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Institutional quality, financial development and OFDI☆

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Abstract

Using a panel of 73 countries from 2000 to 2008, this study uses Investment Development Path theory as a framework that utilises institutional quality (IQ) as a threshold for the effect of economic development on OFDI. Using the dynamic threshold model, we find new evidence that the strong promoting effect is initiated when IQ is within a certain interval, which is supplementary to IDP theory. Finally, we propose the corresponding advice.

Keywords: Institutional quality; Financial development; OFDI; Dynamic threshold

Introduction

The OLI theory [6] determines that MNEs should have an ownership advantage, location advantage and internalisation advantage before OFDI and should become the theory that explains OFDI in emerging countries early in their development. The Investment Development Path theory [18] indicates that a country's FDI/OFDI depends on its level of economic development and summarises the characteristic five stages of FDI/OFDI; only if the GDP per capita reaches 3000–4000 US dollars (approximately 7000–8000 in US dollars today) will the OFDI begin to scale. However, the Investment Development Path theory is contrary to the fact that a large quantity of OFDI throughout the world comes from emerging markets, such as China and India, where the income level is low. The phenomenon may result from the promoting function of government and the financial advantage from excessive foreign exchange reserves under the condition of a domestic institutional void and the relative lag of economic development (large in gross but low on average), realising a leapfrog development path for its OFDI. In addition, some other emerging countries that have reached the required per capita income still strongly promote the OFDI, such as Brazil and Russia.

☆ Institutional quality was introduced as a dummy for policy liberalisation [5] and then extended into other detailed indicators, such as trade and foreign exchange liberalisation, privatisation reform, enterprise restructuring reforms, overall institutional reforms, and competition reforms [15]. The authors would like to thank the sponsorship from National Natural Science Funds (71473025).

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Most emerging markets experience a long term central economy and a short time market economy, so a large proportion of state-owned enterprise exists and the market mechanism is not perfect. Once OFDI is treated as a native economic strategy, the strong power and administrative methods from the government will still promote the international firms under the condition of a low level of economic development. However, in developed economies, because of the sound institutional quality (IQ), high economic development and core technology controlled in firms, the support from government declines into a secondary position. The dynamic process reminds us that a nonlinear influence of economic development on OFDI comes into being, which depends on a certain level of institutional quality in the economy, causing a first increased then decreased development path. The dynamic process is also a valid supplement to Dunning's IDP theory.

Based on this background, the paper integrates the institutional quality (including the strength of legal rights index, the overall institutional reform, the privatisation process and trade openness) into the economic development stage, extends the IDP theory effectively, and utilises a regression model based on the concept of dynamic panel threshold model (DPTM) and dynamic panel to test the nonlinear influence and leapfrog development characteristic of OFDI using country specific institutional quality as a threshold. Our fitted model allows the relationship between economic development and OFDI to be piecewise linear, with the IQ as a regime-switching trigger. Using cross-country data from 73 economies from 2000 to 2008, we find strong evidence of threshold effects in the economic-development-OFDI link. Specifically, we find that the strong promoting effect of economic development on OFDI begins only when the IQ is within a certain interval. At this time, the strong benefits of economic development exist.

The paper is structured as follows. Section 2 reviews the literature, and further development of our hypothesis is presented in Section 3. Section 4 discusses the results and performs a series of robustness tests, in which we explore alternative measures of IQ, while Section 5 provides some conclusions.

Review of the literature

The influence of institutional factors on OFDI

The OLI theory usually supposes that the MNEs should have ownership advantages before OFDI, while the IDP theory emphasises in which stage the MNEs from emerging economies may begin to invest abroad. However, for the characteristics of asset-seeking purpose and leapfrog development, the former theories appear to be lacking full explanatory power. The research in OFDI of Russia finds that we must augment the traditional OLI and IDP theory and must introduce the country specific institutional factors to the theories [11]. In addition, the theory should embed three types of explanatory variables into the MNE theories: imperfect capital markets, special ownership advantages, and institutional factors [5,17]. The research of Buckley [5] found that the liberalisation of government policy has a significant effect on Chinese OFDI, emphasising the importance of institutional factors. However, in this paper, only dummy variables are used to capture the change in institutions, so in later research, continuous, endogenous institutional variables are used to explain OFDI in emerging countries. All of the studies found important evidence that specific institutional reforms, such as the liberalisation of trade and foreign exchange, privatisation, competitive reform and overall institutional reform, will affect OFDI in emerging markets significantly. Further, the range of the study extends from emerging countries, such as China, India, and Russia, to Malaysia, Thailand, Latin America, Central Europe, East Europe and all emerging countries. The extant framework of theories also extend from traditional ideas (OLI, IDP, Natural-based view, and internationalisation theory) to LLL theory, the strategy tripod (resource, industry, and institution), imperfect capital markets, special ownership advantage and institutional factors embedded in traditional MNEs theories.

