Routledge
Taylor & Francis Group

Check for updates

The impact of free trade agreements on FDI inflows: the case of Vietnam

My Duong[a,b], Mark J. Holmes[a] and Anna Strutt[a]

[a]Waikato Management School, University of Waikato, Hamilton, New Zealand; [b]Faculty of Political Economy, Hue College of Economics, Hue University, Hue City, Vietnam

ABSTRACT

We examine the relationship between FTAs and inward FDI in Vietnam using panel data for Vietnam's 17 main foreign investors over the period 1997–2016, and 23 partners for the sub-period 2005–2016. In contrast to past studies that focus on either multiple FTAs for a group of countries or case studies for a well-known FTA, we evaluate whether the overall involvement in FTAs of a developing country such as Vietnam increases FDI inflows. Results from gravity models strongly indicate that FTAs, overall, are associated with increased FDI inflows, with a much greater impact in the sub-period. We also find evidence of the prevalence of vertical FDI in Vietnam. Further examination of the later sub-period shows that FTAs also have a significant effect on inward FDI through interactions with the real exchange rate, human capital, and factor endowments. Interestingly, all of the three FDI determinants have more important roles following the FTAs.

1. Introduction

Foreign direct investment (FDI) occurs as a result of corporate strategies and investment decisions of multinational corporations (De Mello and Fukasaku 2000). It is favoured around the world, especially in developing countries, for the great benefits it brings, including a critical source of finance, technology diffusion (UNCTAD 2015), knowledge spill-over effects on domestic firms in terms of production process, innovative products, patents, establishment of production and distribution networks (Mijiyawa 2017). While large FDI flows have surged to a limited number of developing countries such as China, India and Mexico (Waldkirch 2010), increasing capital has been challenging for governments in many developing countries, particularly as it often requires significant economic reforms.

Free trade agreements (FTAs) have been viewed as an increasingly important driver of FDI in emerging countries (Yeyati, Stein, and Daude 2003). One of the most important reasons a country enters into an FTA is the expectation of increased FDI flows (Blomstrom and Kokko 1997; Medvedev 2012). In the long run, the integration is expected to increase growth rates of members thanks to greater markets,

---

CONTACT My Duong ✉ dtdmy@hce.edu.vn

improved competition capacity, better resource allocation and positive externalities (Blomstrom and Kokko 1997). However, the effects of FTAs on FDI depend on different channels such as patterns of FDI, FTAs' investment provisions, intra- and extra-FTA source countries, host country's locational advantages and interactions among them. In addition, individual members of a regional trade agreement (RTA) may experience gains or even losses in FDI flows (Feils and Rahman 2011). Therefore, it has been difficult to draw a definite conclusion on the role of FTAs on FDI because some of the channels might be in opposite directions (Yeyati, Stein, and Daude 2003), thus the expected effect of FTAs on FDI remains an open question (Medvedev 2012).

Existing analysis of the linkage between FDI and FTAs has mainly focussed on either multiple FTAs for a group of countries or case studies of a specific FTA. The question of how a particular country's general participation in FTAs impacts on its FDI flows has not received much attention. The limited studies include Crotti, Cavoli, and Wilson (2010) and Bae and Jang (2013) for Australia and Korea, respectively. However, there remains a paucity of studies assessing the overall impact of FTAs on FDI in a developing country where there has been a shortage of investment. This paper contributes to the existing literature by examining the impact on FDI inflows of the overall FTAs that Vietnam has participated in. This allows us to evaluate whether FTAs, in general, have been associated with increased FDI flows, which is a major motive for Vietnam and other developing countries pursuing FTAs. A secondary question is whether FTAs have changed investors' sensitivity to key determinants of FDI flows in Vietnam.

Furthermore, vertical FDI is more likely between industrialised and developing countries while there is a prevalence of horizontal FDI among industrialised countries (Aizenman and Noy 2006). Therefore, vertical FDI might be more popular in developing countries (Egger and Winner 2005). However, multinational enterprises (MNEs) can have a mixed option including both vertical FDI and horizontal FDI in practice (Aizenman and Noy 2006). Based on the outcomes for the FTAs and other determinants of FDI, we can further explain patterns of FDI flows in Vietnam, which have been ignored in studies analysing FDI flows in Vietnam.

Vietnam is a particularly interesting case study for several reasons. Firstly, FDI flows in Vietnam have recently become the main source of external financing for the domestic savings-investment gap. Over the period 2007–2009, FDI inflows to Vietnam, on average, accounted for 61% in capital flows (Tran 2013) and this has remained a high share, with a slight decrease to 59% during the 2010–2017 period.[1]

Secondly, although Vietnam has not received a large amount of FDI flows compared to other developing countries such as China, India and Mexico, its increasing success in attracting FDI flows has been impressive. In particular, FDI flows into Vietnam in 2017 (14.1 billion US$) were 70 times larger than the flows in 1990 (180 million US$), while the figures are 21.1, 3.7, 17.3, 11.1, and 3.0 times for Indonesia, Malaysia, Philippines, Singapore and, Thailand, respectively (UNCTAD 2018). Vietnam became the second largest FDI recipient (after Singapore) in ASEAN for the first time in 2008, continuing in 2009. In 2017, Vietnam was the third largest FDI destination in the ASEAN region, following Singapore and Indonesia (UNCTAD 2018).

Table 1. Vietnam's RTAs entering into force as of April 2019.

RTAs	Date of signature	Date of entry into force
ASEAN Free Trade Area (AFTA)	Jan-1992	Jan-1993
ASEAN-China	Nov-2004	Jan-2005
ASEAN-Korea	Aug-2006	Jan-2010
ASEAN-Japan	Mar-2008	Dec-2008
ASEAN-Australia-New Zealand	Feb-2009	Jan-2010
ASEAN-India	Aug-2009	Jan-2010
Vietnam-Eurasian Economic Union	May-2015	Oct-2016
Vietnam-Japan	Dec-2008	Oct-2009
Vietnam-Chile	Nov-2011	Jan-2014
Vietnam-Korea	May-2015	Dec-2015
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	March-2018	Dec-2018

Source: WTO (2019).

Thirdly, FDI has played a key role in Vietnam's exports. Exports from the foreign invested sector have accounted for more than 60% of Vietnam's exports since 2012, reaching 73% in 2017 (GSO 2018).[2]

Fourthly, there has been rapid trade liberalisation in the world economy, achieved through a number of RTAs, with 291 RTAs in force as of January 2019 (WTO 2019). Consistent with the global trend, Vietnam has been actively and deeply involved in trade liberalisation process, with 11 FTAs entered into force as of April 2019, as shown in Table 1. Significant changes in Vietnam's inward FDI have been observed following these FTAs.

The remainder of this paper is organised as follows. Section 2 briefly presents patterns and trends of FDI flows in Vietnam. Section 3 summarises the theoretical framework of FDI, followed by a discussion of previous relevant studies in Section 4. Model specification, data, and methodology are presented in Section 5, with Section 6 discussing the empirical results. Section 7 presents our concluding remarks.

2. Trends and patterns of FDI in Vietnam

In this section, we present trends of FDI in Vietnam, followed by a discussion of changes in Vietnam's sources of FDI and the sectoral composition of Vietnam's inward FDI flows. Figure 1 indicates FDI flows into Vietnam between 1990 and 2017. In the immediate aftermath of the Renovation Policy in the mid-1980s, Vietnam became an attractive destination of foreign firms due to a variety of investment opportunities in infrastructure and resource extraction boom (Athukorala and Tran 2012), which explains much of the rapid increase in Vietnam's inward FDI flows over the 1990–1996 period.

After reaching its peak in 1996, FDI inflows to Vietnam experienced significant decreases over the 1997–2001 period. This decrease was largely due to adverse impacts on Vietnam's investment environment due to the revised FDI law in 1996 which included some restrictions on foreign firms (Athukorala and Tran 2012; Schaumburg-Müller 2003). The Asian Financial Crisis, however, contributed to the deterioration of this downturn (Schaumburg-Müller 2003).
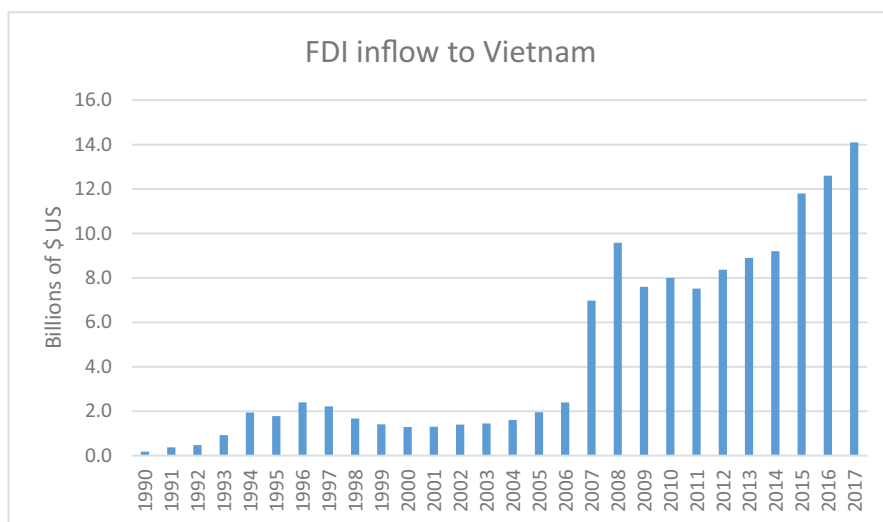
Figure 1. Annual FDI inflows to Vietnam, 1990–2017 (US$billion).

