Determinant of FDI inflow from Asian Economies to Lao PDR

Visansack Khamphengvong¹, Enjun Xia² and Khaysy Srithilat²

¹ School of Management and Economics, Beijing Institute of Technology.
² University of Finance and Economics, Dalian, China

Visansack_kp@yahoo.com

Abstract. FDI inflow plays an essential role in economic growth in any countries. Thus FDI inflow and its impact on economic growth deserve attention in the economics literatures. This article intends to analyses the main determinant of FDI inflow from some Asian countries that contributed a high value of investment in Lao PDR. The static and dynamic gravity models were applied to panel data over 1995-2015 time periods. The findings conclude that the natural resource (hydropower, mining), FDI in the previous year, market size (home countries), inflation rate, infrastructure, and WTO have the positive impact on FDI inflow. While real exchange rate, trade openness, ASEAN, distance, and crisis are not the critical determinant to attract FDI from Asian countries.

Keywords: FDI inflow; Asian Economies; Dynamic gravity model; Lao PDR

1. Introduction

Foreign direct investment (FDI) is one vital source of economic development in developing countries, which lack of financial resources and under development of financial market. Insufficient domestic saving might cause the gap between the investment and saving in the nation. Many developing countries tried to attract FDI by promoting state its self to global because the volume of FDI would bring a massive capital to the nation, increase job opportunity, technology spillover, and the increase of FDI can effect to infrastructure development to the state [1, 2]. FDI not only performance as a significant source of funding for bank loans, but also expand capital accumulation and more intensifies the quality of capital stock [3]. Moreover, inwards of FDI in the host country can generate the potential for export volume and further opportunities accessing the global markets [4].

Numerous of empirical studies have been conducted on foreign direct investment. Vernon [5] developed econometric framework as production cycle and suggests that production function divided into four elements such as innovation, production growth, reach to maturity, and decline. The research of Dunning [6] represented the Eclectic framework which discusses on activities of the investment abroad; the context describes FDI behaviour. The eclectic theory provides an extensive framework and the concept reviewed to comprehend the complexities of multinational enterprises (MNEs) activities. It commonly knows that the framework regularly recognised as the OLI paradigm as it brings together advantage of ownership, location and internalisation (OLI) [7]. Hymer [8] conducted the theory of the production of foreign firms. The MNEs activities abroad would have the advantage while investments overseas, which have specific ownership advantage. When invests abroad, the MNEs faced with high competition, thus the property of benefits could be sufficient than a disadvantage. The international
production framework requires to explicitly considering the competitive advantages that arise from the way corporations organise their business transactions. The increased of interdependence on the mid-market, expansion of regional and country asset portfolios to create an external economy of dependence [9]. Cave [10] established the Multinational Enterprises (MNEs) and tried to clarify that when multinational enterprises access to the host country, they have an excellent opportunity changing monopoly power from the technology spillover, knowledge dissemination, production technique, cost reduction, and other component associated. The evidence form Buckley and Peter Casson [11] constructed internationalisation framework to understand deeply on the production and impact of multinational corporations. Later, Helpman and Makusen [12, 13] also developed the same theory and counselled that MNEs have to understand clearly before invest abroad such as market-searching of the horizontal FDI. It is necessary for the investors to monitor the economic environment, domestic market, as much as to focus on the local manufacturing in the recipient countries. Another indispensable called horizontal FDI which represented research-seeking activities of the MNEs on how to access to infrastructure obtains to low labour cost, natural resources, and another component like exchange rate.

2. Data and econometrics methodology
The dataset of this work was obtained from various sources from Lao PDR such as Ministry of planning and investment, National Statistic Centre, the Bank of Lao of PDR, and the World development indicators (WDI 2017). The section applies the panel data from 1995 to 2015, by involving the gravity model to investigate the primary determinant of Asian FDI flow into Lao PDR. This article takes seven Asian countries which have a tremendous amount of investment in the recipient country including China, Vietnam, Thailand, Singapore, Malaysia, Korea and Japan

2.1. Econometric methodology
The present research work employs the gravity model proposed by [14–16] to capture the determinant of foreign direct investment in selected Asian countries. The gravity model widely used along the line of economic to solve the problem of international trade and foreign direct investment in their countries, the present work performed both dynamic and static model simultaneously by applying a fixed effect, random effect and Generalized Method of Movement (GMM) suggested by [17, 18]. The estimation acquired from fixed effect approach produces consistent estimate across the selected group of countries irrespective the correlation between individual effect and explanatory variable. Fixed effect model performed under Ordinary Least Square (OLS) which expressed follow

Static gravity equation:

\[ \ln FDI_{ijt} = \alpha + \beta_1 \ln \text{hydro}_{jt} + \beta_2 \ln \text{min}_{jt} + \beta_3 \ln \text{Market}_{it} + \beta_4 \ln \text{Market}_{jt} + \beta_5 \ln GDP_{ipt} + \beta_6 \ln GDP_{jpt} + \beta_7 \ln \text{exch}_{ijt} + \beta_8 \text{openess}_{jt} + \beta_9 \text{INFI}_{jt} \]

\[ + \beta_{10} \text{INFRAS}_{jt} + \beta_{11} \ln \text{DIST}_{ij} + \beta_{12} \text{ASEAN}_{jt} + \beta_{13} \text{Crises}_{jt} + \beta_{14} \text{WTO}_{jt} + \varepsilon_{ijt} \]

