513)	(0.3770)	(0.3028)	(0.6321)	(0.4405)	(0.7193)	(0.7298)	(2.3171)
FDI*FMD		0.0464		0.2745		0.2840		0.3426
		(0.0527)		(0.2018)		(0.2500)		(0.6628)
Enroll_se	0.0102	0.0312**	0.0324**	0.0234	0.0269**	0.0225*	0.0296***	0.0261**
	(0.0341)	(0.0139)	(0.0136)	(0.0150)	(0.0126)	(0.0127)	(0.0098)	(0.0106)
Trade_open	3.2537*	1.4527*	1.6272*	1.8065**	1.6502**	1.5163**	1.9774***	1.5213**
	(1.8011)	(0.8362)	(0.8768)	(0.8766)	(0.7631)	(0.7078)	(0.7155)	(0.6505)
CPI	0.1594	0.7842***	0.8304***	0.6009*	0.8393***	0.6979**	0.2511	0.1750
	(0.7735)	(0.2842)	(0.2851)	(0.3285)	(0.2839)	(0.3012)	(0.2939)	(0.3018)
Govt.cons	−6.4021	−2.6568	−2.7523	−3.6015*	−2.2925	−2.4881	−2.9001**	−2.1450*
	(4.4567)	(1.6869)	(1.7988)	(1.8845)	(1.6807)	(1.6254)	(1.4063)	(1.2693)
Observations	498	498	498	498	547	547	530	530
No. of countries	104	104	104	104	107	107	106	106
Specification test (p value)								
Sargan OID	0.293	0.181	0.169	0.173	0.106	0.107	0.429	0.237
AR(2)	0.199	0.663	0.714	0.295	0.525	0.368	0.527	0.567
No. of Instruments	20	27	26	26	26	32	26	32

Note: Same as Table 1.

After restricting the sample to these groups, the key regressions are re-estimated. The results are reported in Table 3 and 4 for the middle-income and high-income groups, respectively. Only system GMM estimation is considered for this analysis. Table 3 exhibits the results for 54 middle-income countries. Each columns in Table 3 shows negative significant coefficients for FDI_flow, which implies that FDI has a negative impact on TFP growth for middle-income developing countries. However, the interaction terms between FDI and the financial market development indicators are statistically significant and positive in all panels. These positive significant coefficients of interaction terms can briefly be expressed as follows: developing countries with well-functioning financial markets gain significantly from FDI, in terms of TFP growth. Among the interaction term coefficients, interactions with private credit in the whole financial system (Pvt.cr), private credit by deposit money banks (Pvt.cr_bank), and deposit money banks' assets (DMBA) are significant at the 1 percent level of significance,

and liquid liabilities (LL) is significant at a 5 percent level of significance. Again, the hypothetical exercise of attributing the TFP growth effects of a one-standard-deviation enhancement in the financial sector variables for the (middle-income) host country suggests that the TFP growth rate will improve by approximately 0.56 percentage points to 0.76 percentage points, depending on which alternative financial market development variables are selected.[6] This result is subject to an assumption that the host countries received a mean level of FDI over the sample period of time.

As all of the regression specifications in Table 3 show strong complementary effects between FDI and financial development on the growth of TFP, this result is consistent with the thought that the FDI can increase the growth of the host economy only by interacting with that economy's absorptive capability or local condition. It is, however, confusing that coefficient of FDI variable yields a negative sign, which implies that FDI makes a negative contribution to TFP growth in middle income countries with a low level of financial development. One could accept that FDI makes no further contribution to TFP growth, but it is hard to conceive situations in which, if the country has a very low level of financial market development, FDI would actually detract from TFP growth. Most likely, the estimates result from the linearization of what is probably a nonlinear interaction between FDI and financial development. That is, it is likely that at very low levels of financial development the contribution of FDI to growth is close to nil and that it rises gradually as level of financial development increases. However, a linear least squares estimation of this function yields a negative intercept (at zero level of financial development). Nevertheless, the estimated effect of FDI on TFP growth may be approximately correct for middle income developing countries with nearly average values of financial development.[7]

Table 4 exhibits the results for high-income countries. Contrary to the middle-income countries, the high-income-country sample shows that FDI has a positive impact on TFP growth. This finding supports the thought that FDI spillovers are greater in developed than in developing countries. Our main focus in this study – the role of FDI on TFP growth through financial market development – is statistically insignificant in the case of high-income developed countries. Usually, high-income countries have developed financial markets. The developed financial market does not play a role in mediating the benefits of FDI on TFP growth for high-income countries.

On the other hand, firms from middle- or low-income developing countries face credit constraints. It becomes easier for credit-constrained entrepreneurs to start their own businesses if the local financial sector improves. Many small businesses, with the help of financial facilities from the local financial market, can increase the variety and quality of the intermediate goods they produce and supply them to the upstream foreign firms that operate in the country. In this way, the financial market facilitates FDI spillover through backward linkages between foreign and domestic firms.