Since 2003, Vietnam has experienced a substantial increase in inward FDI. It is noticeable that FDI inflows to Vietnam in 2008, 2009, and 2010 were higher than the annual levels before the Global Financial Crisis. A survey carried out by the Economist Intelligence Unit characterised Vietnam, along with Brazil, Russia, India, and China, as the most attractive FDI destination between 2008 and 2010 (Breu et al. 2012). This is in line with UNCTAD (2010), which ranked Vietnam one of the most attractive destination for FDI over the 2007–2009 period.

Table 2 presents sources of Vietnam's inward FDI flows from FTA partners as well as other key partners. Over the 1996–2000 period, FDI flows from intra-ASEAN accounted for almost one-fifth in Vietnam's total inward FDI, followed by Japan (16.9%), Taiwan (14.4%), South Korea (10.9%), and Hong Kong (9.8%). However, these main investors contributed smaller shares between 2001 and 2005. The remaining periods experienced increasing FDI shares of partners having FTAs with Vietnam, such as ASEAN, China, Japan, and South Korea. In the most recent period from 2016 to 2017, ASEAN + 6 together accounted for 71.1% of Vietnam's total FDI inflows, with the top 3 investors including South Korea (26.1%), Japan (18.4%), and intra-ASEAN (18.1%). In contrast, although Australia, India, and New Zealand invested more in Vietnam following FTAs, their FDI shares in Vietnam's total inward FDI remain minimal.

The sectoral composition of Vietnam's FDI inflows are shown in Table 3. The manufacturing sector has been the largest FDI recipient. This sector has recently become more important, accounting for more than 70% of Vietnam's annual inward FDI in three successive years of 2012, 2013 and 2014, due to a surge of Korean investment. In 2016, 64% of Vietnam's inward FDI flows surged to this sector, with Korea making the greatest contributions (ASEAN Secretariat 2017). In contrast, mining and quarrying, which used to be the traditional beneficiaries of FDI, have seen their shares decrease over time. Their annual shares have been less than 10% since 2006, compared with the average annual shares of 28.2% for the 2000–2004 period.

Table 2. Sources of Vietnam's inward FDI (percent).

Source country	1996–2000	2001–2005	2006–2010	2011–2015	2016–2017
ASEAN + 6*	48.8	34.6	40.9	64.2	71.1
Intra-ASEAN	19.7	12.2	14.9	18.7	18.1
China	0.7	2.1	1.8	4.6	6.8
India	0.1	0.0	0.4	0.2	0.5
Japan	16.9	12.4	10.4	18.3	18.4
South Korea	10.9	6.9	12.8	21.6	26.1
Australia	0.5	0.9	0.5	0.7	1.1
NZ	0.0	0.0	0.1	0.0	0.0
Hong Kong	9.8	4.4	4.3	9.1	5.4
Taiwan	14.4	7.3	9.5	6.9	5.8
US	3.8	6.0	16.3	1.1	2.1
Others	23.2	47.6	29.0	18.7	15.7
Total (%)	100.0	100.0	100.0	100.0	100.0
Total (Mil. $US)	8,987.0	7,714.0	34,560.0	45,787.0	26,700.0

Source: Calculated based on ASEAN Secretariat database (ASEAN Secretariat 2019).
Note: * Includes 9 ASEAN members plus China, India, Japan, South Korea, Australia, and New Zealand.

Similarly, FDI shares of agriculture, fishery and forestry have gradually declined, from 7.1% in 2000 to 0.6% in 2014. It is noticeable that real estate, which attracted minimal FDI prior to 2005, has recently become a favoured sector for foreign investors, absorbing one-third of Vietnam's FDI flows in 2009. While reducing in importance somewhat, this sector maintained relatively high shares of 11% and 7% in 2015 and 2016, respectively (ASEAN Secretariat 2017).

3. Theoretical framework

In this section, we analyse firms' motivations to invest abroad before moving to discuss channels through which FTAs affect FDI flows. With regard to theories explaining why firms invest abroad, the well-known eclectic paradigm (Dunning 1981), also known as the OLI (Ownership, Location, and Internalisation) framework, discusses three conditions for FDI to occur. Firstly, the firm needs ownership advantages including both tangible and intangible firm-specific assets such as proprietary technology, trademarks, production management, organisational and marketing systems, or R&D capacity. Secondly, based on location-specific advantages such as input prices, transport and communication costs, government intervention, education, and infrastructure, the firm chooses the best foreign destination. Thirdly, internalisation advantages of a MNE mean that the firm will get more benefits if it internally exploits ownership advantages itself rather than licencing them to foreign producers. Blomstrom and Kokko (1997) and Globerman (2002) support the view that FDI is driven by the motivation to exploit firm-specific intangible assets. Horstmann and Markusen (1987) argue that serving foreign markets though horizontal FDI would be preferable to licencing strategy because it helps preserve secrecy in terms of firm-specific assets. The proximity-concentration hypothesis suggests that given greater transport costs, trade barriers, lower plant scale economies, and investment barriers, a firm is more likely to choose overseas production over exports (Brainard 1993).

FDI patterns reflect firms' motivations for investing abroad. On the one hand, a firm will engage in vertical FDI (resource seeking) by fragmenting its production process to take advantage of relatively cheap and abundant factors of production across

Table 3. Shares of FDI flows into Vietnam by sectors (%).

	Agriculture, fishery & forestry	Mining & quarrying	Manufacturing	Construction	Trade	Financial services	Real estate	Others	Total
2000	7.1	24.1	39.5	8.2	0.0	0.9	0.0	20.3	100.0
2001	9.2	23.0	38.2	5.7	0.0	1.2	0.0	22.6	100.0
2002	7.3	33.9	47.8	2.8	0.9	3.3	0.5	3.6	100.0
2003	2.9	29.8	40.2	0.3	1.8	1.2	0.4	23.4	100.0
2004	3.5	30.0	35.0	0.6	1.9	1.1	0.6	27.4	100.0
2005	2.8	12.9	59.9	1.2	3.0	1.0	2.2	17.1	100.0
2006	2.2	1.8	63.0	5.3	1.3	0.9	22.4	3.2	100.0
2007	2.3	1.8	62.4	5.4	1.4	0.8	21.9	3.9	100.0
2008	3.6	1.2	56.8	15.9	2.5	1.1	13.2	5.8	100.0
2009	0.6	1.8	15.4	2.4	1.4	0.0	34.0	44.4	100.0
2010	0.1	0.0	30.6	10.1	1.5	0.4	29.3	28.1	100.0
2011	1.0	0.5	48.5	17.2	2.9	0.0	5.0	24.8	100.0
2012	0.6	1.0	71.6	2.1	4.7	0.0	12.1	7.8	100.0
2013	0.4	0.4	76.9	1.0	2.5	0.0	4.4	14.4	100.0
2014	0.6	0.5	71.1	5.0	1.9	0.0	13.0	8.0	100.0

Source: Data compiled from the ASEAN Investment Reports 2011, 2013–2014, and 2015[8]

countries. Final products are later exported back to home countries. On the other hand, horizontal FDI (tariff-jumping or market seeking) involves duplicating an existing production facility in foreign markets. MNEs may jump trade barriers such as tariffs, distance, transportation, and insurance by serving host country's demand directly instead of through exports. Both horizontal and vertical FDI are taken into account in the models of Markusen et al. (1996) and Markusen (1997). Carr, Markusen, and Maskus (2001) draw their theoretical model from Markusen et al. (1996) and Markusen (1997), identifying it as the Knowledge-Capital model for vertical and horizontal FDI. They econometrically test the model in which various factors such as economic sizes, differences in sizes and relative endowment, trade and investment costs, and some interactions among them are considered as determinants of FDI. The Knowledge-Capital model predicts that horizontal FDI increases with both size and relative factor endowment similarities between countries, whereas vertical FDI is associated with differences in relative endowments and similarities in sizes (Carr, Markusen, and Maskus 2001; Markusen et al. 1996).

A number of key main factors contribute to how FTAs impact on FDI. Firstly, FTAs have different effects on the two patterns of FDI. Firms of an FTA member are likely to serve FTA members' demand through exports and benefit from economies of scale rather than through foreign production, due to reduced trade costs following FTAs. Thus, FTAs tend to have adverse impacts on horizontal FDI. In contrast, FTAs increase vertical FDI as it becomes cheaper for MNEs within the integrated region to export intermediate goods to FTA members and import final goods from these countries to their home countries.

Secondly, FTAs' investment provisions create an FDI-friendly environment, which stimulates inward FDI to FTA members. For example, following the AFTA, two investment packages including the ASEAN Industrial Cooperation and the ASEAN Investment Area were established to encourage both intra- and extra-ASEAN FDI flows (Ismail, Smith, and Kugler 2009; Te Velde and Bezemer 2006).