(1)

Where \( FDI_{ijt} \) represents the foreign direct investment inflow from the country \( i \) (source country) to the country \( j \) (host country) at time period \( t \), \( \text{hydro}_{it} \), \( \text{min}_{it} \), are the total investment in hydropower and mining represented as natural resource density in the host country \( j \), \( \text{Market}_{it} \) and \( \text{Market}_{jt} \) stand for the market size between home country \( i \) and host country \( j \) represented by GDP between both countries, \( GDP_{ipt} \) and \( GDP_{jpt} \) are presented GDP per capita which is a proxy of labour cost of home country \( i \) and host country \( j \) [19], \( \text{exch}_{ijt} \) stand for the real exchange rate between host country \( j \) and home country \( i \), \( \text{openess}_{jt} \) is a trade openness of the host country \( j \) estimated of total import and export divide as percentage of GDP, \( \text{infla}_{jt} \) is an inflation rate of the
host country \( j \), \( infra_{ijt} \) is air transport carrier departure worldwide in the host country \( j \), \( dist_{ij} \) is denote as the geographic distance among the capital city of the home country \( i \) and the host country \( j \). ASEAN is the dummy of the years that Lao PDR became a member of ASEAN (1997), Crisis is dummy of years that host country \( j \) faced to the global financial crisis (2008-2009), defined as 1 for 2008 and 2009, and zero for other year. WTO represented the dummy of year accession to the World Trade Organization of the host country \( j \) in 2013 (WTO), defined as 0 prior accession to WTO and 1 after accession to WTO. To resolve the issue [18] proposed a system GMM estimator that combines a system with the first difference and level regression. However, the vast majority of empirical research included in the necessary explanatory variables related to distance and geographic information between home and host countries. Therefore, the observed model of the Lao PDR determinant in selected Asian countries can be expressed as follows:

Dynamic gravity equation

\[
lnFDI_{ijt} = \alpha + \beta_1 LnFDI_{i,t-1} + \beta_2 Lnhydro_{jt} + \beta_3 Lnmin_{jt} + \beta_4 lnMarket_{it} + \beta_5 lnMarket_{jt} + \beta_6 lnGDP_{pt} + \beta_7 lnGDP_{pt_{jt}} + \beta_8 Lnexch_{ijt} + \beta_9 openness_{jt} + \beta_{10} INFL_{jt} + \beta_{11} INFRAS_{jt} + \beta_{12} LnDIST_{ij} + \beta_{13} ASEAN_{jt} + \beta_{14} Crises_{jt} + \beta_{15} WTO_{jt} + \epsilon_{ijt} \]  

(2)

3. Results of the static models

3.1. Results of the static models

In the static models suggests that the coefficient of natural resource (hydropower, mining) is positive and statistically at 1% significantly (table1), which indicate that the country where have wealth natural resource is critical determinant FDI inflow into the country [20, 21]. The GDP as a market size between home and host state explains the growth of economics. The result of static models found that the size of the origin country is the crucial consideration for them to access to the host country [22]. The negative coefficient in the host country is the labour-intensive, and the result suggests that low cost of wage in the host country is an opportunities to support FDI [23]. However, the estimated of real exchange rate on this models is not confirmed the relationship between FDI and exchange rate. Similar to the coefficient result of trade openness in the host country that might not the essential central support the inflow of FDI. The estimated coefficient of inflation rate suggests that high inflation rate in the host country might decrease the number FDI into the recipient country [24]. The result of infrastructure in the host country indicated that the consequence of the coefficient is positive and statistically significant to support FDI in the host country [25]. Nevertheless, the result of the distance indicated that the geographic distance between the origin and host country is not positive and insignificant to support FDI. In the same order, the outcome of dummy variables including ASEAN, crisis, and WTO are insignificant, which meaning that ASEAN, crisis, and WTO is not the impact essential to support FDI in the host country.

3.2. Results of GMM dynamic models

In the GMM estimator, the authors applied the lagged FDI to present the investment condition in the previous year of the host country. The estimation of lagged variable expected the result to be confident and significant of statistically, the gravity model on FDI result should be dynamical. According to the coefficient, the result has confirmed the view which indicates the effect of FDI is positive and significant at 1%. The result suggests that the environment of investment in the previous year is critical for investor’s consideration before access to the host country. The finding of prior studies also recommended that lagged FDI variable has played an essential role in FDI stocks, and even conclude that FDI during the last year of the host country has vital for investors’ decision invest aboard [26, 27]
Note:***,**,* indicate the significant level at 1%, 5% 10% respectively. The Different GMM and System applied the robust standard errors.