The influence of financial factors on OFDI

Froot [8] first proposed the question of low efficiency in financial markets and explored the effect of exchange rate on FDI. Later, many reports in the literature started to focus on effect of exchange rate on transnational M&A in the condition of financial inefficiency and then extended to other aspects for finance and FDI [1,12] or the financial development in country level [2]; subsequently, reports studied the influence of firm specific capital cost on FDI [7], constructed the relationship between financing and domestic OFDI on a theoretical basis [10,14], and combined country specific financial advantage and firm specific financial advantage to explore enterprises' foreign investment in the condition of financial constraints.

When financial markets are (partially) segmented, one can distinguish between two main groups of mechanisms, whereby a firm's financing may have an effect on its propensity for undertaking FDI: reactive and proactive firm behaviour [13]. The first group refers to opportunistic firm behaviour in response to financial market imperfections. The second group contains measures that were undertaken to improve the availability of capital and/or to lower the cost of capital. Oxelheim [13] took imperfect international financial integration as their point of departure. They assumed a two-tier world capital market with partial segmentation, where a local firm can choose to stay in its home market and face the local cost of capital or invest in 'proactive financial strategies' to internationalise its cost of capital and reap the benefits of the economies of scale and scope attributable to a multinational firm. Such financial strategies may include cross-listing its stock in a more liquid stock market, foreign issuing of equity and/or debt, and 'bonding' strategies to reduce information asymmetries. These types of strategy, they suggest, may foment a financial advantage vis-à-vis competitors – or eliminate a financial disadvantage – which can be exploited by undertaking FDI. Tolmunen and Torstila [16] study one such proactive strategy. They found that European firms that have cross-listed their stock in a US stock market are significantly more likely to make acquisitions in the US. They interpret the results in terms of the European firms' need for a viable 'M&A currency' and their need to reduce information asymmetries, and overcoming home bias. The above study presented another way of stating the need to reduce a financial ownership disadvantage.

Data and methodology

Data

The data set consists of cross-country observations for 73 economies (46 emerging countries and 27 developed countries, presented in Table 3) from 2000 to 2008. All data were extracted from the World Bank Database (WBD) or Economic Freedom of the World: 2010 Annual Report and expressed as the percentage of GDP, except IQ, GDP per capita, and hr. As for the financial factors, we focus only on the credit market and equity market because they are the most feasible sources of financing for the majority of emerging and developed countries in our sample. Similar to Stoian [15]; we utilise the strength of legal rights index (slr), which measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending; slr has a range from 1 to 10 (1 = weak to 10 = strong) (see Table 1).

Methodology in the empirical research

There are two items that must be addressed when constructing a dynamic PTM. First, one of the regressors is the lagged dependent variable, which makes our model a dynamic panel model (DPM). If we use the regular fixed-effect model of panel model analysis, then there would be bias caused by the correlation between the lagged dependent variable and the residual. To address this bias, we use the system generalised method of moment (GMM) proposed by Blundell and Bond [4] to conduct the estimation. Second, if the panel data are nonlinear, then one must use PTM to reveal the properties. Overall, the two questions can be solved individually, and if they were to be solved simultaneously, then the residual may have an autocorrelation problem. Overall, we estimate the model using two steps: (1) the static PTM (see Ref. [9] and (2) the DPTM. Once γ is identified, estimates of the slope parameters follow as $\beta(\hat{\gamma})$. Finally, we test the significance of threshold γ via a model-based bootstrap, the validity and properties of which have been established in Ref. [9].