Thirdly, as a result of RTAs, non-members become important sources of increased FDI inflows due to two possible reasons. Firstly, possible increases in relative protection

against firms from non-members result in enhanced FDI from outsiders into the whole region (Blomstrom and Kokko 1997). Secondly, RTAs also generate greater market size, making the integrated areas more attractive (Buckley et al. 2001). Outside investors can launch horizontal FDI in one or more FTA members to serve the demand of these countries and use them as platforms to export to other locations of the region (Feils and Rahman 2008; Lederman, Maloney, and Serven 2003; Te Velde and Bezemer 2006).

Fourthly, locational advantages of host countries are also channels through which FTAs affect FDI. A RTA may not benefit all its members in terms of increased FDI flows, depending largely on FDI competition and location-specific advantages (Feils and Rahman 2008, 2011). FTA members with stronger locational advantages are more likely to receive FDI inflows from remaining members and outsiders (Blomstrom and Kokko 1997).

4. Previous studies

In this section, we review empirical studies examining the relationship between FTAs and FDI. We start with studies focussing on multiple FTAs for a group of countries before proceeding to summarise case studies, with a focus either on one specific FTA or country, followed by a summary of FDI studies on Vietnam.

In terms of multi-FTA studies for a large number of countries, mixed results of FTAs on FDI have been found, with a dominance of positive effects. Yeyati, Stein, and Daude (2003) use panel data covering 20 source countries from the OECD and 60 host countries during the 1982–1999 period to examine how FTAs impact on the location of FDI. Based on a gravity model, they find that FTAs increase FDI stocks between members by 27%. Medvedev (2012) accounts for all existing PTAs and uses a large panel covering 153 countries over the 1980–2004 period. His findings show that PTA membership results in a substantial increase in net FDI inflows. Using gravity models and panel data from 1980 to 2003, Feils and Rahman (2011) analyse FDI flows from 59 countries into 24 OECD host countries. They report that there is an increase in FDI flows among regional integrated area members, with greater impacts for larger economies. Thangavelu and Narjoko (2014) find that FTAs increase FDI inflows to the ASEAN region between 2000 and 2009, based on an extended gravity model.

In contrast, Lederman, Maloney, and Serven (2003) find that the coefficient on free trade area dummy has no impact on FDI flows. Ullah and Inaba (2014) analyse FDI flows to nine Asian host countries from 23 source countries over the 1995–2010 period. Similarly, estimation results of the gravity model suggests that both bilateral investment treaties and bilateral trade agreements are not associated with increased FDI flows due to existing liberal FDI policies. Dee and Gali (2003) examine effects of preferential trade agreements (PTAs) on foreign investment over the period from 1988 to 1997 using a gravity model. They find evidence of net investment creation in six of the nine PTAs examined. One PTA creates negative net investment effects while the two remaining PTAs show effects. Employing a knowledge capital model, Jang (2011) shows that bilateral FTAs have a negative effect on bilateral FDI in intra-OECD country pairs and a positive effect in extra-OECD country pairs. These

outcomes are consistent with their hypothesis that there is a dominance of horizontal FDI in intra-OECD country pairs and vertical FDI in extra-OECD country pairs.

Case studies, which focus on a specifically well-known FTA, usually report positive results, with significant difference in FDI gains among FTA members. For instance, NAFTA has received a lot of attention, with Waldkirch (2003) finding that this agreement is associated with enhanced FDI flows into Mexico from the US and Canada. Feils and Rahman (2008) indicate the US and Canada are great beneficiaries in terms of inward FDI due to the implementation of NAFTA. Based a fixed-effects gravity model, MacDermott (2007) finds that NAFTA increases FDI flows into the US, Canada, and Mexico by 0.96%, 1.54%, and 1.73%, respectively. Regarding the EU, Dunning (1997) finds that there has been an increase in both intra- and extra-European Community FDI following the Internal Market Program (IMP) launched in 1986. Lim (2001) reports MERCOSUR has had a stronger impact on FDI flows in Brazil than in Argentina, with FDI as a percent of GDP rising by 578% and 71%, respectively. Ismail, Smith, and Kugler (2009) use a gravity model and point out that during the implementation period of the AFTA from 1995 to 2003, FDI flows among original AFTA members were not as much as the bilateral FDI flows from these countries to Brunei, Laos, Myanmar and Vietnam. Li, Scollay, and Gilbert (2017) suggest that the ASEAN-China FTA has increased FDI flows to China and ASEAN-6 countries (Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam) based on an extended knowledge capital model.

There are very few case studies assessing the impact on FDI flows of overall FTAs in a specific country. The limited studies include Crotti, Cavoli, and Wilson (2010) and Bae and Jang (2013) for cases of two developed countries, Australia and Korea, respectively, with inconsistent results. In particular, Crotti, Cavoli, and Wilson (2010) examine FDI flows into Australia from 27 source countries using panel data between 1993 and 2003. They find that Australia's bilateral trade agreements are associated with increased FDI flows into Australia based on a gravity model. However, with a knowledge-capital model, Bae and Jang (2013) find that between 2000 and 2010, while FTAs increase Korea's outward FDI by more than 50%, their effects on Korea's inward FDI are negative due in part to the possible dominance of horizontal FDI over vertical FDI.

For Vietnam, there have been a variety of studies on Vietnam's FDI, with many of them analysing the role of FDI. For instance, Athukorala and Tran (2012) explore the importance of FDI in reaping developmental gains in Vietnam. Le and Pomfret (2011) assess the impact on the productivity of Vietnam's domestic firms of technology spillovers through FDI. Anwar and Nguyen (2010) and Vu, Gangnes, and Noy (2008) evaluate the impact of FDI on growth in Vietnam. Some studies examine the linkage between FDI and trade (Anwar and Nguyen 2011; Nguyen and Xing 2008; Pham and Nguyen 2013). Other studies, such as Pham (2002) and Hoang and Goujon (2014), assess the drivers of FDI inflows among Vietnamese provinces. Xaypanya, Rangkakulnuwat, and Paweenawat (2015) investigate key determinants of FDI in Vietnam and other ASEAN countries. However, very few studies account for changes in Vietnam's inward FDI following FTAs. In particular, Nguyen and Haughton (2002) examine whether there is an expansion of FDI flows into Vietnam as a result of the bilateral trade agreement between Vietnam and the US between 1990 and 1999. They find that FDI flows into Vietnam go up by 30% in the first year

following this agreement. Using the Hausman-Taylor estimator approach for the panel data covering Vietnam's 18 major FDI partners, Hoang et al. (2013) find evidence of investment diversion for Vietnam following the AFTA and the ASEAN-Australia-New Zealand FTA during the 1995–2011 period. In contrast, Le (2017) applies the Prais-Winsten panel-corrected standard error (PCSE) estimation to the 1996–2012 panel data for Vietnam's 25 main partners, showing that the ASEAN-Korea FTA and the Japan-Vietnam FTAs are associated with increased FDI flows into Vietnam during the period 1996 to 2012. These results are mixed and inconsistent, depending on study periods, methodologies used and specific FTAs. Therefore, it is imperative to have a study assessing whether FTAs have, in general, been efficient in attracting FDI flows to Vietnam.

In conclusion, there have been a wide range of studies on the link between RTAs and FDI, with mixed results. However, there has been a lack of empirical studies evaluating the impact of overall FTAs on inward FDI for a particular country, especially in the case of developing countries. The current study therefore contributes to the existing literature on FDI-FTA linkages in developing countries, with a case study of Vietnam. We also examine whether there are any changes in foreign investors' sensitivity to key drivers of FDI following FTAs in Vietnam. Furthermore, based on the outcomes for FTAs and other drivers of FDI, we provide insights into Vietnam's patterns of FDI, which are generally ignored in existing studies.

5. Model specification, data and methodology

5.1. Model specification

In this section, we measure the impact of FTAs on Vietnam's inward FDI flows using a gravity model approach.[3] Brenton, Di Mauro, and Lücke (1999) show that theoretical models explaining FDI such as OLI framework and others developed by Brainard (1997) and Markusen and Venables (2000) consider economic size and other country characteristics as important drivers of FDI, which stimulate applications of gravity models to studies on FDI. The gravity model, which seems to fit FDI flows well (Feils and Rahman 2011; Hejazi and Safarian 2005), predicts that FDI flows between two countries positively depend on the countries' economic sizes and negatively relates to the distance between them.

Faeth (2009) states that a variety of theoretical models should be combined to explain FDI. Consistent with Bevan and Estrin (2004), we extend the basic model to account for comparative advantages and institutional quality in a transitional economy such as Vietnam. A dummy variable is also added to the model to account for the impact of FTAs on FDI flows (Crotti, Cavoli, and Wilson 2010; Yeyati, Stein, and Daude 2003).