Table 3

TFP, FDI and Financial Development: Middle-Income Countries System GMM Estimation

(Dependent variable: TFP growth; five-year panel)

	Pvt.cr		Pvt.cr_bank		LL		DMBA	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial TFP	−12.9555***	−13.5803***	−12.8046***	−10.5294***	−13.3868***	−11.5240***	−11.8951***	−10.4640***
	(2.9121)	(2.5737)	(2.8376)	(3.0017)	(2.8176)	(2.8472)	(2.3113)	(2.2225)
FDI_flow	−0.4063***	−1.8322***	−0.3936***	−3.9142***	−0.4587***	−3.6532**	−0.2098	−7.8085***
	(0.1491)	(0.5949)	(0.1421)	(1.3324)	(0.1495)	(1.8105)	(0.1313)	(2.9145)
FMD	−0.2795	−0.3499**	−0.2630	−1.7594***	−0.7036*	−1.2508**	−1.0283**	−1.7826
	(0.3009)	(0.6487)	(0.2825)	(1.3096)	(0.4142)	(1.4909)	(0.8176)	(2.7190)
FDI*FMD		0.4165***		1.0779***		0.9171**		1.7305***
		(0.1559)		(0.4056)		(0.5182)		(0.6631)
Enroll_se	−0.0050	0.0115	−0.0062	0.0293	−0.0051	0.0130	−0.0115	0.0058
	(0.0207)	(0.0219)	(0.0204)	(0.0246)	(0.0209)	(0.0221)	(0.0178)	(0.0178)
Trade_open	2.6059*	1.8104	2.6132**	1.7029	2.7928**	1.9889	2.0565**	2.1732**
	(1.3380)	(1.3680)	(1.3270)	(1.3883)	(1.2750)	(1.2804)	(1.0246)	(0.9558)
CPI	1.1907***	0.8508*	1.1935***	0.3553	1.2772***	0.8524*	0.4828	0.3677
	(0.4236)	(0.4376)	(0.4301)	(0.5381)	(0.4353)	(0.4740)	(0.4168)	(0.3909)
Govt.cons	0.3328	3.0668	0.0542	1.5487	1.5180	1.6656	−1.5490	−0.6958
	(3.6013)	(3.5558)	(3.4270)	(3.5199)	(3.3779)	(3.1726)	(2.5765)	(2.4231)
Observations	275	275	275	275	277	277	269	269
No. of countries	54	54	54	54	54	54	54	54
Specification test (p value)								
Sargan OID	0.429	0.636	0.388	0.830	0.779	0.766	0.563	0.610
AR(2)	0.404	0.484	0.461	0.600	0.272	0.498	0.774	0.770
No. of Instruments	26	27	26	26	32	32	32	32

Note: Same as Table 1.

Table 4

TFP, FDI, and Financial Development: High-Income Countries System GMM Estimation

(Dependent variable: TFP growth; five-year panel)

	Pvt.cr		Pvt.cr_bank		LL		DMBA	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial TFP	−10.3403***	−10.7463***	−10.3823***	−10.6524***	−7.7518***	−6.6413*	−6.7685***	−6.7759***
	(3.1616)	(2.8294)	(3.3500)	(3.1478)	(2.9662)	(3.4296)	(2.0304)	(2.0656)
FDI_flow	0.4651**	2.1464	0.4644**	1.5452	0.5576**	−2.6294	0.2260***	0.3215
	(0.1864)	(1.8362)	(0.1875)	(1.8524)	(0.2258)	(3.9318)	(0.0756)	(4.9618)
FMD	−0.0208	0.8038	0.0045	0.6032	0.4802	−1.3136	3.1435**	3.1940
	(0.2741)	(0.9291)	(0.2519)	(1.0481)	(0.5444)	(2.2831)	(1.5607)	(3.0539)
FDI*FMD		−0.3974		−0.2588		0.7798		−0.0211
		(0.4323)		(0.4416)		(0.9602)		(1.0989)
Enroll_se	−0.0078	−0.0000	−0.0087	−0.0062	0.0052	0.0065	−0.0031	−0.0032
	(0.0451)	(0.0408)	(0.0457)	(0.0427)	(0.0428)	(0.0454)	(0.0195)	(0.0202)
Trade_open	−1.4371	−1.7954	−1.3834	−1.5312	−2.7326*	−3.3582*	−0.8200	−0.8189
	(1.3294)	(1.2381)	(1.3637)	(1.2924)	(1.4479)	(1.7177)	(0.6614)	(0.6639)
CPI	−2.3920*	−2.0398*	−2.3941*	−2.2371*	−2.4097*	−2.6687*	−1.1085**	−1.1035*
	(1.3277)	(1.2346)	(1.3339)	(1.2685)	(1.3829)	(1.5006)	(0.5555)	(0.6129)
Govt.cons	9.6812	7.4419	9.8046	8.5144	10.1734	11.7813	3.3937	3.3952
	(7.1817)	(6.7997)	(7.6611)	(7.4536)	(10.1286)	(10.9204)	(2.1535)	(2.1540)
Observations	179	179	179	179	225	225	216	216
No. of id	40	40	40	40	42	42	41	41
Specification test (p value)								
Sargan OID	0.498	0.266	0.504	0.317	0.435	0505	0.596	0.516
AR(2)	0.892	0.605	0.811	0.732	0.890	0.973	0.486	0.488
No. of Instruments	18	18	18	18	18	18	22	22

Note: Same as Table 1.