In step 1, we utilise the static PTM proposed by Hansen [9] to explore the nonlinear characteristic of the panel data. If we were to assume that there is only one threshold in the model, then the model can be expressed as

$$y_{i,t} = \mu_i + \beta_1' x_{i,t} I(q_{i,t} \le \gamma) + \beta_2' x_{i,t} I(q_{i,t} > \gamma) + e_{i,t} \quad (1)$$

where μ_i is the country fixed effect; $x_{i,t}$ is the exogenous variables; $q_{i,t}$ is the threshold variable, $i = 1 \ldots N$ denotes the country; $t = 1 \ldots T$ denotes the time; and γ is the threshold value. $I(\bullet)$ in Eq. (1) is the indicator function. If the condition in the parentheses holds, then $I = 1$; otherwise, $I = 0$.

Assume $\beta = (\beta_1', \beta_2')'$ and define the $x_{i,t}(\gamma)$ as

$$x_{i,t}(\gamma) = \begin{bmatrix} x_{i,t} I(q_{i,t} \le \gamma) \\ x_{i,t} I(q_{i,t} > \gamma) \end{bmatrix} \quad (2)$$

Then we can simplify Eq. (1) as

$$y_{i,t} = \mu_i + \beta' \overline{x}_{i.}(\gamma) + e_{i,t} \quad (3)$$

For each i, take the average of Eq. (3); then we derive

$$\overline{y}_{i.} = \mu_i + \beta^{'}\overline{x}_{i.}(\gamma) + \overline{e}_{i.} \tag{4}$$

we can write Eq. (5) as

$$Y^* = X^*(\gamma)\beta + e^* \tag{5}$$

The residual is $\widehat{e}^*(\gamma) = Y^* - X^*(\gamma)\widehat{\beta}$, and the sum of the squared error $S_1^*(\gamma)$ is

$$S_1^*(\gamma) = e^*(\gamma)^{'}e^*(\gamma) \tag{6}$$

To obtain the optimal threshold value, one can repeat the estimation process described above, using the γ within the possible value range to achieve $S_1^*(\gamma)$. The γ value that corresponds to the minimum $S_1^*(\gamma)$ is the optimal threshold value $\widehat{\gamma}$.

The estimator matrix of the threshold regression is $\widehat{\theta}(\widehat{\gamma})$, the residual is $\widehat{e}^*(\widehat{\gamma})$, and the residual variance is

$$\widehat{\sigma}^{2=}\frac{1}{N(T-1)}\widehat{e}^{*1}(\widehat{\gamma})\widehat{e}^*(\widehat{\gamma}) = \frac{1}{N(T-1)}S_1^*(\widehat{\gamma}) \tag{7}$$

After we obtain $\widehat{\gamma}$, we must test for the existence of the threshold effect. The null hypothesis is $H_0 : \beta_{1=}\beta_2$. In step 2, we use the GMM method proposed by Blundell and Bond [4] to conduct the estimation. We transform the PTM in the first step into a linear panel data model. By using the dummy variable, we can still reveal the nonlinear characteristic identified in step 1. In addition, we add $y_{i,t-1}$ as one of the regressors; as a result, our model is the DPDM with a nonlinear characteristic. Following the specification of Eq. (5) and by adding $y_{i,t}^{1^*}(= y_{i,t-1}^*)$ as one of the regressors, we specify the model as follows:

$$y_{i,t}^* = \mu_i + \rho y_{i,t}^{1^*} + \beta_1^{'}x_{i,t}^*\mathrm{DV}(R_1) + \beta_2^{'}x_{i,t}^*\mathrm{DV}(R_2) + e_{i,t}^* \tag{8}$$

$$Y^* = Y^{1^*}\rho + X^{R^*}\beta + e^* \tag{9}$$

where $\mathrm{DV}(R_1)$ and $\mathrm{DV}(R_2)$ are the dummy variables that denote regimes 1 and 2, respectively, and the values of the dummy variables come from the PTM estimation in step 1.

Before conducting the GMM estimation, we must ascertain whether the orthogonal condition holds. The condition is:

$$E\left[y_{1,t-s}^{1^*}\left(e_{i,t}^* - e_{i,t-1}^*\right)\right] = 0 \quad s = 2,\ldots,t-1, t = 3,\ldots,T$$

$$E\left[x_{1,s}^{R^*}\left(e_{i,t}^* - e_{i,t-1}^*\right)\right] = 0 \quad s = 2,\ldots,t-1, t = 3,\ldots,T. \tag{10}$$

It is obvious that as t becomes larger, the number of orthogonal conditions increases. Rewriting Eq. (10) into a matrix, we obtain Eq. (11):

$$E\left[W_i^{*'}\left(e_{i,t}^* - e_{i,t-1}^*\right)\right] = 0 \quad i = 1,\ldots,N. \tag{11}$$

Let the GMM estimator matrix be $\widehat{\theta}(\widehat{\rho}^{'}, \widehat{\beta}^{'})$ and

$$\widehat{\theta} = \left(X^{R^*\prime}W^*A_NW^{*\prime}X^{R^*}\right)^{-1}X^{R^*\prime}W^*A_NW^{*\prime}Y \tag{12}$$

In Eq. (12), $A_N = [(1/N)\sum_{i=1}^{N}W_i^{*\prime}HW_i^*]^{-1}$, where H is a (T-2) × (T-2) matrix.