The extended gravity model for FDI flows is specified as follows:

$$
\begin{aligned}
\text{lnrFDI}_{ivt} = {} & \alpha_0 + \alpha_1 \text{lnGDP}_{vt-1} + \alpha_2 \text{lnGDP}_{it-1} + \alpha_3 \text{lnDIS}_{vi} + \alpha_4 \text{lnrER}_{vit-1} \\
& + \alpha_5 \text{lnrIMP}_{ivt-1} + \alpha_6 \text{lnDIFF}_{vit-1} + \alpha_7 \text{lnINFRA}_{vt-1} + \alpha_8 \text{HC}_{vt-1} + \alpha_9 \text{FTA}_{vit} \\
& + \alpha_{10} \text{CRISA} \ \ + \alpha_{11} \text{POLITI}_{vt-1} + \alpha_{12} \text{BOR}_{vi} + \varepsilon_{ivt}
\end{aligned}
$$

$$(1)$$

where v denotes Vietnam and i is the country partner of Vietnam. The independent variables, with the exception of the time invariant and dummy variables, are lagged one-year on the grounds that MNEs may rely on previous information to make investment decisions (Bellak, Leibrecht, and Damijan 2009; Bevan and Estrin 2004). This is also helpful in dealing with the possibility of endogeneity (Ullah and Inaba 2014).[4] $rFDI_{ivt}$ represents real FDI flows from country partner i to Vietnam. GDP_{vt} and GDP_{it} represent real GDP of Vietnam and country i, respectively. DIS_{vi} is the distance between the capital of Vietnam and that of country i. BOR_{vi} is a dummy variable that takes the value of 1 if Vietnam and country i share a common border. rER_{vit} is the real exchange rate between the currency of Vietnam (VND) and that of country i. Following Feils and Rahman (2008), $rIMP_{ivt}$, which is Vietnam's real bilateral imports from home country i, is a determinant of FDI flows. Factor endowments are important determinants of FDI flows (Bae and Jang 2013; Park and Park 2008; Yeyati, Stein, and Daude 2003). Therefore, $DIFF_{vit}$, which is the ratio of GDP per capita of Vietnam and GDP per capita of country partner i, is defined as a proxy for the differences in factor endowments between the two countries (Bae and Jang 2013). Following Ullah and Inaba (2014), potential determinants of FDI including human development, infrastructure, and institutional quality of the host country (Vietnam) are included as they are crucial stimulus for FDI. HC_{vt-1} is defined as human capital, representing the importance of labour quality in Vietnam. It is the percentage of Vietnamese students in Vietnam's total population. INFRAvt-1, a proxy for infrastructure development, is the length of railways in Vietnam. $POLITI_{vt-1}$ denotes a proxy for governance indicator. The World Development Indicators provide six governance indicators including control of corruption, government effectiveness, regulatory quality, rule of law, voice and accountability, political stability and absence of violence. A principal component of these six indicators was calculated and included in the model, but no impact was observed. Among these six individual indicators, only political stability and absence of violence positively impacts on FDI flows into Vietnam. Therefore, it is used as a governance indicator in this study, which is in line with Edwards (1990) and Chakrabarti (2001). $CRIS^A$ represents the Asian Financial Crisis, taking the value of 1 during the period 1998–1999 for countries affected. FTA_{vit} is the key variable, getting the value of 1 if Vietnam and country partner i have participated into an FTA (date of entry into force), and 0 otherwise. Following Bae and Jang (2013) who note that FTAs' entry into force tend to drive FDI heightening economic and political collaboration among countries, the dates of entry into force are used. Finally, $\varepsilon_{ivt} = \alpha_{vi} + v_{vit}$. While α_{vi} denotes the specific country-pair effect that accounts for the unobservable and time-invariant characteristics that are specific to each pair of countries, v_{vit} represents the error term that is assumed to be log normally distributed. The descriptive statistics for these variables are shown in Appendix, Tables A1 and A2.

5.2. Data

This study employs panel data comprising Vietnam and its 17 country partners over the 1997–2016 period. Based on Vietnam's main FDI partners and the availability of

the data, the 17 partners selected include Indonesia, Malaysia, Singapore, Thailand, China, Japan, Korea, Canada, US, Hong Kong, Taiwan, France, Germany, Italy, Netherland, United Kingdom, and Sweden. During the last two decades, from 1995 to 2016, these 17 partners have accounted for almost 84% of Vietnam's total inward FDI. Indeed, in 2016 at the end of the study period, FDI flows into Vietnam from these partners contributed 83% of Vietnam's FDI inflows.

We also include a sub-period spanning from 2005 to 2016 with Vietnam's 23 trading partners due to three reasons. Firstly, AFTA was Vietnam's first FTA, and it took almost ten years before Vietnam had its second FTA (ASEAN-China FTA), at the end of 2004. Since then, Vietnam has participated in a variety of FTAs. Secondly, Brunei, India, Australia, Denmark, Belgium and Luxembourg have become Vietnam's significant FDI partners in this sub-period and this change in partners should be accounted for. Furthermore, the 2005–2016 period has experienced dramatic increases in Vietnam's FDI inflows.

FDI flows into Vietnam by source countries are obtained from the ASEAN Secretariat while Vietnam's imports from its partners are collected from the General Statistics Office of Vietnam (GSO). The nominal variables are then converted into constant prices using consumer price indices.

The bilateral real exchange rate data between Vietnam and its partners are not directly available. Following Duong et al. (2019), they are calculated as follows:

$$\text{rER}_{vit} = (\text{CPI}_{it}/\text{CPI}_{vt}) * (\text{nER}_{vt/\$}/\text{nER}_{it/\$})$$

where CPI_{it}, CPI_{vt} are the annual consumer price index of country i and Vietnam at year t, respectively. $\text{nER}_{vt/\$}$ and $\text{nER}_{it/\$}$ are the nominal exchange rates, indicating the amount of each country's currency per 1 $US at year t. CPI and nominal exchange rate data for Taiwan are from the National Statistics Republic of China and the Federal Reserve Bank of St. Louis, respectively, whereas the data for others are from the World Bank's World Development Indicators.

Real GDP and population data are sourced from the World Development Indicators of the World Bank except for Taiwan whose data are collected from the IMF. Political stability and absence of violence index is from the World Development Indicators, ranging from -2.5 (weak) to 2.5 (strong) for governance performance. Human capital (percentage of Vietnamese students in its total population) is from the General Statistical Office of Vietnam. The length of railways (a proxy for infrastructure) is from the World Development Indicators. Information on Vietnam's FTAs are from the World Trade Organization, whereas data on distance and border are from Centre d'Études Prospectives et d'Informations Internationales (CEPII).

5.3. Methodology

We start with panel data unit root tests based on Levin, Lin, and Chu (2002). The null of joint non-stationarity is rejected for some panel series, but not others (Appendix, final columns of Tables A1 and A2). This might suggest that a panel cointegration approach, which is usually applied in the case of all non-stationary panel series, is not appropriate.

Table 4. Estimation results for FDI inflows to Vietnam, 1997–2016.

Variables	OLS	FE	RE
ln GDP_{vt-1}	−0.548	−0.402	−0.063
	(1.107)	(2.447)	(0.623)
ln GDP_{it-1}	0.324***	1.216	0.705*
	(0.119)	(2.624)	(0.421)
ln DIS_{vi}	−1.108***	–	−1.927***
	(0.211)	–	(0.503)
ln rER_{vit-1}	0.120***	0.156*	0.138**
	(0.043)	(0.089)	(0.070)
ln $rIMP_{ivt-1}$	0.807***	0.340	0.392**
	(0.111)	(0.198)	(0.188)
ln $DIFF_{vit-1}$	−0.840***	−0.688	−1.062***
	(0.148)	(2.768)	(0.279)
ln $INFRA_{vt-1}$	2.471**	2.298***	2.306***
	(1.149)	(0.548)	(0.566)
HC_{vt-1}	0.859	0.985*	0.976**
	(0.840)	(0.462)	(0.439)
FTA	0.443**	0.840***	0.827***
	(0.192)	(0.258)	(0.172)
CRISA	0.207	0.257	0.238
	(0.263)	(0.245)	(0.236)
$POLITI_{vt-1}$	1.821*	1.757***	1.760***
	(0.948)	(0.515)	(0.516)
BOR	−0.712	–	−0.716
	(0.474)	–	(1.007)
Constant	−9.653	−36.376**	−16.781
	(23.455)	(15.000)	(13.350)
Breusch-Pagan LM test			643.68***
Hausman test			1.22
Wald test statistics			240.13***
Wooldridge test, F			4.90*
Number of observations			340

Notes: ***, **, *: significance levels at 1%, 5%, and 10%, respectively.
White robust standard errors are in parentheses.

As a panel dataset is used, panel estimators, such as ordinary least squares (OLS), fixed effects (FE), and random effects (RE) methods can be employed.[5] First, based on Wald statistics for groupwise heteroscedasticity, we test whether there is the presence of heteroscedasticity across panel data for the whole period and sub-period. The Wald tests, as reported in Tables 4 and 5, reject the null hypothesis that the variance of the disturbance term in each model is constant over time. To address the issue, the White-adjusted robust standard errors are used. Next, we check the serial correlation for the models in the two periods. The Wooldridge test suggests that there is no serial correlation in the idiosyncratic error term in the sub-period model, while it indicates that autocorrelation exists in the whole period model. To deal with the problem of autocorrelation, generalised least squares (GLS) should be used (Barreto and Howland 2005; Wooldridge 2012). Then, multicollinearity is checked using correlation matrices. The low correlation coefficients among the explanatory variables indicate that multicollinearity is not a major problem in this study (Appendix, Tables A3 and A4).[6] Finally, we utilise the Hausman's specification test (FE vs. RE) and the Breusch and Pagan LM test (OLS vs. RE) to determine the preferred estimator for each model.

In terms of dynamic panel data, the difference generalised method of moments (GMM) estimator (Arellano and Bond 1991) and the system GMM estimator

Table 5. Estimation results for FDI inflows to Vietnam, 2005–2016.