The coefficients result also confirmed that the abundance of natural resource in the recipient country can attract more FDI inflow [28]. In the same context, The GDP coefficient indicates the positive and significant of the origin countries to encourage the FDI growth in the host country to promote the FDI growth, while the GDP per capita proxy as the labour cost does not become essential to support FDI in both homes, and the host country. Similarly, the exchange rate and trade openness are not the primary critical attract FDI into the host country. However, FDI and trade openness between home and host country are substitutable [29, 30]. GMM models suggest that high inflation rate in the recipient country may discourage the inflow to FDI [26]. However, the result of infrastructure is positive and indicates that infrastructure in the host country could bring numerous of FDI into the state [31]. Interestingly, the result of the global economic crisis was not the serious affected to FDI in the host country. Lastly, The GMM estimators recommend that the more opens

### Table 1. The estimation result of static and dynamic gravity models

| Variables       | Static estimations | Dynamic estimations |
|-----------------|--------------------|---------------------|
|                 | FE                | RE                  | Diff. GMM          | Sys.GMM            |
| $FDI_{ijt}$     | -                 | -                   | 0.9999989***       | 0.9997553***       |
| $hydro_{it}$    | 97.18341***       | 0.2358195***        | 0.0120843***       | -0.0395367***      |
| $min_{it}$      | 0.5803433***      | 0.5803797***        | -0.0029924***      | -1.594662***       |
| $Market_{it}$   | -159.6494*        | -176.516*           | -                 | 1.373132***        |
| $Market_{jt}$   | 1.878592          | -0.8658451          | 0.00000192         | 0.0010355          |
| $GDP_{ptit}$    | -2.33072          | -2.702684           | -0.00000293        | -0.00167           |
| $GDP_{ptjt}$    | 202.1326*         | 2179357*            | -                 | -                 |
| $ex actually$   | 0.0343437         | -0.0515568          | 0.000000029        | 0.0000216          |
| $Openness_{jt}$ | 0.0872791         | 0.09002735          | -0.0089946***      | -0.0539013***      |
| $infla_{jt}$    | 0.0522729**       | 0.0528511***        | 0.000359***        | -0.0751527***      |
| $infraas_{jt}$  | 0.0005923**       | 0.0005957**         | 0.0000269***       | 0.0002825***       |
| $dist_{ij}$     | -4.277381         | -                    | -0.0009069         | -                 |
| $ASEAN$         | -0.8893869        | 0.6990475           | -                 | -7.239249***       |
| $Crisis$        | 1.10539           | 0.2725493           | -0.1400701***      | 1.714349***        |
| $WTO$           | -2.325262         | -0.0131999          | 0.39333784***      | 3.631128***        |
| Constant        | -788.1586***      | -341.9257           | -                 | -                 |

**R**          | 0.085             | 0.6145              | -                 | -                 |
| N/Group No:     | 63/21             | 63/22               | 60/20             | 63/21             |
| F-Statistique   | 0.000             | 0.000               | -                 | -                 |
| Normality Test  | 0.000             | 0.000               | -                 | -                 |
| AR(2)           | -                 | -                   | 0.158             | 0.001             |
| Hansen test     | -                 | -                   | 19                | 21                |

Note:***,**,* indicate the significant level at 1%, 5% 10% respectively. The Different GMM and System applied the robust standard errors.
economic as accession to WTO in the country is more attract foreign direct investment into the country [32, 33].

4. Conclusion
The result of gravity model illustrates that the natural resource (hydropower, mining) in the recipient country is the primary source to attract FDI inflow from Asian (selected) countries to Lao PDR. In addition, the previous environment of FDI plays a significant role in the host country to support the consideration of the investment partners. In the same context, the statistic of GMM model suggests shown positive of the market size in the origin countries at 1% significantly. This result explains that the economic growth in the Asian nations much causes the increasing flow of FDI into the host country. Moreover, the infrastructure in the host country is crucial that can attract investment from Asian countries. Other critical including inflation rate and WTO also contributes the impact of FDI inflow into Lao PDR. However, the real exchange rate, trade openness, ASEAN, distance, and crisis are not the primary effect to inward FDI in the host country.

The principal impact the FDI growth in the host country depends on the various elements which from both origin and host country. However, the primary influences FDI inflow could be the factor of the recipient country. It is necessary for the host state to improve and promote the programs to support the FDI. According to the result of this article which gives some recommends to the policymaker to enhance the host country attracting more increase the investment from abroad. Similarly, the government should strengthen the human capacity and improve the ability and skill of labour. Lao PDR should develop the infrastructure, the network connecting to whole areas of the investment including road, air transportation, and railways. Importantly, the government should control economic structure and secure with stability in the long-term because the economic stability and growth can contribute the inflow of FDI. According to the empirical results of this article confirm that the leading inwards of FDI driven from the natural resource. Consequently, the host country should increase more projects and add more variety of the resource to enhance the flow of FDI into the country.

5. Acknowledgments
The authors are thankful to Mr Danish and Mr Muhammad Awais Baloch for revising and providing valuable comments to improve the manuscript.

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