

Evaluating the Effects of Trade and Investment Cooperation in East Asia

Y Dyomina¹, M Mazitova¹

¹ Economic Research Institute FEB RAS, Tikhookeanskaya Str. 153, 680042 Khabarovsk, Russia

E-mail: yandemi@yandex.com, mazitova@ecrin.ru

Abstract. The authors analyze trade and investment flows within East Asian countries as a part of international production networks (IPNs) functioning in the region. The study focuses on FDI flows between ASEAN+3 countries. Liberalization of cross-border capital flows contributed to the growth of FDI flows between ASEAN+3 countries. During 2010–2016 the average annual FDI inflows to ASEAN amounted to \$112.1 billion. The maximum volume was in 2014 (\$133.1 billion), the minimum – in 2011 (\$87.7 billion). The average annual growth rate of FDI inflows was zero. The simulation results show that due to the factors of FDI attraction East Asian countries form two groups. The first group includes ASEAN for which GDP and population of the host country don't affect FDI inflows because these countries are mostly included in global IPNs and goods produced by TNCs on their territory aren't consumed by local population and are exported to the source countries of investment. In this case, the main factors of FDI attraction are cheap local resources. The second group includes the “Big Three” for which the main factor of FDI attraction is the solvent population. In this case, the goods produced by TNCs are consumed by local population. Thus, the substantial dependence of ASEAN on “outward” FDI is due to the integration of these countries into global IPNs. Perhaps, with the increasing solvency of local population, ASEAN countries will change their position as China that has become the largest goods consumer and capital exporter in the region.

1 Introduction

There are several integration blocs in East Asia. The Association of Southeast Asian Nations (ASEAN) was formed more than 50 years ago and it's gradually moving towards deeper integration forms (a common market), however, its successful development depends on close cooperation with the “Big Three” (Japan, China and the Republic of Korea). Since these countries (along with the USA and EU) are the main trade and investment partners of ASEAN [1; 2; 3; 4].

East Asian countries are active recipients and donors of capital. Analysis of regional equity and bond markets shows that regional markets are now more closely linked to the global financial market than to each other, and Asian indices mostly have the negative effect on each other [5].

At the same time, the region attracts significant FDI amounts. Liberalization of cross-border capital flows contributed to the growth of FDI flows between ASEAN+3 countries. Liberalization process between ASEAN members began in 1987 [6], and in 2009 the ASEAN Comprehensive Investment Agreement [7] was signed, providing for a gradual transition to the free movement of capital between the members of the bloc. There is no such agreement between ASEAN+3 countries, however, such agreements were signed in ASEAN+1 format.

The study [4] shows that liberalization increased FDI flows within ASEAN and ASEAN+3 due to the shift from local financing sources to investments from the partner countries (investment creation and investment diversion effects [8]).



2 An Empirical Model and Data Source

Our empirical analysis is based on the most commonly used version of the gravity model specified by J.H. Bergstrand [9], explains the volume of trade between countries i and j by their GDPs, distance and factors that either aid or restrict trade (Equation 1).

$$X_{ij} = \alpha_0 (GDP_i)^{\alpha_1} (GDP_j)^{\alpha_2} (DIST_{ij})^{\alpha_3} (A_{ij})^{\alpha_4} \varepsilon_{ij} \quad (1)$$

where X_{ij} is the export from country i to country j ; GDP_i (GDP_j) is the value of nominal GDP in country i (j); $DIST_{ij}$ is the distance between the economic centers of country i and country j ; A_{ij} is any other factor(s) that either stimulate or reduce trade between i and j and ε_{ij} is a log-normally distributed error term with $E(\ln(\varepsilon_{ij}))=0$.