Variables	OLS (1)	FE (2)	RE (3)	RE (4)
ln GDP_{vt-1}	1.421	1.973	1.482*	1.711**
	(1.077)	(3.670)	(0.766)	(0.755)
ln GDP_{it-1}	0.746***	3.063	0.873***	0.833***
	(0.163)	(3.071)	(0.273)	(0.236)
ln DIS_{vi}	−2.228***	–	−2.462***	−2.693***
	(0.271)	–	(0.462)	(0.483)
ln rER_{vit-1}	0.028	3.858**	0.066	0.215
	(0.052)	(1.544)	(0.123)	(0.183)
ln $rIMP_{ivt-1}$	0.140	0.110	0.120*	0.094
	(0.089)	(0.084)	(0.069)	(0.060)
ln $DIFF_{vit-1}$	−1.548***	0.851	−1.661***	−1.816***
	(0.292)	(2.907)	(0.225)	(0.205)
ln $INFRA_{vt-1}$	2.839**	2.981***	2.837***	2.760***
	(1.274)	(1.032)	(1.036)	(1.069)
HC_{vt-1}	0.772	0.286	0.755	0.221
	(1.072)	(0.798)	(0.747)	(0.877)
FTA	1.149***	1.022**	1.240***	1.138
	(0.386)	(0.491)	(0.467)	(0.979)
$POLITI_{vt-1}$	2.501	2.422*	2.495*	2.487*
	(1.522)	(1.353)	(1.351)	(1.402)
BOR	0.125		−0.078	−0.068
	(0.477)		(0.801)	(0.663)
FTA* ln $DIFF_{vit-1}$				0.419***
				(0.063)
FTA*HC				1.323**
				(0.664)
FTA*ln rER_{vit-1}				−0.182*
				(0.110)
Constant	−52.566*	−172.408***	−55.865***	−58.324***
	(26.658)	(49.483)	(20.297)	(19.400)
Breusch-Pagan LM			101.97***	102.44***
Hausman test			9.13	6.78
Wald test statistics			2,195.84***	2,420.94***
Wooldridge test, F			2.652	2.633
No. of obser.			276	276

Notes: ***, **, *: significance levels at 1%, 5%, and 10%, respectively.
White robust standard errors are in parentheses.

(Blundell and Bond 1998) have been increasingly applied to studies on FDI analysis (Kahouli and Omri 2017; Mijiyawa 2017; Saini and Singhania 2018; Ullah and Khan 2017). However, it is well-known that GMM estimator is efficient for panels with small or moderate time points (T) and large cross-section units (N), which is not the case for the whole period (T = 20 > N = 17). In this respect, large T may lead to inconsistent GMM estimators (Han and Phillips 2010). In the sub-period, we have N > T. However, the GMM technique is still inapplicable because the data do not meet the requirements of GMM estimation.[7] Therefore, the GMM estimator is not an alternative to estimate the panel data in this study.

6. Empirical results

We estimate two separate regressions, allowing us to compare and contrast the findings. The first regression includes data for the whole period, whereas the second regression is restricted to the more recent data with Vietnam's additional FDI partners included.

The estimated results for the whole period, from 1997 to 2016, are shown in Table 4 using OLS, FE and RE methods. The LM statistic (643.68) of the Breusch and Pagan LM test (RE vs. FE), is significant at 1 percent, suggesting that RE model is superior to the OLS model. In addition, the test statistic (1.22) of the Hausman's specification test (FE vs. RE) indicates that RE model is preferable to FE model. We therefore focus on the estimated results based on RE estimation reported in the fourth column. We begin with a discussion of the impacts from the control variables before focussing on our main variable, related to FTAs.

Home country market size positively affects FDI inflows to Vietnam, with an elasticity of 0.71. Vietnam's market size, however, has no significant effects on inward FDI. Although this seems to contrast with the literature showing that host country market size is a driver of FDI, this finding reflects the fact that source country market size is much larger than the size of the Vietnamese market. Therefore, overseas investors may not base on Vietnam's market size to determine whether they invest in Vietnam or not.

The significantly positive estimated elasticity of FDI inflows with respect to the real exchange rate between Vietnam and its partners suggests that a depreciation of Vietnamese currency is attributed to enhanced FDI flows. Foreign investors benefit from a weak host country currency as they receive a larger investment (Blonigen 2005; Feils and Rahman 2011). However, inward FDI responds negatively to the distance between Vietnam's capital and its partners' capitals. Greater geographic distance between two countries results in less FDI due to increased costs such as transportation, transaction and management costs. Regarding locational advantages of Vietnam including quality of capital (HC), infrastructure (INFRA) and political stability (POLITI), these are found to be associated with increased FDI flows.

With regards to the relationship between trade and FDI, the elasticity of FDI inflows with respect to imports by Vietnam from partners is 0.39 and significant at 5%, underlining a complementarity between them (Lipsey and Weiss 1981; Markusen 1984). This is partly because MNEs need intermediate inputs and services from headquarters in their home countries (De Mello and Fukasaku 2000). We can further infer that vertical FDI seems to dominate FDI flows into Vietnam because the increase in imports by Vietnam from partners (or exports from partners to Vietnam) does not reduce FDI flows from partners to Vietnam.

In terms of factor endowments, the DIFFvit-1 coefficient carries a negative sign as expected and is significant at the 1% level, with a 1% increase in DIFFvit-1 resulting in a 1.06% decrease in Vietnam's FDI inflows. An increase in the ratio of GDP per capita of Vietnam to GDP per capita of country partner i (ln DIFFvit-1) indicates a decreased difference in factor endowments between Vietnam and its partners. In other words, Vietnam's factor endowments have become relatively more expensive. Therefore, vertical FDI, which has been motivated by cheaper factor endowments, tends to decrease. This decrease, in turn, reduces FDI flows to Vietnam. This finding also supports the dominance of vertical FDI over horizontal FDI flows in Vietnam. This is in agreement with Bae and Jang (2013), who find that a smaller gap of GDP per capita between Korea and its developed partners decreases FDI flows from these partners into Korea. In contrast, for the dominance of horizontal FDI in total FDI,

Hattari and Rajan (2008) find that the smaller the income divergence between the host and source countries, the larger will be bilateral FDI flows between them.

FTAs, the main focus area of our study, are found to be associated with increased FDI flows to Vietnam, on average, of 129% (exp(0.827)-1). This finding is consistent with positive impacts of the ASEAN-Korea FTA and the Japan-Vietnam FTA on FDI flows in Vietnam (Le 2017), investment creation in China and ASEAN-6 following the ASEAN-China FTA (Li, Scollay, and Gilbert 2017), and significant increase in FDI flows to Brunei, Laos, Myanmar and Vietnam from original ASEAN members as a result of the AFTA (Ismail, Smith, and Kugler 2009). Although there is evidence of investment diversion of the AFTA and the ASEAN-Australia-New Zealand FTA in Vietnam (Hoang et al. 2013), our results show that FTAs, in general, are significantly beneficial to Vietnam in terms of enhanced FDI flows. This increase is largely due to the prevalence of vertical FDI. A more friendly-FDI environment following FTAs also contributes to the positive change in Vietnam's inward FDI.

Table 5 reports the results for the sub-period between 2005 and 2016. We estimate the gravity model using OLS, FE, and RE methods. Similarly, both the Breusch-Pagan LM test (RE vs. OLS) and the Hausman test (RE vs. FE) suggest that RE should be used. As most of Vietnam's FTAs entered into force in this sub-period, we also examine whether foreign investors' sensitivity to key determinants of FDI has changed following FTAs. Therefore, we base on RE (3) and RE (4) for the result explanation.

As shown in Table 5, the signs and significance of most of the estimated coefficients for the sub-period remain unchanged. However, Vietnam's market size has become an important determinant of FDI. One possible reason is that Vietnam has experienced significantly decreased gaps between the GDP of Vietnam and its partners since 2005, which may make the market size of Vietnam more important.

Consistent with the outcome for the whole period, FTAs are also found to stimulate FDI flows. As expected, the impact of FTAs is much stronger in this sub-period, increasing FDI inflows to Vietnam by 246% (exp(1.240)-1). Therefore, there has been a significant role for FTAs in attracting FDI. In addition, in this FTA period, the effect of FTAs on FDI flows instead works interactively through DIFF, HC, and rER, as shown in (4).

Regarding the interaction terms FTA*ln rER_{vit-1}, the sub-period has seen FDI and the real exchange rate becoming negatively related following FTAs, with a more important role of the real exchange rate. The negative sign on the FTA*ln rER_{vit-1} suggests that a real exchange rate depreciation leads to a fall in FDI. This outcome is opposite to the finding in Table 4 and the general literature as well. However, this result may be partly explained by the Vietnamese nominal exchange rate (VND/ 1US$), a component used in calculations of the real exchange rate in this study. The nominal exchange rate in Vietnam has experienced substantial fluctuations since 2008, with a depreciating trend of the VND against the US dollar between 2009 and 2011 (Le et al. 2016), and a variety of adjustments from the State Bank of Vietnam, especially in the exchange rate band. In addition, the habit of keeping US dollars, either as a hedge against inflation or with expectations of a depreciation in VND against US$, leads to an artificial demand for US dollars and generates pressures on the nominal exchange rate (State Bank of Vietnam 2015). Although a nominal

exchange rate depreciation benefits foreign investors, high volatility in the exchange rate may reduce the confidence of overseas investors. As most of the FTAs Vietnam has made coming into force in the period with significant fluctuations in the nominal exchange rate, it is understandable that foreign investors, especially from FTA partners, may be more cautious and respond negatively to changes in the Vietnamese nominal exchange rate and the real exchange rate between Vietnam and its partners as well.