Model specification and empirical results

Model specification

According to the depiction in Section 3, we define our basic model to capture the influence of economic development on OFDI, utilising IQ as a threshold:

$$\begin{aligned} ofdi_{it} =& \alpha + \phi ofdi_{it-1} + \beta_1^{'}invest_{it} + \beta_2^{'}finance_{it} \\ &+ \beta_3^{'}control_{it} + \beta_4 gdp{\bullet}I(r_1 : iq < \gamma_1) \\ &+ \beta_5 gdp{\bullet}I(r_2 : \gamma_1 \le iq \le \gamma_2) \\ &+ \beta_6 gdp{\bullet}I(r_3 : iq > \gamma_2) + \varepsilon_{it} \end{aligned} \tag{13}$$

where *ofdi* is outward foreign direct investment over GDP from 2000 to 2008; *invest* is an investing indicator vector that includes the annual fixed assets investment over GDP (fix), annual R&D investment over GDP (rd), and foreign direct investment over GDP (fdi); *finance* is a financial development indicator vector that includes private credit amount over GDP (credit) and stock market value over GDP (stock); *control* is a vector of controlling variables hypothesised to affect OFDI, which includes human capital (defined as average years of secondary years, hr) and natural resource (defined as total amount of natural resource stock over GDP, nature). In our model, the IQ indicators act as sample splitting variables. The above specification allows the effects of GDP per capita on OFDI to take on different values, depending on whether the level of IQ is smaller or larger than the threshold γ, and the corresponding coefficients are β_4, β_5, and β_6.

Empirical results

According to the principle of the panel threshold model, we estimate the model under the hypothesis of no threshold, single threshold and double thresholds at the significance level of 1%, 5% and 10%, respectively. The results are presented in Table 2, indicating that

Table 1
Descriptive statistics for the main variables.

Variables		Mean	S.E	Min	Max
Investment indicators	OFDI	3.1811	7.076	–	89.450
	FDI	5.1579	6.811	–	92.670
	Fixed assets	21.711	5.047	10.37	42.540
	R&D	1.0784	1.021	–	4.7700
Financial development	Private credit	73.9902	53.88	–	319.56
	Stock value	48.351	69.53	–	442.79
Controlling variables	IQ	5.7656	2.390	1.000	10.000
	GDP/capita	14.237	15.36	0.370	87.340
	Openness	94.106	63.10	20.49	456.65
	Natural resource	9.5134	13.15	–	39.290
	Human resource	21.842	15.08	–	85.000

Table 2
LM-test for the threshold effect.

LM-test	*F*-value	*P*-value	1%	5%	10%
Null	14.947***	0.0000	9.5628	4.3905	2.6224
Single	7.1688**	0.0375	8.4970	3.2273	2.0309
Double	1.21	0.5349	7.3171	3.1569	1.9219

double thresholds exist in the model. That is, there is a nonlinear effect of economic development on OFDI using IQ as a threshold. The calculated thresholds are 4 and 8.

Table 3 presents the results of estimating Eq. (13) using slr as a threshold variable. Double thresholds (4 and 8) exist in the model, so the sample can be split into three groups. Countries with a slr of less than 4 are classified into the low-IQ group (usually less developed countries simultaneously accompanied by low economic development), those with slr of more than 8 are classified into the high-IQ group (usually developed countries), and the others are classified into the middle-IQ group (most emerging countries). The coefficients on GDP per capita presented in Table 3 are all insignificant in the low-IQ group; thus, they are consistent with the prediction of IDP (nearly no promotion from economic development and government); the coefficients in the middle-IQ group are more significant and larger than those in the high-IQ group, that is, promotion from most emerging country governments is stronger than that in developed countries in the condition of an institutional void. As a result, the promotion of economic development to OFDI is usually larger in the emerging countries, realising a leapfrog development path. This result is also beyond the prediction of IDP because it occurs regardless of the IQ factors and is also a valid supplement to IDP. The promotion function of the government in developed countries decreases, that is, the country specific advantage is not significant, and the capital account tends to converge, which is consistent with the prediction of IDP theory. Regarding the effect of financial development on OFDI, both the credit market and the stock market will promote OFDI. Although both coefficients of the financial markets are significant, the credit market is more influential than the stock market. This difference is because a bank dominated financial system exists in emerging markets, while a capital dominated financial system exists in developed markets. In addition, in our sample, the number of emerging countries is greater than the number of developed countries.