The gravity model is typically applied to bilateral trade data for a single year (or average of years) pooled over origin countries. Given the similarity between trade and FDI in terms of trends, the gravity framework has also been used to model international patterns of FDI [10, 11]. Also the standard gravity model may be mis-specified from pooling the data over source countries and/or over time and is not relevant when estimating the gravity model separately for each source country and for a single year [11]. In this study we apply the gravity model to data on the volume of FDI stock for individual countries (Equation 2).

$$FDI_{i,t} = \beta_0 (GDP_{i,t})^{\beta_1} (GDP_t)^{\beta_2} (N_{i,t})^{\beta_3} (N_t)^{\beta_4} (DIST_i)^{\beta_5} \varepsilon_{i,t} \quad (2)$$

where $FDI_{i,t}$ is inward FDI in host county (ASEAN+3 economies), varying over source countries and time. The variables representing the host country on the right hand side do not vary by country. Therefore the host country notation is simplified as to only vary by time, not various host countries. The j notation is therefore not needed, but only the i notation for source countries. The explanatory variables in Equation 2 are somewhat identical to Equation 1, but now $N_{i,t}$ and N_t have been added to the basic equation as to account for the size of the economies, where as the GDPs account for the economies' total wealth.

This basic equation specification is presented in a logarithm format (Equation 3). The logarithms are all natural logarithms. Therefore, the interaction between the variables in the equation and the dependent variable is presented in percentages, i.e. how much a percentage change in one of the variables affects the dependent variable.

$$\ln(FDI_{i,t}) = \alpha + \beta_1 \ln(GDP_{i,t}) + \beta_2 \ln(GDP_t) + \beta_3 \ln(N_{i,t}) + \beta_4 \ln(N_t) + \beta_5 \ln(DIST_i) + e_{i,t} \quad (3)$$

In this study we used a different functional form of the gravity equation (Equation 4), after applying the so-called "Inverse Hyperbolic Sine (IHS) Function" to the dependent variable, rather than applying the natural logarithm function. The procedure is preferred because of the need for transformation that does not truncate or eliminate low values of the dependent variable [12].

$$\sinh^{-1}(FDI_{i,t}) = \alpha + \beta_1 \ln(GDP_{i,t}) + \beta_2 \ln(GDP_t) + \beta_3 \ln(N_{i,t}) + \beta_4 \ln(N_t) + \beta_5 \ln(DIST_i) + e_{i,t} \quad (4)$$

The data on inward FDI stock, GDP at constant prices (2010) and population, applied in the model, comes from the United Nations Conference on Trade and Development (UNCTAD) Data Center [13; 14], the data on bilateral distances is from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) GeoDist data set [15]. The original FDI data were obtained at current prices, and then put on 2010 base using UNCTAD GDP deflator.

The analysis of regional FDI dynamics and structure was based on data from UNCTAD database [13; 14], Organisation for Economic Co-operation and Development (OECD) Statistics Database [16], International Monetary Fund (IMF) Coordinated Direct Investment Survey [17] and ASEAN Stats Foreign Direct Investment Database [18].

3 Simulation Results

During 2010–2016 the average annual FDI inflows to ASEAN economies amounted to \$112.1 billion. The maximum volume was in 2014 (\$133.1 billion), the minimum was in 2011 (\$87.7 billion). At the same time, the average annual growth rate of FDI inflows was zero.

According to the average volume of attracted FDI Brunei and Laos were “outsiders”, accounting for 0.5% and 0.6% of total annual FDI inflows to ASEAN respectively. The absolute leader among ASEAN members is Singapore (51.9% of total annual FDI inflows to bloc), the second position is occupied by Indonesia (14.3%) and the third place belongs to Malaysia (9.6%).

Only Indonesia has an ASEAN partner share of FDI inflows of more than 50% – 55.6% on average during the study period. Another four members of the bloc have more than 20%: Malaysia and Laos (20.6%), Cambodia (27.7%) and Myanmar (40.2%). The Philippines have the lowest share of ASEAN in the geographical structure of FDI inflows (2.7%). It is also worth noting that three of the Association's members (Vietnam, Laos and Thailand) attracted more than a half of the annual volume of FDI from the “outer” Asian countries (“Big Three” and Hong Kong). Brunei is the only ASEAN member heavily depending on the EU investment (its share is 72.8%).