The FTA*HC coefficient is positive and statistically significant at 5%. The results are in line with Yeyati, Stein, and Daude (2003), who interact FTA dummy with human capital (proportion of the labour force with complete secondary education) and find the positive impact of the interaction on FDI flows. Our finding shows that human capital has become more important as a driver of FDI following the FTAs. For instance, Samsung Electronics from South Korea has surpassed the Petro Vietnam, a state-owned enterprise, to be the largest firm in Vietnam. For Samsung, Vietnam has become an attractive alternative to China due to not only younger labour force and cheaper labour costs, but improvement of quality of labour as well.

Consistent with Yeyati, Stein, and Daude (2003) and Bae and Jang (2013), we include the interaction term between FTA dummy and relative factor endowments, FTA* ln DIFFvit-1. If FDI is more likely to be vertical FDI, then we expect the impact of the FTAs on FDI flows to be large. The FTA* ln DIFFvit-1 coefficient is significantly positive as expected. This finding is in line with Bae and Jang (2013), who also find a positive impact from this kind of interaction term on FDI inflows to Korea where Korea's partners have higher GDP per capita than Korea. This result, together with the consistent findings for FTAs, trade, and factor endowments in both the whole period and sub-period, strongly suggest the prevalence of vertical FDI in Vietnam.

7. Conclusion and recommendations

The impact of FTAs on FDI has been ambiguous in the literature to date. Whether FTAs, in general, promote FDI inflows in a developed country, such as Australia and South Korea, has been evaluated. Our study focuses on Vietnam to provide evidence on the effect of the overall FTAs on FDI flows in a developing country. Panel regression results indicate that the overall FTAs have substantially stimulated FDI inflows to Vietnam in the whole period, with a much stronger impact in the later sub-period. This indicates that FTAs have become efficient drivers of Vietnam's inward FDI. Therefore, the more Vietnam's involvement in economic integration through FTAs, the more likely it is to induce FDI inflows, suggesting the importance of further FTA negotiations. This result, along with the outcomes for trade, factor endowments, and the interaction term between FTAs and factor endowments, suggests the dominance of vertical FDI in Vietnam, which is consistent with the theoretical reasoning indicating that vertical FDI is more prevalent in developing countries.

We also examine whether the FTAs result in any changes in foreign investors' sensitivity to the key determinants of FDI in the sub-period. We find that the real exchange rate, human capital, and factor endowments become more important as

drivers of FDI following the FTAs. These findings have important implications for Vietnam's policy makers. In addition to relatively cheaper labour costs as Vietnam's locational advantages, Vietnam should continue to develop human capital. Furthermore, maintaining stability of the exchange rate appears important to enhance overseas investors' confidence.

As factor endowments are found to be associated with increased FDI inflows into Vietnam, future research might explore threshold effects of factor endowments on inward FDI in an extended study on the ASEAN, such as ASEAN-6. Given that the real exchange rate has a more important role on FDI flows in Vietnam following FTAs, another avenue for future research might be to more closely explore the linkage between them. Furthermore, this study could not account for Vietnam's involvement in recent mega-FTAs, such as the CPTPP, RCEP, and EU-Vietnam FTA, which cover most of Vietnam's main FDI partners. Future research might look at how these FTAs impact on Vietnam's total and sectoral FDI.

Notes

1. Calculated from Balance of Payments and International Investment Position Statistics, IMF, accessed at http://data.imf.org
2. The foreign invested sector refers to enterprises in which foreign ownership accounts for at least a 51 percent threshold, as stated in the 2014 Law on Investment in Vietnam, accessed at the website of Ministry of Justice of Vietnam http://www.moj.gov.vn
3. The gravity model was first adopted by Tinbergen (1962) and Pöyhönen (1963) in trade analysis.
4. Also see Crotti, Cavoli, and Wilson (2010) and Nguyen and Xing (2008) who use lagged independent variables to avoid the problem of endogeneity.
5. In considering estimation, it should be noted that there are only two zero FDI observations in the later sub-period. Therefore, following Crotti, Cavoli, and Wilson (2010), Ullah and Inaba (2014), and Thangavelu and Narjoko (2014), a value of 1 is added to each of the FDI observation ahead of the logarithmic transformation.
6. We find that ln GDP (Vietnam) and HC (Vietnam) are highly correlated. While the former is a key component of the gravity model, the latter is statistically significant in the 1997–2016 period and becomes more important following FTAs in the later sub-period. Therefore, both are included in our models.
7. Two conditions need to be met for the application of the GMM (Kahouli and Omri 2017). First, the differenced error term should be serially correlated at the first order, but no autocorrelation at the second order. Second, based on Sargan/Hansen test of over-identifying restrictions, the instruments and the error term need to be uncorrelated.
8. https://asean.org/.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

My Duong is an economic lecturer at Hue College of Economics-Hue University, Vietnam. She holds Master Degree in Economics from Murray State University, the United States. She has successfully defended her PhD thesis in Economics at Waikato Management School,

University of Waikato, New Zealand. Her latest publication relates to her research interests in foreign direct investment, free trade agreements and trade flows.

Mark J. Holmes is professor of economics at Waikato Management School, University of Waikato, New Zealand. He has previously served as President of the New Zealand of Association of Economists and as Editor-in-Chief of New Zealand Economic Papers. His research interests include applied macroeconomics and international finance. Recent publications include studies of inflation targeting, productivity, current account sustainability and house price convergence.

Anna Strutt is professor of economics at Waikato Management School, University of Waikato, New Zealand. She has contributed to many national and international research projects, working with a range of international organisations, including the Asian Development Bank and the World Bank. Her research interests include CGE modelling and international trade reform. Recent publications focus on international trade and policy reform.

References

Aizenman, J., and I. Noy. 2006. "FDI and Trade—Two-Way Linkages?" *The Quarterly Review of Economics and Finance* 46 (3): 317–337. doi:10.1016/j.qref.2006.02.004.

Anwar, S., and L. P. Nguyen. 2010. "Foreign Direct Investment and Economic Growth in Vietnam." *Asia Pacific Business Review* 16 (1-2): 183–202. doi:10.1080/10438590802511031.

Anwar, S., and L. P. Nguyen. 2011. "Foreign Direct Investment and Trade: The Case of Vietnam." *Research in International Business and Finance* 25 (1): 39–52. doi:10.1016/j.ribaf.2010.05.004.

Arellano, M., and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *The Review of Economic Studies* 58 (2): 277–297. doi:10.2307/2297968.

ASEAN Secretariat. 2017. *ASEAN Investment Report 2017*. Jakarta: ASEAN Secretariat

ASEAN Secretariat. 2019. *Foreign Direct Investment Statistics.* https://data.aseanstats.org/

Athukorala, P.-C, and Q. T. Tran. 2012. "Foreign Direct Investment in Industrial Transition: The Experience of Vietnam." *Journal of the Asia Pacific Economy* 17 (3): 446–463. doi:10.1080/13547860.2012.694699.

Bae, C., and Y. J. Jang. 2013. "The Impact of Free Trade Agreements on Foreign Direct Investment: The Case of Korea." *East Asian Economic Review* 17 (4): 417–445. doi:10.11644/KIEP.JEAI.2013.17.4.272.

Barreto, H., and F. Howland. 2005. *Introductory Econometrics: Using Monte Carlo Simulation with Microsoft Excel*. New York: Cambridge University Press.

Bellak, C., M. Leibrecht, and J. P. Damijan. 2009. "Infrastructure Endowment and Corporate Income Taxes as Determinants of Foreign Direct Investment in Central and Eastern European Countries." *World Economy* 32 (2): 267–290. doi:10.1111/j.1467-9701.2008.01144.x.

Bevan, A. A., and S. Estrin. 2004. "The Determinants of Foreign Direct Investment into European Transition Economies." *Journal of Comparative Economics* 32 (4): 775–787. doi:10.1016/j.jce.2004.08.006.

Blomstrom, M., and A. Kokko. 1997. *Regional Integration and Foreign Direct Investment*. Cambridge: National Bureau of Economic Research, Inc.

Blonigen, B. A. 2005. "A Review of the Empirical Literature on FDI Determinants." *Atlantic Economic Journal* 33 (4): 383–403. doi:10.1007/s11293-005-2868-9.

Blundell, R., and S. Bond. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87 (1): 115–143. doi:10.1016/S0304-4076(98)00009-8.

Brainard, S. L. 1993. *An Empirical Assessment of the Proximity-Concentration Tradeoff between Multinational Sales and Trade*. Cambridge: National Bureau of Economic Research, Inc.

Brainard, S. L. 1997. "An Empirical Assessment of the Proximity-Concentration Trade-off between Multinational Sales and Trade." *The American Economic Review* 87 (4): 520–544.

Brenton, P., F. Di Mauro, and M. Lücke. 1999. "Economic Integration and FDI: An Empirical Analysis of Foreign Investment in the EU and in Central and Eastern Europe." *Empirica* 26 (2): 95–121. doi:10.1023/A:1007006429600.