Two robustness checks are performed for the main regression. First, we assess the effect of outliers on the estimation results. Following the idea proposed by

Table 3
Regression results.

Variable	Model 1		Model 2		Model 3		Model 4	
	Coefficient	s.e.	Coefficient	s.e.	Coefficient	s.e.	Coefficient	s.e.
OFDI(-1)	0.9347***	0.0456	0.9251***	0.0424	0.9149***	0.0415	0.8978***	0.0408
Credit	0.0467***	0.0039					0.0206*	0.0015
Stock			0.0267***	0.0019			0.011**	0.0009
FDI					0.3083***	0.0152	0.2765***	0.0121
RD	0.1325	0.0221	0.1341	0.0246	0.1026	0.0115	0.1058	0.0132
Fix	0.0284	0.0021	0.1009	0.0112	−0.1313*	0.0124	−0.1754**	0.0129
Hr	−0.0704	0.0051	−0.0494	0.0022	−0.0443	0.0036	−0.0333	0.0031
Nature	0.0126	0.0013	−0.0118	0.0011	0.0256	0.0026	0.0316	0.0031
Gdp(r1)	0.057	0.0051	0.0867	0.0069	−0.0969	0.0072	−0.1926	0.0191
Gdp(r2)	0.1662**	0.0184	0.181***	0.0195	0.1827***	0.0219	0.1803***	0.0199
Gdp(r3)	0.0385	0.0027	0.0223	0.0021	0.0356	0.0024	0.114**	0.0119

***, **, and * represent significance levels at 0.01, 0.05, and 0.1, respectively; r1, r2, and r3 represent the low IQ, middle IQ, and high IQ groups, respectively. The s.e. denotes the robust standard error of each variable.

Belsley [3]; the so-called DFITS statistic is used to flag countries with high combinations of residuals and leverage statistics. Excluding the outliers does not change the basic format of Eq. (1). Second, we test whether the middle-IQ group can be split further into subgroups[2]. The result presents an insignificant p-value of 0.651, which suggests that a three-regime specification is adequate. Therefore, the previous interpretation is unchanged and stable.

Conclusion

We presented new evidence on the role that institutional quality plays in mediating the impact of economic development on OFDI based on data from 73 countries from 2000 to 2008. One contribution of the paper is the adoption of the regression model based on the idea of a dynamic panel threshold effect to capture the rich dynamic change in the relationship between economic development, OFDI and institutional quality. We found that the strong promoting effect of economic development on OFDI begins only when IQ is within a certain range; in addition, we found that the strong promoting effect of economic development on OFDI is a valid supplement to Dunning's IDP theory. As the IQ increases, the promotion function of the government decreases, causing a nonlinear effect on OFDI. The low IQ accompanied by low economic development (less developed countries) will not promote OFDI significantly. This result is consistent with the prediction of IDP theory. When IQ increases, the influence of economic development on OFDI in emerging countries is larger than that in developed countries, utilising IQ as a threshold. This result indicates that a strong promotion from government exists in the case of an institutional void. This finding underlines the importance of government to formulate effective institutions to encourage OFDI and realise a leapfrog development for the country.

From the above analysis, we can conclude: first, institutional reform may precede and compensate for the shortage in technology to a certain extent in the current stage in emerging countries, changing technological disadvantages to country specific advantages. Second, a government may provide financial and fiscal support for MNEs OFDI by relying on macro financial advantages, deepening financial markets reform and the degree of openness, and improving capital allocation efficiency. Third, although the economic development level is usually preceded by OFDI in emerging markets, more attention should be paid to matching economic development to OFDI development. Finally, each government should pay attention to the availability of OFDI policies and avoid becoming a capital flight channel for OFDI to not be adverse to the economy and employment development in the home country.

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