The simulation results show that due to the factors of FDI attraction East Asian countries form 2 groups. The first group includes the ASEAN members for which GDP and population of the host country do not affect FDI inflows because these countries are mostly included in global production networks and goods produced by TNCs on their territory are not consumed by the local population and are exported to the source countries of investment. In this case, the main factors of FDI attraction are cheap local resources [2; 19; 20]. The second group includes the “Big Three” for which the main factor of FDI attraction is the solvent population. In this case, the goods produced by TNCs are consumed by the local population.

Thus, the substantial dependence of ASEAN members on “outward” FDI is due to the integration of these countries into global production networks using low-cost local resources. Perhaps, with the increasing solvency of the local population, ASEAN countries will change their position as China that has become the largest goods consumer and capital exporter in the region.

References

- [1] Mazitova M 2016 Intraregional Trade in Northeast Asia: Trends and Prospects *Power and Government in Eastern Russia* vol. 3 (76) pp. 76–81.
- [2] Mazitova M, Dyomina Ya 2017 International Production Networks *The Role of East Asia. Spatial Economics* vol. 1 (49) pp. 71–98.
- [3] Dyomina Ya 2017 International Economic Integration in the Asia Pacific Region and Russia's Interests: Results of 25 Years. *Spatial Economics* vol. 2 (50) pp.16–40.
- [4] Dyomina Ya 2017 Cross-Border Capital Flows within ASEAN and ASEAN+3. *In: Science Notes* vol. 5 pp. 27–39. ERI FEB RAS, Khabarovsk.
- [5] Dyomina Ya 2016 East Asian Capital Markets: Integration and Convergence. *Spatial Economics* vol. 3 pp. 81–104.
- [6] *Agreement on Promotion and Protection of Investments*. 15 December 1987. Manila, Philippines.
- [7] *ASEAN Comprehensive Investment Agreement*. 26 February 2009. Cha-am, Thailand.
- [8] Balassa B 1974 Trade Creation and Trade Diversion in the European Common Market: An Appraisal of the Evidence. *In: Manchester School of Economic and Social Studies* vol. 42 pp. 93–135.
- [9] Bergstrand J H 1985 The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. *The Review of Economics and Statistics* vol. 67 pp. 474–481.
- [10] Eaton J, Tamura A 1996 Japanese and US Exports and Investment as Conduit of Growth. *NBER Working Paper* 5457.

- [11] Brenton P, Di Mauro F, Liicke M 1998 Economic Integration and FDI: an Empirical Analysis of Foreign Investment in the EU and in Central and Eastern Europe. *Kiel Working Paper* 890. Institut für Weltwirtschaft (IfW), Kiel.
- [12] Kristjánsdóttir H 2005 Determinants of Foreign Direct Investment in Iceland. *CAM Working Papers* 15. University of Copenhagen, Department of Economics, Centre for Applied Microeconomics.
- [13] *Bilateral Foreign Direct Investment Statistics Database*. UNCTAD, <http://unctad.org/en/Pages/DIAE/FDI%20Statistics/FDI-Statistics-Bilateral.aspx>, last accessed 2018/04.
- [14] *UNCTAD Statistics Database*, <http://unctadstat.unctad.org>, last accessed 2018/04.
- [15] *CEPII GeoDist Database*, http://www.cepii.fr/CEPII/en/bdd_modele/download.asp?id=6, last accessed 2018/03.
- [16] *FDI Flows by Partner Country*. OECD Statistics Database, https://stats.oecd.org/Index.aspx?DataSetCode=FDI_FLOW_PARTNER, last accessed 2018/04.
- [17] *IMF Coordinated Direct Investment Survey*, <http://data.imf.org/?sk=40313609-F037-48C1-84B1-E1F1CE54D6D5&sId=1424361335820>, last accessed 2018/04.
- [18] *ASEAN Stats Foreign Direct Investment Database*, <http://aseanstats.asean.org>, last accessed 2018/04.
- [19] Dunning J 1995 Reappraising the Eclectic Paradigm in an Age of Alliance Capitalism *Journal of International Business Studies* vol. 3 pp. 461–491.
- [20] Dunning J, Lundan S 2008 *Multinational Enterprises and the Global Economy*. 2nd edn. Edward Elgar Publishing Limited, Cheltenham.