Breu, M., R. Dobbs, J. Remes, D. Skilling, and J. Kim. 2012. *Sustaining Vietnam's Growth: The Productivity Challenge*. Washington, DC: McKinsey Global Institute

Buckley, P. J., J. Clagg, N. Forsans, and K. T. Reilly. 2001. "Increasing the Size of the "Country": Regional Economic Integration and Foreign Direct Investment in a Globalised World Economy." *Management International Review* 41 (3): 251–274.

Carr, D. L., J. R. Markusen, and K. E. Maskus. 2001. "Estimating the Knowledge-Capital Model of the Multinational Enterprise." *American Economic Review* 91 (3): 693–708. doi:10.1257/aer.91.3.693.

Chakrabarti, A. 2001. "The Determinants of Foreign Direct Investments: Sensitivity Analyses of Cross-Country Regressions." *Kyklos* 54 (1): 89–114. doi:10.1111/1467-6435.00142.

Crotti, S., T. Cavoli, and J. K. Wilson. 2010. "The Impact of Trade and Investment Agreements on Australia's Inward FDI Flows." *Australian Economic Papers* 49 (4): 259–275. doi:10.1111/j.1467-8454.2010.00401.x.

De Mello, L. R., Jr, and K. Fukasaku. 2000. "Trade and Foreign Direct Investment in Latin America and Southeast Asia: Temporal Causality Analysis." *Journal of International Development* 12 (7): 903–924. doi:10.1002/1099-1328(200010)12:7<903::AID-JID695>3.0.CO;2-8.

Dee, P., and J. Gali. 2003. *The Trade and Investment Effects of Preferential Trading Arrangements*. Cambridge: National Bureau of Economic Research, Inc.

Dunning, J. H. 1981. *International Production and the Multinational Enterprise*. London: George Allen & Unwin Ltd.

Dunning, J. H. 1997. "The European Internal Market Programme and Inbound Foreign Direct Investment." *JCMS: Journal of Common Market Studies* 35 (2): 189–223. doi:10.1111/j.1468-5965.1996.tb00593.x.

Duong, M., M. J. Holmes, A. Strutt, and S. Lim. 2019. "Effects of Trade Agreements and Foreign Direct Investment on Trade: Evidence from Vietnam." *International Journal of Economics and Financial Issues* 9 (3): 116–126. doi:10.32479/ijefi.7767.

Edwards, S. 1990. *Capital Flows, Foreign Direct Investment, and Debt-Equity Swaps in Developing Countries*. Cambridge: National Bureau of Economic Research, Inc

Egger, P., and H. Winner. 2005. "Evidence on Corruption as an Incentive for Foreign Direct Investment." *European Journal of Political Economy* 21 (4): 932–952. doi:10.1016/j.ejpoleco.2005.01.002.

Faeth, I. 2009. "Determinants of Foreign Direct Investment–A Tale of Nine Theoretical Models." *Journal of Economic Surveys* 23 (1): 165–196. doi:10.1111/j.1467-6419.2008.00560.x.

Feils, D. J., and M. Rahman. 2008. "Regional Economic Integration and Foreign Direct Investment: The Case of NAFTA." *Management International Review* 48 (2): 147–163. doi:10.1007/s11575-008-0009-9.

Feils, D. J., and M. Rahman. 2011. "The Impact of Regional Integration on Insider and Outsider FDI." *Management International Review* 51 (1): 41–63. doi:10.1007/s11575-010-0062-z.

Globerman, S. 2002. "Trade, FDI and Regional Economic Integration: Cases of North America and Europe." Paper presented at the Enhancing Investment Cooperation in Northeast Asia conference, Honolulu, August 8–9.

GSO. 2018. "Trade, Price and Tourist." http://www.gso.gov.vn/default_en.aspx?tabid=780

Han, C., and P. C. Phillips. 2010. "GMM Estimation for Dynamic Panels with Fixed Effects and Strong Instruments at Unity." *Econometric Theory* 26 (1): 119–151. doi:10.1017/S026646660909063X.

Hattari, R., and R. S. Rajan. 2008. *Trends and Drivers of Bilateral FDI Flows in Developing Asia*. Hong Kong Institute for Monetary Research Working Paper.

Hejazi, W., and A. Safarian. 2005. "NAFTA Effects and the Level of Development." *Journal of Business Research* 58 (12): 1741–1749. doi:10.1016/j.jbusres.2004.09.002.

Hoang, C., N. Do, M. Bui, and L. Dang. 2013. "Trade Liberalization and Foreign Direct Investment in Viet Nam: A Gravity Model Using Hausman-Taylor Estimator Approach." *Science and Development* 11 (1): 85–96.

Hoang, H. H., and M. Goujon. 2014. "Determinants of Foreign Direct Investment in Vietnamese Provinces: A Spatial Econometric Analysis." *Post-Communist Economies* 26 (1): 103–121. doi:10.1080/14631377.2014.874658.

Horstmann, I., and J. R. Markusen. 1987. "Licensing versus Direct Investment: A Model of Internalization by the Multinational Enterprise." *The Canadian Journal of Economics* 20 (3): 464. doi:10.2307/135389.

Ismail, N. W., P. Smith, and M. Kugler. 2009. "The Effect of ASEAN Economic Integration on Foreign Direct Investment." *Journal of Economic Integration* 24 (3): 385–407. doi:10.11130/jei.2009.24.3.385.

Jang, Y. J. 2011. "The Impact of Bilateral Free Trade Agreements on Bilateral Foreign Direct Investment among Developed Countries." *The World Economy* 34 (9): 1628–1651. doi:10.1111/j.1467-9701.2011.01356.x.

Kahouli, B., and A. Omri. 2017. "Foreign Direct Investment, Foreign Trade and Environment: New Evidence from Simultaneous-Equation System of Gravity Models." *Research in International Business and Finance* 42: 353–364. doi:10.1016/j.ribaf.2017.07.161.

Le, H. Q., and R. Pomfret. 2011. "Technology Spillovers from Foreign Direct Investment in Vietnam: Horizontal or Vertical Spillovers?" *Journal of the Asia Pacific Economy* 16 (2): 183–201. doi:10.1080/13547860.2011.564746.

Le, P. L., T. H. L. Ngo, L. H. A. Tran, H. D. H. Truong, T. T. H. Can, T. K. C. Vu, and T. H. Nguyen. 2016. "Household Debt in Vietnam: An overview." Household Debt in SEACEN Economies. https://www.seacen.org/publications/RStudies/2018/RP102/8-VietnamHouseholddebt.pdf

Le, T. H. 2017. "Does Economic Distance Affect the Flows of Trade and Foreign Direct Investment? Evidence from Vietnam." *Cogent Economics & Finance* 5 (1): 1403108. doi:10.1080/23322039.2017.1403108.

Lederman, D., W. F. Maloney, and L. Serven. 2003. *Lessons from NAFTA for Latin American and Caribbean Countries: A Summary of Research Findings*. Washington, DC: The World Bank.

Levin, A., C. F. Lin, and C. S. Chu. 2002. "Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties." *Journal of Econometrics* 108 (1): 1–24. doi:10.1016/S0304-4076(01)00098-7.

Li, Q., R. Scollay, and J. Gilbert. 2017. "Analyzing the Effects of the Regional Comprehensive Economic Partnership on FDI in a CGE Framework with Firm Heterogeneity." *Economic Modelling* 67: 409–420. doi:10.1016/j.econmod.2017.07.016.

Lipsey, R. E., and M. Y. Weiss. 1981. "Foreign Production and Exports in Manufacturing Industries." *The Review of Economics and Statistics* 63 (4): 488–494. doi:10.2307/1935843.

MacDermott, R. 2007. "Regional Trade Agreement and Foreign Direct Investment." *The North American Journal of Economics and Finance* 18 (1): 107–116. doi:10.1016/j.najef.2006.09.004.

Markusen, J. R. 1984. "Multinationals, Multi-Plant Economies, and the Gains from Trade." *Journal of International Economics* 16 (3-4): 205–226. doi:10.1016/S0022-1996(84)80001-X.

Markusen, J. R. 1997. *Trade versus Investment Liberalization* (Working Paper No. 6231). Cambridge, MA: National Bureau of Economic Research. doi:10.1086/ahr/58.2.398.

Markusen, J. R., and A. J. Venables. 2000. "The Theory of Endowment, Intra-Industry and Multi-National Trade." *Journal of International Economics* 52 (2): 209–234. doi:10.1016/S0022-1996(99)00055-0.

Markusen, J. R., A. J. Venables, D. K. Eby, and K. H. Zhang. 1996. *A Unified Treatment of Horizontal Direct Investment, Vertical Direct Investment, and the Pattern of Trade in Goods and Services*. (Working Paper No.5696). Cambridge, MA: National Bureau of Economic Research.

Medvedev, D. 2012. "Beyond Trade: The Impact of Preferential Trade Agreements on FDI Inflows." *World Development* 40 (1): 49–61. doi:10.1016/j.worlddev.2011.04.036.

Mijiyawa, A. G. 2017. "Does Foreign Direct Investment Promote Exports? Evidence from African Countries." *The World Economy* 40 (9): 1934–1957. doi:10.1111/twec.12465.

Nguyen, N. B., and J. Haughton. 2002. "Trade Liberalization and Foreign Direct Investment in Vietnam." *ASEAN Economic Bulletin* 19 (3): 302–318. doi:10.1355/AE19-3E.