5. Conclusion

Despite the fall in worldwide FDI flows for three consecutive years (2016–2018), FDI to developing countries is continuing its upward trend. In 2018, developing economies accounted for a growing share of global FDI, at 54 percent, from 46 percent in 2017.[8] This growing share of FDI in developing countries poses both opportunities and challenges to host countries and the global economy as a whole (Alfaro et al., 2016). Evaluating the impacts of FDI flows on host economy development has been an imperative topic of debate in economic research and policy analysis. Diverse evidence has made the debate more inconclusive. Given the indecisiveness in the field, one finding has emerged: that the host country's local conditions or absorptive capacities play vital roles in realizing the benefits of FDI.

Among these conditions, local financial market development plays an essential role.

This study examined the role of local financial market development in mediating the possible benefits of FDI regarding improvements to the host country's TFP. We do not find solid evidence that the local financial market plays an important role in directing the benefits of FDI, in terms of TFP growth, for all countries. However, our findings firmly support that local financial sector development plays a key role in mediating the possible benefits of FDI regarding improvements to middle-income developing countries' TFP. Policy makers in developing countries might implement more prudent policies to improve domestic conditions, which should have twofold effect; of welcoming foreign investment and also facilitating host countries to maximize the benefit of FDI.

As a limitation, we have less understanding of how financial market development affects competition between foreign firms and local firms. Another remaining issue is whether foreign firms use financial advantages to crowd out local firms and derive monopoly businesses in the host market. These issues are beyond the scope of this paper and will be good areas for future work.

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Notes

1 The Financial market development variables are discussed in Data section.

2 The number of countries varies depending on the particular model setting.

3 Sources: (i) Other international organizations such as the International Monetary Fund (IMF), the World Bank, and the Organization for Economic Co-operation and Development (OECD); (ii) regional organizations such as the ASEAN Secretariat, European Bank for Reconstruction and Development (EBRD), Banque Centrale des Etats de l'Afrique de l'Ouest, Banque des Etats de l'Afrique Centrale, and Eastern Caribbean Central Bank; and (iii) UNCTAD's own estimates.

4 See the data section for details.

5 To measure the effect, we used $(\beta_4 * \text{mean } FDI_i * \sigma_{\log FMD}) + \beta_3 \sigma_{\log FMD}$.
The mean value for FDI/GDP was 2.30 percent. The standard deviation (σ) of log (Pvt.cr), log (Pvt.cr_bank), log (LL), and log (DMBA) was 1.0029, 0.9872, 0.8124, and 0.311 respectively.

6 For developing countries, the mean value of FDI/GDP is 2.49 percent, and the standard deviation (σ) of log (Pvt.cr), log (Pvt.cr_bank), log (LL), and log (DMBA) is 0.817, 0.799, 0.628, and 0.299, respectively.

7 The estimation of a nonlinear functional form might not be a good idea, however. This would require

adding higher order terms for the variables such as FDI squared, FMD squared, FDI times FMD squared, etc. This would lessen the degrees of freedom in the estimation. In addition, it might cause significant multicollinearity problems also.

8 See World Investment Report 2019.

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Appendices

Appendix I: Variable Definitions and Data Sources

Variables	Definition	Source
TFP growth	5 year average growth of TFP	Penn World Table 9.1
Initial TFP	TFP from previous period	Penn World Table 9.1
FDI flow	Foreign direct investment, net inflows (% of GDP)	United Nations Conference on Trade and Development (UNCTAD) Statistics
Pvt.cr	log (domestic credit to private sector by whole financial system as share of GDP)	The World Bank Financial Structure Database
Pvt.cr_bank	log (private credit by deposit money banks as share of GDP)	The World Bank Financial Structure Database
LL	log (liquid liabilities as share of GDP)	The World Bank Financial Structure Database
DMBC	log (deposit money bank asset to total bank asset)	The World Bank Financial Structure Database
Enroll_se	log (School enrollment, secondary)	World Development Indicator
Trade-Open	Trade openness log (average of exports + imports as a share of GDP)	World Development Indicator
CPI	log (1 + cpi)	World Development Indicator
Govt.cons	log (general government final consumption expenditure as share of GDP)	World Development Indicator