Nguyen, T. X., and Y. Xing. 2008. "Foreign Direct Investment and Exports." *The Economics of Transition* 16 (2): 183–197. doi:10.1111/j.1468-0351.2008.00321.x.

Park, I., and S. Park. 2008. "Reform Creating Regional Trade Agreements and Foreign Direct Investment: Applications for East Asia." *Pacific Economic Review* 13 (5): 550–566. doi:10.1111/j.1468-0106.2008.00418.x.

Pham, H. M. 2002. "Regional Economic Development and Foreign Direct Investment Flows in Vietnam, 1988-98." *Journal of the Asia Pacific Economy* 7 (2): 182–202.

Pham, T. H. H., and T. D. Nguyen. 2013. "Foreign Direct Investment, Exports and Real Exchange Rate Linkages in Vietnam: Evidence from a co-Integration Approach." *Southeast Asian Economies* 30 (3): 250–262. doi:10.1355/ae30-3b.

Pöyhönen, P. 1963. "A Tentative Model for the Volume of Trade between Countries." *Weltwirtschaftliches Archiv* 90 (1): 93–100.

Saini, N., and M. Singhania. 2018. "Determinants of FDI in Developed and Developing Countries: A Quantitative Analysis Using GMM." *Journal of Economic Studies* 45 (2): 348–382. doi:10.1108/JES-07-2016-0138.

Schaumburg-Müller, H. 2003. "Rise and Fall of Foreign Direct Investment in Vietnam and Its Impact on Local Manufacturing Upgrading." *The European Journal of Development Research* 15 (2): 44–66. doi:10.1080/09578810312331287475.

State Bank of Vietnam. 2015. "Outstanding Achievements in the Foreign Exchange Policy between 2011 and 2015." https://www.sbv.gov.vn

Te Velde, D. W., and D. Bezemer. 2006. "Regional Integration and Foreign Direct Investment in Developing Countries." *Transnational Corporations* 15 (2): 41–70.

Thangavelu, S. M., and D. Narjoko. 2014. "Human Capital, FTAs and Foreign Direct Investment Flows into ASEAN." *Journal of Asian Economics* 35: 65–76. doi:10.1016/j.asieco.2014.11.002.

Tinbergen, J. 1962. *Shaping the World Economy: Suggestions for an International Trade Policy.* New York: Twentieth Century Fund Press.

Tran, V. T. 2013. "Vietnamese Economy at the Crossroads: New Doi Moi for Sustained Growth." *Asian Economic Policy Review* 8 (1): 122–143. doi:10.1111/aepr.12012.

Ullah, I., and M. A. Khan. 2017. "Institutional Quality and Foreign Direct Investment Inflows: Evidence from Asian Countries." *Journal of Economic Studies* 44 (6): 1030–1050. doi:10.1108/JES-10-2016-0215.

Ullah, M. S., and K. Inaba. 2014. "Liberalization and FDI Performance: Evidence from ASEAN and SAFTA Member Countries." *Journal of Economic Structures* 3 (1): 1–24. doi:10.1186/s40008-014-0006-z.

UNCTAD. 2010. *World Investment Prospects Survey 2007-2009.* Geneva: United Nations.

UNCTAD. 2015. *Global Investment Trends Monitor.* Geneva: United Nations.

UNCTAD. 2018. *World Investment Report 2018.* Geneva: United Nations.

Vu, T. B., B. Gangnes, and I. Noy. 2008. "Is Foreign Direct Investment Good for Growth? Evidence from Sectoral Analysis of China and Vietnam." *Journal of the Asia Pacific Economy* 13 (4): 542–562. doi:10.1080/13547860802364976.

Waldkirch, A. 2003. "The 'New Regionalism'and Foreign Direct Investment: The Case of Mexico." *The Journal of International Trade & Economic Development* 12 (2): 151–184. doi:10.1080/0963819032000084313.

Waldkirch, A. 2010. "The Effects of Foreign Direct Investment in Mexico since NAFTA. The." *World Economy* 33 (5): 710–745. doi:10.1111/j.1467-9701.2009.01244.x.

Wooldridge, J. M. 2012. *Introductory Econometrics: A Modern Approach.* 5th ed. Mason, OH: South-Western, Cengage Learning.

WTO. 2019. "Regional Trade Agreements." https://www.wto.org/

Xaypanya, P., P. Rangkakulnuwat, and S. W. Paweenawat. 2015. "The Determinants of Foreign Direct Investment in ASEAN: The First Differencing Panel Data Analysis." *International Journal of Social Economics* 42 (3): 239–250. doi:10.1108/IJSE-10-2013-0238.

Yeyati, E. L., E. Stein, and C. Daude. 2003. *Regional Integration and the Location of FDI.* Washington, DC: Inter-American Development Bank.

Appendix

Table A1. Descriptive statistics, 1997–2016.

Variables	Mean	Std. Dev.	Min	Max	Unit root test (*p*-value)
ln rFDI	17.87	2.18	9.94	21.94	0.006*
ln GDP (Vietnam)	25.19	0.36	24.59	25.76	0.496
ln GDP (Partners)	27.68	1.28	25.42	30.44	0.052
ln DIS	8.33	0.87	6.77	9.50	–
ln rER	7.81	2.76	−0.01	10.70	0.145
ln rIMP	20.73	1.46	17.29	24.42	0.059
ln DIFF	−3.04	1.01	−4.20	−0.76	0.429
ln INFRA	7.88	0.09	7.76	8.07	0.988
HC	1.50	0.49	0.67	2.22	0.000*
FTA	0.33	0.47	0.00	1.00	1.000
CRISA	0.05	0.22	0.00	1.00	0.000*
POLITI	0.28	0.14	−0.02	0.53	0.000*
BOR	0.06	0.24	0.00	1.00	-

*Indicate significance levels at 1%; *p*-values are based on Levin-Lin-Chu unit root tests

Table A2. Descriptive statistics, 2005–2016.

Variables	Mean	Std. Dev.	Min	Max	Unit root test (*p*-value)
ln rFDI	17.71	2.65	0.00	21.94	0.000*
ln GDP (Vietnam)	25.44	0.20	25.10	25.76	0.469
ln GDP (Partners)	27.39	1.54	23.30	30.44	0.000*
ln DIS	8.41	0.82	6.77	9.50	–
ln rER	8.14	2.52	0.39	10.70	0.760
ln rIMP	20.50	2.28	11.30	24.42	0.000*
ln DIFF	−2.98	1.10	−4.65	0.05	0.001*
ln INFRA	7.86	0.11	7.76	8.07	1.000
HC	1.85	0.25	1.42	2.22	0.000*
FTA	0.39	0.49	0.00	1.00	1.000
POLITI	0.22	0.13	−0.02	0.48	0.000*
BOR	0.04	0.20	0.00	1.00	-

Table A3. Correlation matrix, 1997–2016.

	ln GDP (Vietnam)	ln GDP (Partners)	ln DIS	ln rER	ln rIMP	ln DIFF	ln INFRA	HC	FTA	CRISA	POLITI	BOR
ln GDP (Vietnam)	1.00											
ln GDP (Partners)	0.14	1.00										
ln DIS	0.00	0.65	1.00									
ln rER	0.02	0.20	0.45	1.00								
ln rIMP	0.50	0.03	−0.55	−0.32	1.00							
ln DIFF	0.16	−0.24	−0.60	−0.55	0.41	1.00						
ln INFRA	−0.22	−0.03	−0.00	−0.03	−0.15	−0.03	1.00					
HC	0.97	0.14	−0.00	0.03	0.50	0.15	−0.31	1.00				
FTA	0.16	−0.33	−0.54	−0.45	0.51	0.64	−0.05	0.16	1.00			
CRISA	−0.32	−0.17	−0.20	−0.14	−0.01	0.11	0.18	−0.31	0.06	1.00		
POLITI	−0.71	−0.10	−0.00	−0.02	−0.35	−0.12	−0.09	−0.68	−0.10	0.16	1.00	
BOR	−0.00	0.25	−0.17	0.01	0.27	0.49	−0.00	0.00	0.17	0.05	0.00	1.00

Table A4. Correlation matrix, 2005–2016.

	ln GDP (Vietnam)	ln GDP (Partners)	ln DIS	ln rER	ln rIMP	ln DIFF	ln INFRA	HC	FTA	POLITI	BOR
ln GDP (Vietnam)	1.00										
ln GDP (Partners)	0.06	1.00									
ln DIS	0.00	0.39	1.00								
ln rER	−0.05	−0.03	0.50	1.00							
ln rIMP	0.21	0.59	−0.32	−0.38	1.00						
ln DIFF	0.10	0.11	−0.56	−0.61	0.42	1.00					
ln INFRA	0.25	0.02	0.00	−0.02	0.03	0.02	1.00				
HC	0.89	0.05	−0.00	−0.04	0.18	0.09	0.02	1.00			
FTA	0.11	−0.16	−0.59	−0.49	0.29	0.56	−0.01	0.11	1.00		
POLITI	−0.59	−0.04	−0.00	0.03	−0.13	−0.06	−0.44	−0.55	−0.06	1.00	
BOR	−0.00	0.27	−0.17	−0.02	0.27	0.34	0.00	−0.00	0.27	0.00	1.00